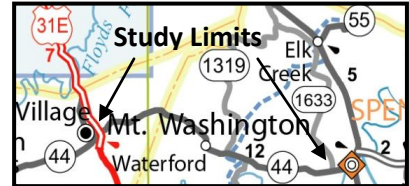


EXECUTIVE SUMMARY

KY 44 CORRIDOR STUDY US 31E to KY 1633 (Bullitt & Spencer Counties)

The KY 44 Corridor Study was conducted as a continuation to the planning studies undertaken by the Kentucky Transportation Cabinet (KYTC) from Shepherdsville in Bullitt County (Item 5-150.00) and extending eastward. The current planning study (Item 5-396.00) investigated the roadway conditions from US 31E in Mt. Washington to KY 1633 just west of Taylorsville.



KY 44 is a major highway corridor in Bullitt and Spencer counties. These counties have seen a notable growth in population (23% in Bullitt County and 45% in Spencer County) as well as traffic in the period 2000-2010. The goal of the planning study was to identify improvements to provide a safe roadway to this growing corridor.

PROJECT SCENARIO

US 31E, at the west end of the study corridor, connects to Gene Snyder Freeway to the north which leads to the City of Louisville. A traffic volume of 10,000 Average Daily Traffic (ADT) is noticed near US 31E



on KY 44 (2009 data) and is projected to increase to 24,500 ADT in 2035. A Level of Service F indicating breakdown flow, is projected in 2035 if the current road conditions remain

same in that section. To the east of the study corridor, KY 44 leads to Taylorsville Lake State Park which is a major recreational attraction with a 1,200 acres park and sits on 3,050 acre lake. There has been notable growth in recreational traffic on KY 44 in the study area due to the State Park.

EXISTING CONDITIONS

KY 44 is a 2-lane roadway with narrow shoulders in the study area. The west end of the study near US 31E has an elementary school, a high school, businesses and residences in Mt. Washington. Rear end crashes are high on KY 44 near US 31E. The terrain is fairly level between US 31E and KY 1319.

From KY 1319 going eastward, the terrain is rolling with several sharp curves and steep grades. There are no passing or climbing lanes. Intersections at the highway crossings at KY 1060, KY 1251 and KY 623 have inadequate sight distance, poor intersection geometry and some steep grades. There are multiple span concrete tee beam bridges east of the intersections at KY 1060 (on Plum Creek) and KY 1251 (on Elk Creek). Both the bridges are functionally deficient. There is a two span concrete culvert at Dutchman Creek which is also designated as a bridge. The bridges are not structurally deficient. The narrow width at the bridges is a concern particularly with recreational vehicles, trucks and farm equipment. There are several locations with high crash history. The common types of crashes from KY 1319 to KY 1633 are roadway departure crashes.



THE STUDY METHODOLOGY

Existing roadway information was collected from the KYTC's Division of Planning, Highway Information Systems (HIS) data. Additional project information was derived from archived plans and site visits. The study was divided into three segments, considering ongoing design projects in Segment 1 & 3. Segment 1 was defined between US 31E and KY 1319 where Item 5-347.50 has completed Phase I Design. Segment 2 was studied from KY 1319 to the beginning of the three lane section in front of Spencer County Elementary School. Segment 3 was defined from the end of Segment 2 to KY 1633 where Item 5-395.00 has completed Phase I and Phase II Design. Segment 2 falls in between Segments 1 & 3 which are in various stages of design as mentioned above. For consistency of design along the corridor, recommendations for Segment 2 will take into consideration, the proposed design in Segment 1 and Segment 3 on either sides of the segment. Therefore, all the three segments were included in a combined planning study under Item No. 5-396.00.

THE PROJECT TEAM

The project team consisted of KYTC Division of Planning Central Office staff, KYTC District 5 staff and KIPDA Transportation Planning staff. The project team's tasks were to evaluate the roadway conditions, analyze the current and future traffic, conduct periodic meetings to share information, gather input, develop a Draft Purpose and Need statement and to propose recommendations. The project team developed alternates with input from local Officials, stakeholders, and the public. The team had three meetings during the course of the study.

PUBLIC INVOLVEMENT

The project team considered public opinion to be very important, as the public are the users of the roadway on a daily basis and are best informed about the roadway conditions. Public input was requested during the study. Two Public Meetings were conducted which are documented separately in Public Meeting folders. The project team met the local Officials and stakeholders two times in formal meetings, initially to inform about the proposed study and later when the

alternates were developed. Public, Senators, Judge Executives, Mayors and stakeholders such as representatives of the schools, police, and fire departments of Bullitt and Spencer counties participated in the study and provided feedback.

DRAFT PURPOSE AND NEED STATEMENT

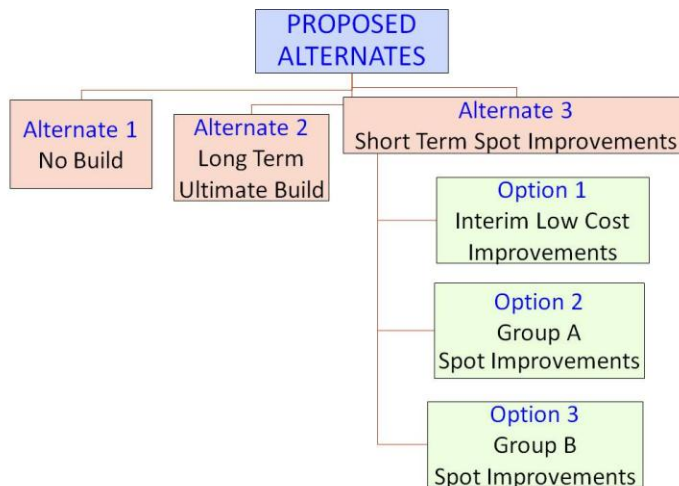
The purpose of the project is to improve the safety of the road and to provide adequate transportation linkage between the Cities of Mt. Washington and Taylorsville. Improvements to the study corridor were considered because of crash concerns, less than standard roadway geometry, and the need to provide an adequate transportation system for schools, commuters, emergency services and recreational traffic traveling to Taylorsville Lake State Park.

ENVIRONMENTAL OVERVIEW, GEOTECHNICAL REVIEW AND RESOURCE AGENCY INPUT

The Environmental Overview, which included addressing potential Environmental Justice issues, was completed by HMB Consultants Inc., as a separate study for the KYTC. The KYTC Division of Structural Design, Geotechnical Branch conducted a geotechnical review for the project. Selected State and Federal agencies were contacted to derive their input for the planning study.

ALTERNATES CONSIDERED

Alternates were developed considering the study purpose and need to improve the safety of the corridor. Three types of alternates were developed and presented to the public.



A. Alternate 1 - No Build Alternate

This alternate assumes that no new roadway improvements are undertaken. The benefits of this alternate are that the property, the environment and cost will be preserved. The disadvantage of selecting this alternate is that the safety issues identified by the study will not be addressed.

B. Alternate 2 - Long Term Ultimate Build Alternate

This alternate proposes a long term ultimate solution to KY 44 by upgrading the roadway to current geometric standards. Exhibit ES-1 shows the proposed Long Term Ultimate Build alternate. For Segment 1, recommendations outlined in the Phase I Design of Item 5-347.50 will be followed. Typical sections and alignment were defined in 5-347.50. A five-lane curb-and-gutter section is proposed from US 31E for 0.6 mile, then a three lane curb-and-gutter section for 0.3 mile. From that point to the end of the segment, a 2-lane rural section is proposed. Proposed speed varies from 45-55 mph.

In Segment 2, the project team proposed that the roadway will remain on the existing alignment where feasible. Realignment will be necessary at some locations to improve geometry. The proposed typical section consists of two 11 foot lanes and 8 foot shoulders (6 foot paved). Proposed design speed is 55 mph. Intersections will be improved. Climbing lanes & passing lanes may be added as needed depending on the proposed grades and turn lanes will be added. In Segment 3, recommendations of Item 5-395.00 will be followed. Alignment and typical section (22 foot pavement and 6 foot shoulders) were defined in 5-395.00. The proposed design speed is 45 mph.

C. Alternate 3 – Short Term Spot Improvements

No spot improvements were considered for Segment 1 as roadway improvements for this segment were identified in the Phase 1 Design under Item 5-347.50. Segment 3 is scheduled for construction in the near future and therefore, no spot improvements were considered. Three types of Short Term Spot Improvements were proposed for Segment 2 and are described below.

a. Alternate 3, Option 1 – Interim Low Cost Improvements

Some cost effective solutions that can improve safety are the interim low cost improvements such as center line and edge line rumble strips, chevrons around curves, reflectors on guardrails to improve night time visibility, cutting back slopes and installing high friction surfaces. District funds and highway safety improvement funds such as HSIP can be used to implement interim low cost improvements. Exhibit ES-2 shows some possible interim low cost improvements.

b. Alternate 3, Option 2 – Group A Spot Improvements

There are some locations in Segment 2 where the geometry does not meet the current design standards. There are several vertical grades that are substandard. Upon analysis of the crashes, many crashes were identified where roadway geometry does not meet current standards. Six of these locations were identified as Group A spot improvements. They are defined as projects in locations where roadway geometry is below current design standards and crash rate is higher (close to and more than 1.0). See Exhibit ES-3 for Group A projects.

c. Alternate 3, Option 3 – Group B Spot Improvements

At the public meetings and in the completed surveys, other locations that had driving concerns were discussed. The project team investigated the locations for the cause of

the concerns. The project team identified six locations with geometry problems and crash history and named them as Group B Spot Improvements. The crash and geometry concerns were less severe than Group A project locations. See Exhibit ES-4 for Group B projects. Cost estimates for all alternates are summarized in Table ES-1.

RECOMMENDATIONS

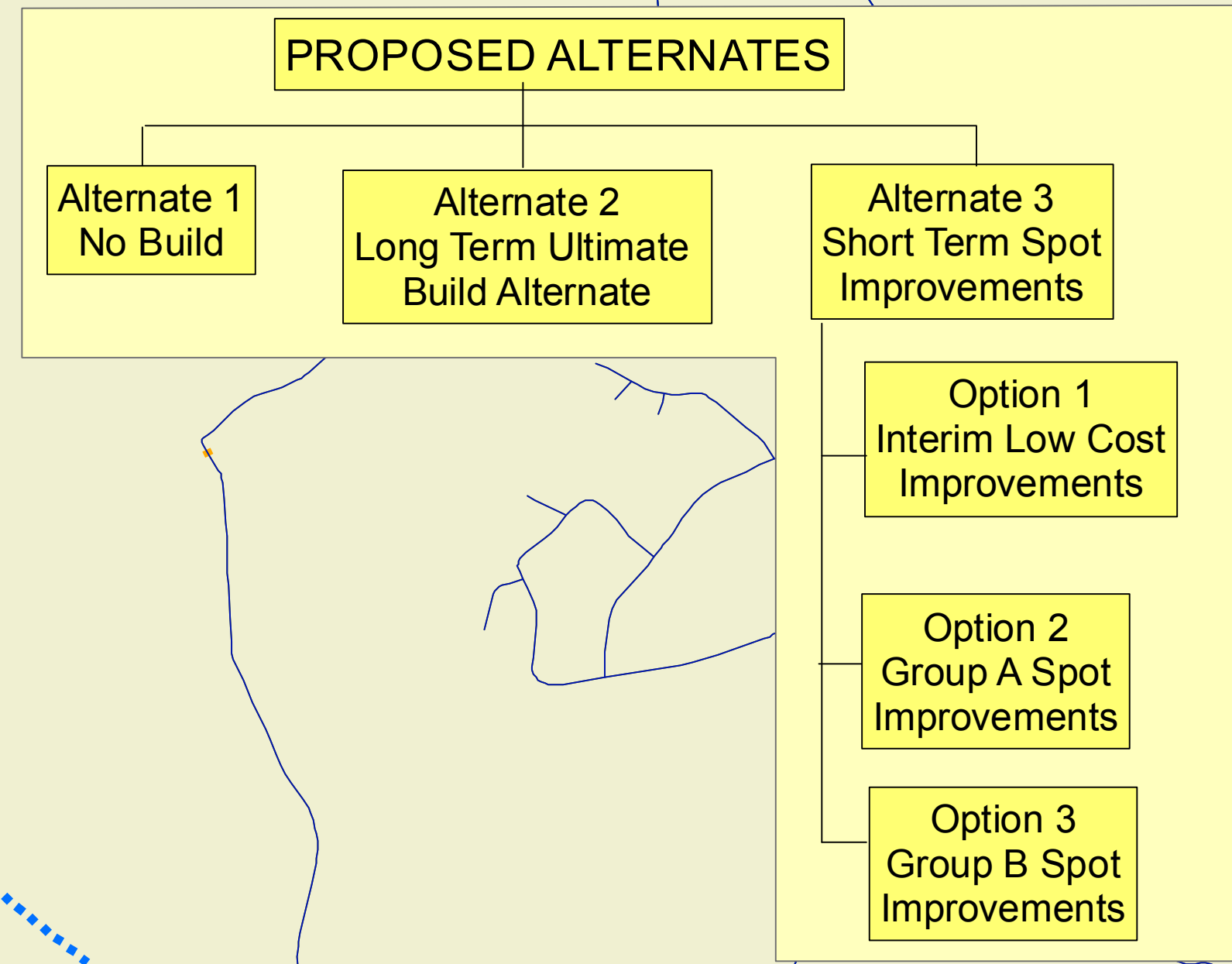
The Phase I Design for Segment 1 between US 31E and KY 1319 has recommended a five lane curb and gutter section at the west end of the study changing over to a three lane typical section ending just east of Parkland Trace. Considering the high traffic volumes and the large number of rear end crashes that currently occur and increase in projected traffic volume, these typical sections are appropriate for this section and are recommended. The Phase I Design also recommends an improved two lane section starting near Parkland Trace and ending at KY 1319 which will further improve safety in that section. It is recommended that Segment 1 continue with the advancement into Final Design.

Estimated cost to construct the Ultimate Build roadway for the 7.5 mile long Segment 2 from KY 1319 to the Spencer Elementary School is nearly \$71 million. As this is a significant amount to obtain funding, it is recommended that the roadway improvements should be phased. The most immediate and cost effective solution that can improve the safety of this segment is the interim low cost improvements. As identified, improving safety around sharp curves and installing edge rumble strips are some recommendations which are low cost and are effective in reducing crashes and in most cases can be completed using available maintenance and HSIP funds.

The next recommendation for Segment 2 is to undertake some of the spot improvement projects. The projects were grouped in two categories and their ranking was decided considering their geometry, crash history and public input. It is recommended these improvements should be designed keeping in mind the ultimate roadway section proposed in this study. In some cases, two spot improvement projects may be combined if they are close to each other and it may be desirable to design them at the same time. Combining two projects in this way will be more cost effective. When Segment 2 is programmed to build the ultimate build section, the typical section proposed in this study is recommended. The typical section proposes a two lane roadway with shoulders considering the truck and recreational traffic on this segment and also can accommodate bike traffic.

For Segment 3, the recommendations identified in Item 5-395.00 may be followed. Segment 3, which is from the east end of the three lane roadway in front of Spencer County Elementary School to KY 1633 was in the right-of-way acquisition stage at the time this study was conducted. The two lane roadway follows a new alignment and would improve the safety in this section with the new roadway geometry.

EXHIBIT ES-1: ALTERNATE 2 - LONG TERM ULTIMATE BUILD ALTERNATE



**SEGMENT 2
KY 1319 TO SPENCER COUNTY ELEMENTARY SCHOOL**

2-LANE RURAL TYPICAL SECTION



8' Shoulder (6' paved) | Two 11 Foot Travel Lanes | 8' Shoulder (6' paved)

- Segment 2 - Proposed Ultimate Build Alternate**
- Rebuild on existing alignment
 - Realign at some locations
 - Bridge Replacements to match new roadway
 - Intersections, Turn Lanes, Climbing Lanes

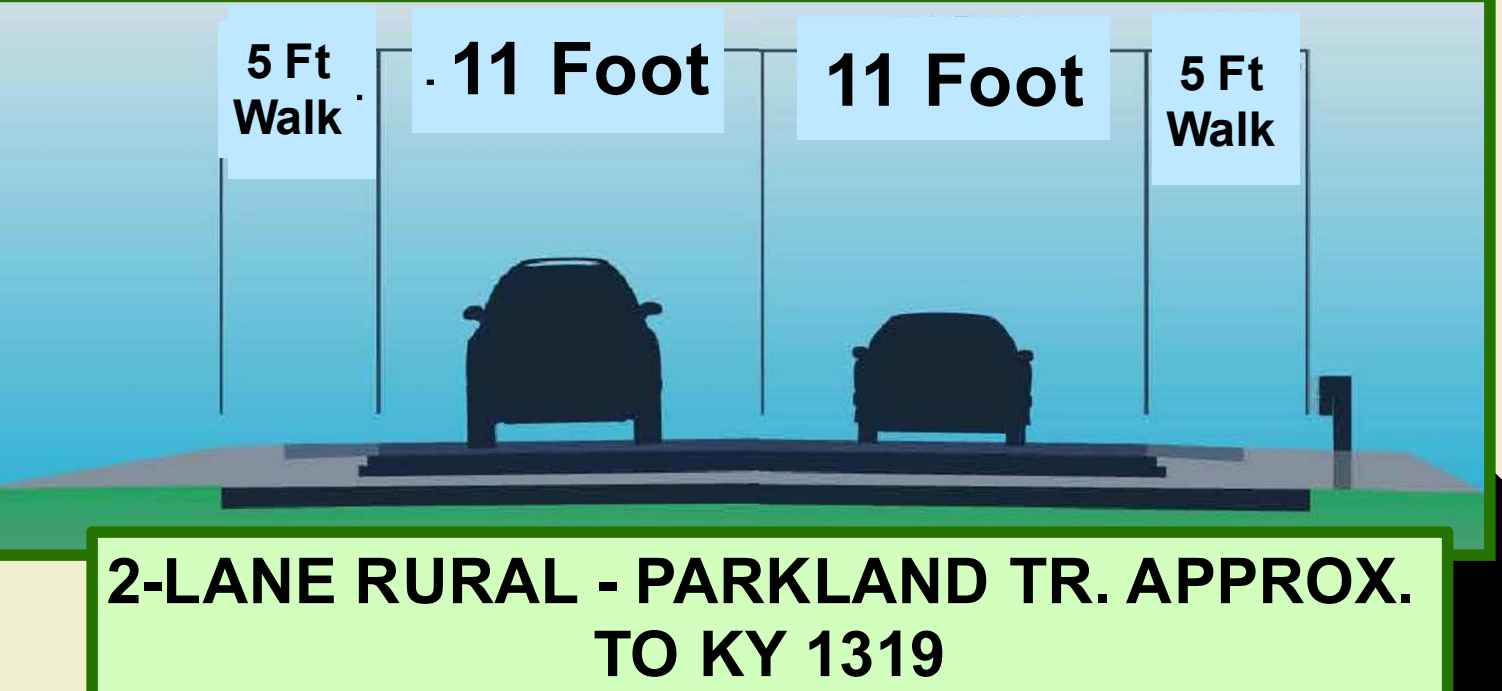
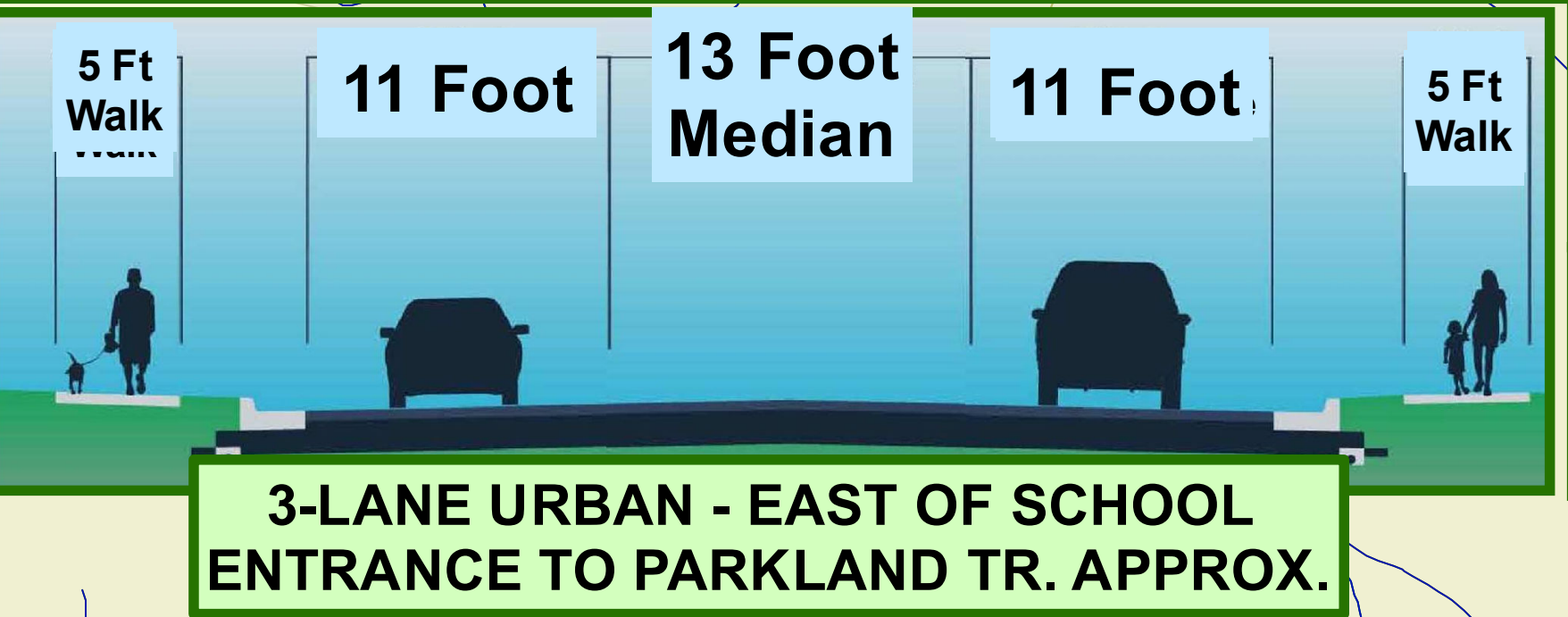
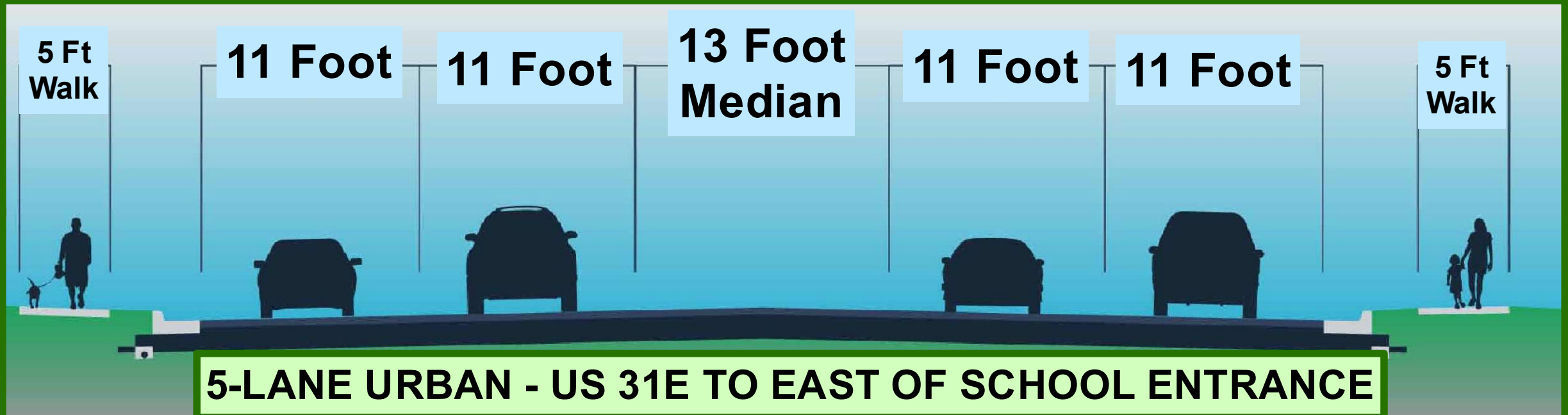
Possible Realignment Areas

**SEGMENT 1
US 31E TO KY 1319**

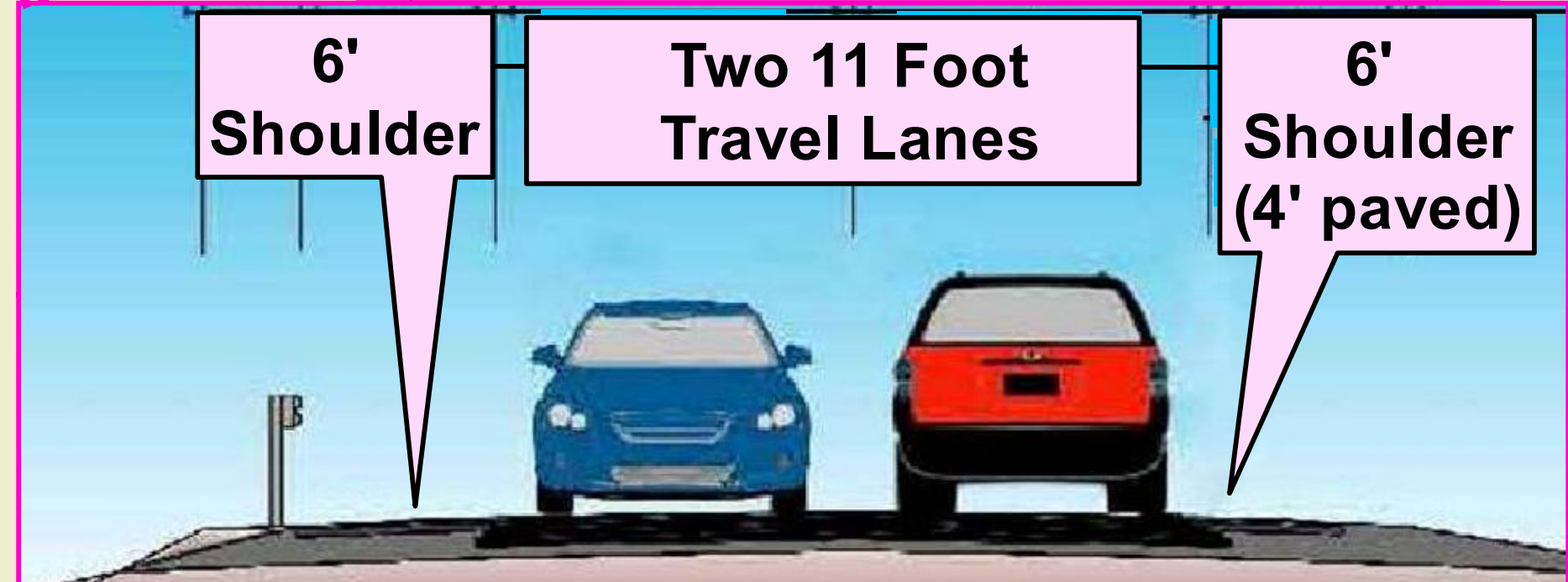
**2-LANE RURAL
PARKLAND TR. APPROX
TO KY 1319**

**5-LANE URBAN
US 31E TO EAST
OF SCHOOL ENT.**

**3-LANE URBAN
EAST OF SCHOOL ENT. TO
PARKLAND TR. APPROX.**



**SEGMENT 3
2-LANE RURAL TYPICAL SECTION**



SUMMARY OF ESTIMATED COSTS

SEGMENT 1	\$17,706,000
SEGMENT 2	\$70,550,000
SEGMENT 3	\$5,755,000
TOTAL COST	\$94,011,000

EXHIBIT ES-2: ALTERNATE 3, OPTION 1 - INTERIM LOW COST IMPROVEMENTS

PROPOSED ALTERNATES

- Alternate 1 No Build
- Alternate 2 Long Term Ultimate Build Alternate
- Alternate 3 Short Term Spot Improvements

Option 1 Interim Low Cost Improvements

Option 2 Group A Spot Improvements

Option 3 Group B Spot Improvements

ESTIMATED COST - \$500,000

INTERIM LOW COST IMPROVEMENTS
(Possible Treatment locations are shown here)

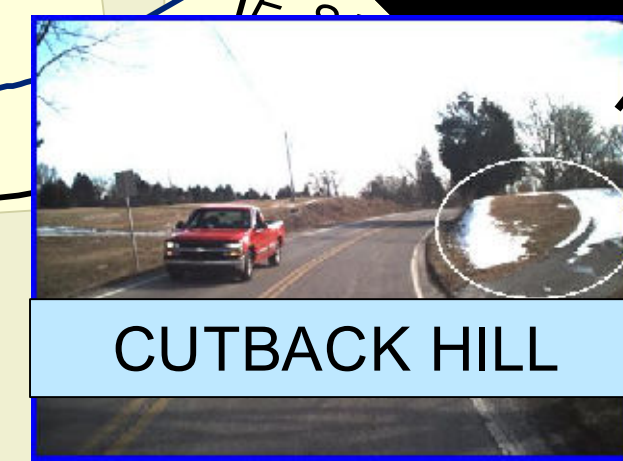
- * Edge Line Rumble Strips
- * Chevrons on posts
- * Cutback Hills
- * Tree Trimming/Removal
- * High Friction Surfaces
- * Reflectors on guardrail

LOW COST IMPROVEMENTS

- Rumble Strips
- Chevrons
- Reflectors on guardrails



TREE TRIMMING



CUTBACK HILL



CHEVRONS AROUND CURVES



REFLECTORS ON GUARDRAIL



CHEVRONS AROUND CURVES
(based on standards as needed)



HIGH FRICTION SURFACE
(Hunters Trace Curve)

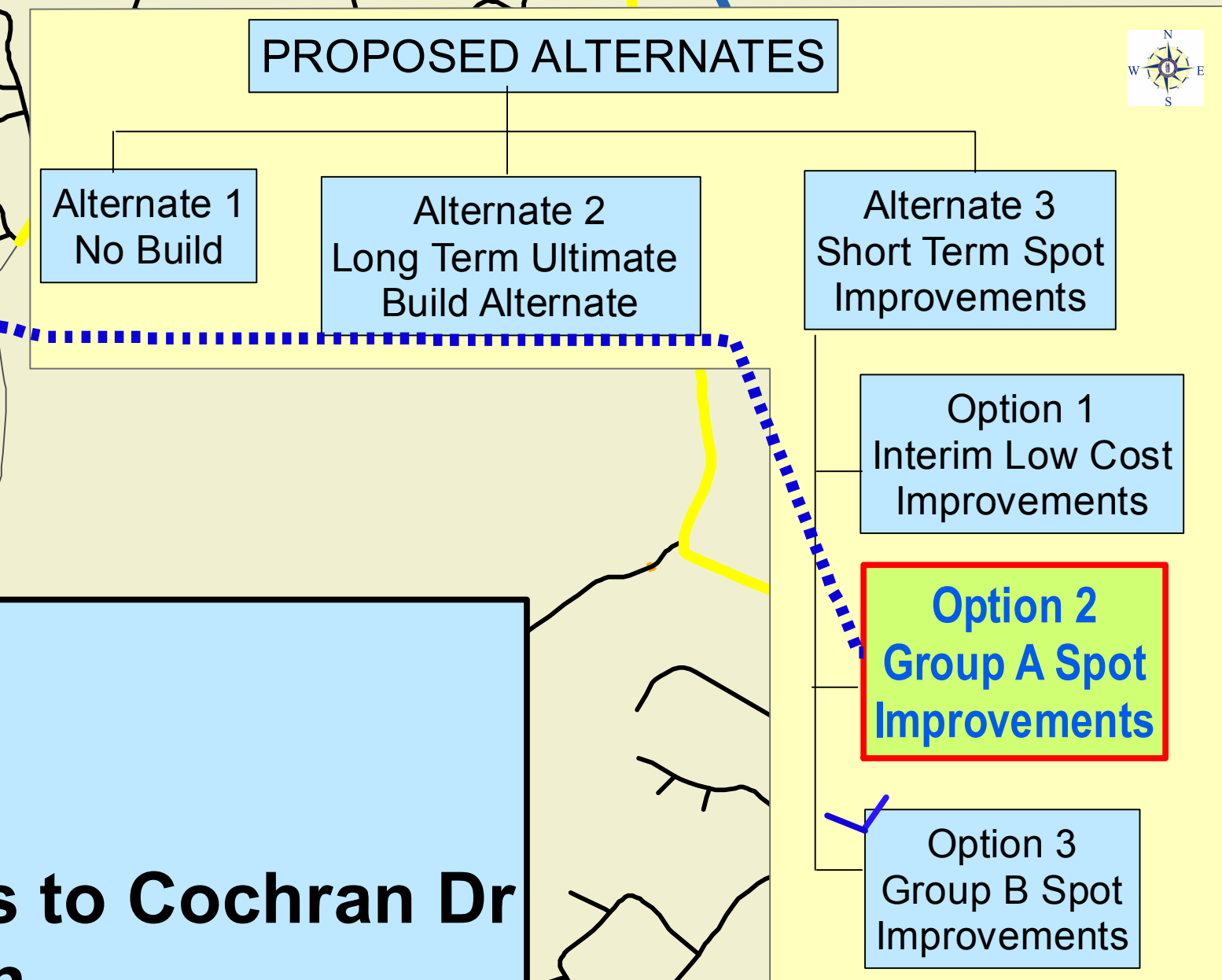


TREE TRIMMING
CUTBACK HILL

- Interstate
- Parkway
- US Highway
- State Road
- Local Road
- Bridge (Line)

NOT TO SCALE

EXHIBIT ES-3: ALTERNATE 3, OPTION 2 - GROUP A SPOT IMPROVEMENTS



Estimated Cost - \$3,830,000

Spot A1
East of Cedar Lake Dr to County Line
- Roadway Geometry Improvements



Estimated Cost - \$1,480,000

Spot A2 (Dutchman Creek Area)
- Improve West Horizontal Curve
- Intersection Improvements (Eliminate Skew on Side Roads & Align)
- Replace Bridge at Dutchman Creek



Estimated Cost - \$4,760,000

Spot A3 (Cochran Dr and East)
Intersection Improvements at Cochran Dr/Julia Ct
- Add Left & Right Turn Lanes to Cochran Dr East of Cochran Dr Intersection
- Roadway Geometry Improvements

Estimated Cost - \$2,380,000

Spot A4 (Junction KY 623 and East)
Jct KY 623 - Intersection Improvements
- Improve Turning Radius, Sight Distance etc.
Other Work:
- Replace Box Culvert (Possible Left Turn Lane to KY 623)
- Improve East Horizontal Curve



Estimated Cost - \$4,760,000

Spot A5
(Jct KY 1251 to Curve after Hunter's Trace Rd.)
Jct KY 1251- Intersection Improvements
- Improve Turning Radii, Sight Distance etc.
- Add Truck Climbing Lane West of KY 1251 East of Bridge at KY 1251
- Roadway Geometry Improvements



Estimated Cost - \$18,800,000

Spot A6 (Stumps Lane to Turnpike Ave.)
Minor Widening and Rumble Strips
- Widen pavement by 5 feet
- Install Center Line & Edge Line Rumble Strips



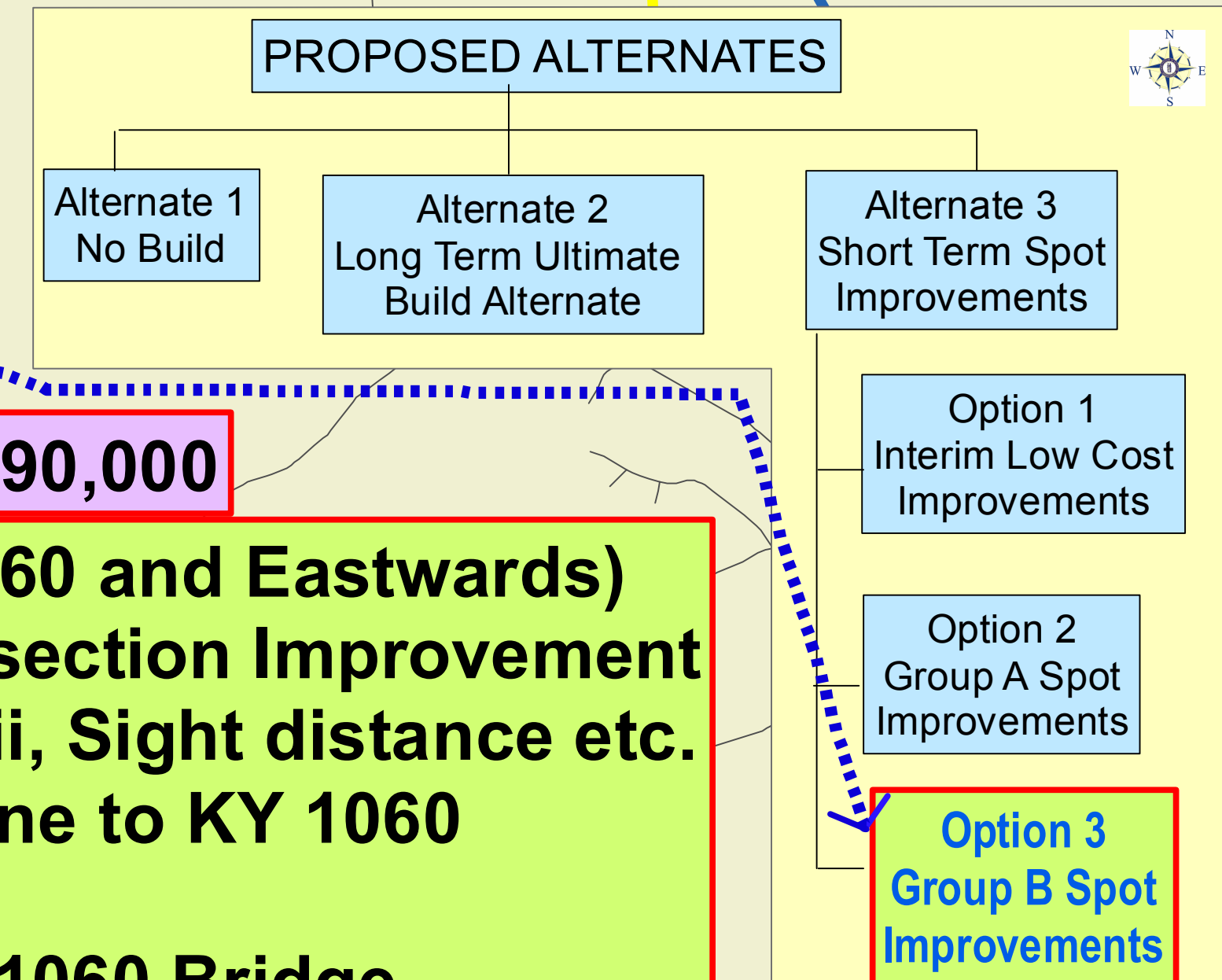
State Roadway System

- Rural Principal Arterial
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Urban Principal Arterial
- Urban Minor Arterial Street
- Urban Collector Street
- Local Road

NOT TO SCALE



EXHIBIT ES-4: ALTERNATE 3, OPTION 3 - GROUP B SPOT IMPROVEMENTS



ESTIMATED COST - \$2,040,000
Spot B1 (MP 0.70 to 0.95 Approx.)
 - Roadway Geometry Improvements
 - Add Truck Climbing Lane based on grade

ESTIMATED COST - \$2,380,000
Spot B2 (Village Dr/Hickory Woods Dr area)
 Curve East of Village Dr
 - Roadway Geometry Improvements
 - Village Dr Realignment
 Hickory Woods Dr Intersection
 - Add Left Turn Lane at Hickory Woods Dr

ESTIMATED COST - \$4,890,000
Spot B3 (Junction KY 1060 and Eastwards)
 Junction KY 1060 - Intersection Improvement
 - Improve Turning Radii, Sight distance etc.
 - Possible Left Turn Lane to KY 1060
 Waterford Park after KY 1060 Bridge
 - Add Left Turn Lane to the Park
 - Add Truck Climbing Lane after Waterford Park Entrance going East

ESTIMATED COST - \$3,970,000
Spot B4 (Akins Rd area)
 Akins Rd
 - Improve West Horizontal Curve
 - Add Left Turn Lane/Bypass Lane at Akins Rd
 - Flatten grade around MP 5.00

ESTIMATED COST - \$2,380,000
Spot B5
 Carl Monroe Rd./Benett Spur area
 - Roadway Geometry Improvements

ESTIMATED COST - \$6,010,000
Spot B6 (River Heights Blvd area)
 - Realign to eliminate multiple curves
 - Add Right Turn Lane & Left Turn Lane at River Hts Blvd.

State Roadway System

	Rural Principal Arterial
	Rural Minor Arterial
	Rural Major Collector
	Rural Minor Collector
	Urban Principal Arterial
	Urban Minor Arterial Street
	Urban Collector Street
	Local Road

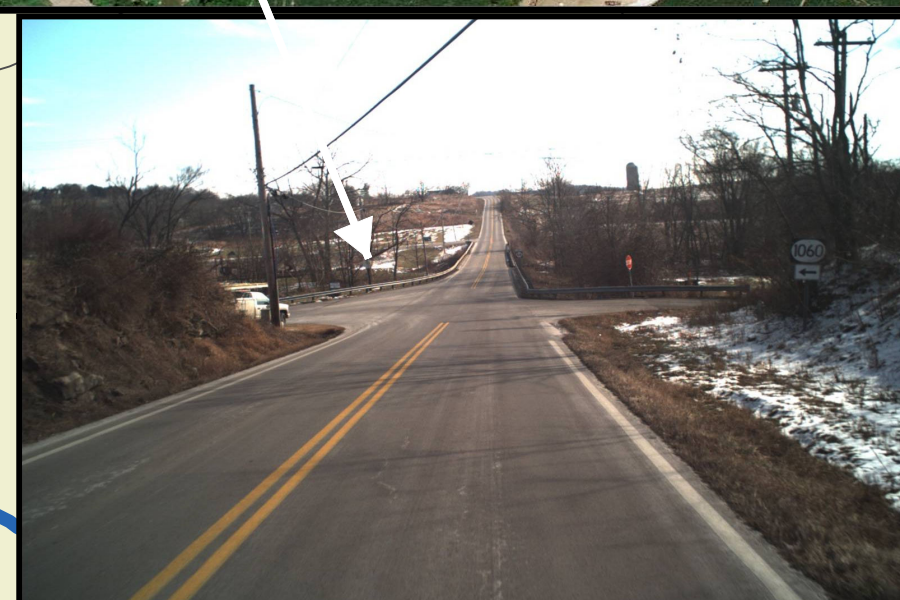
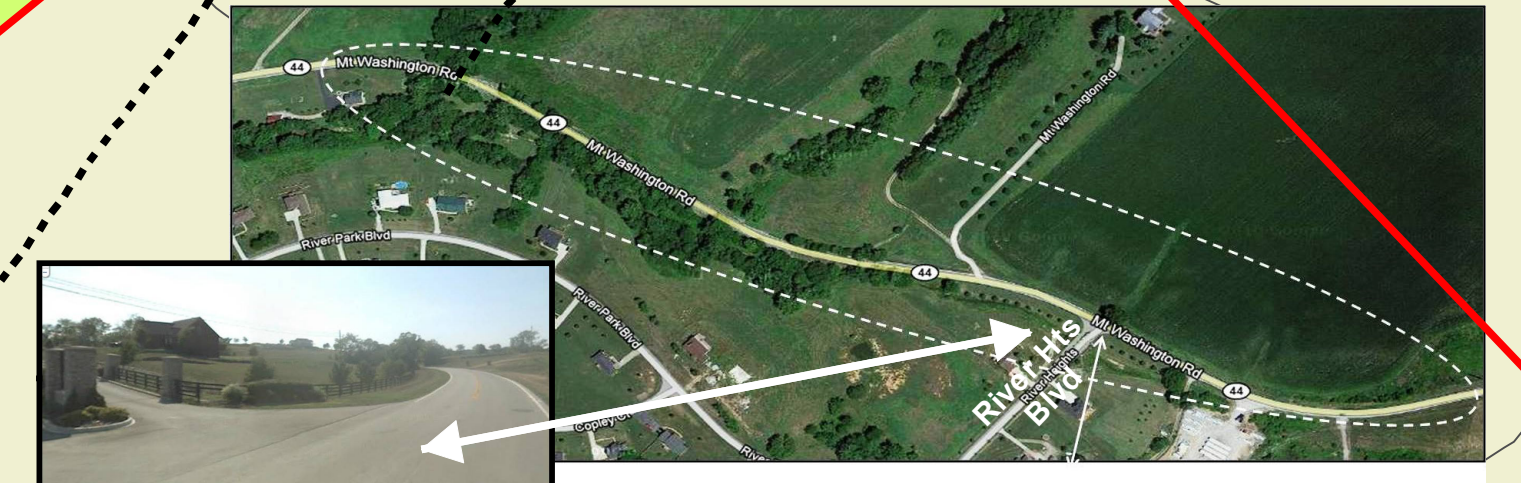
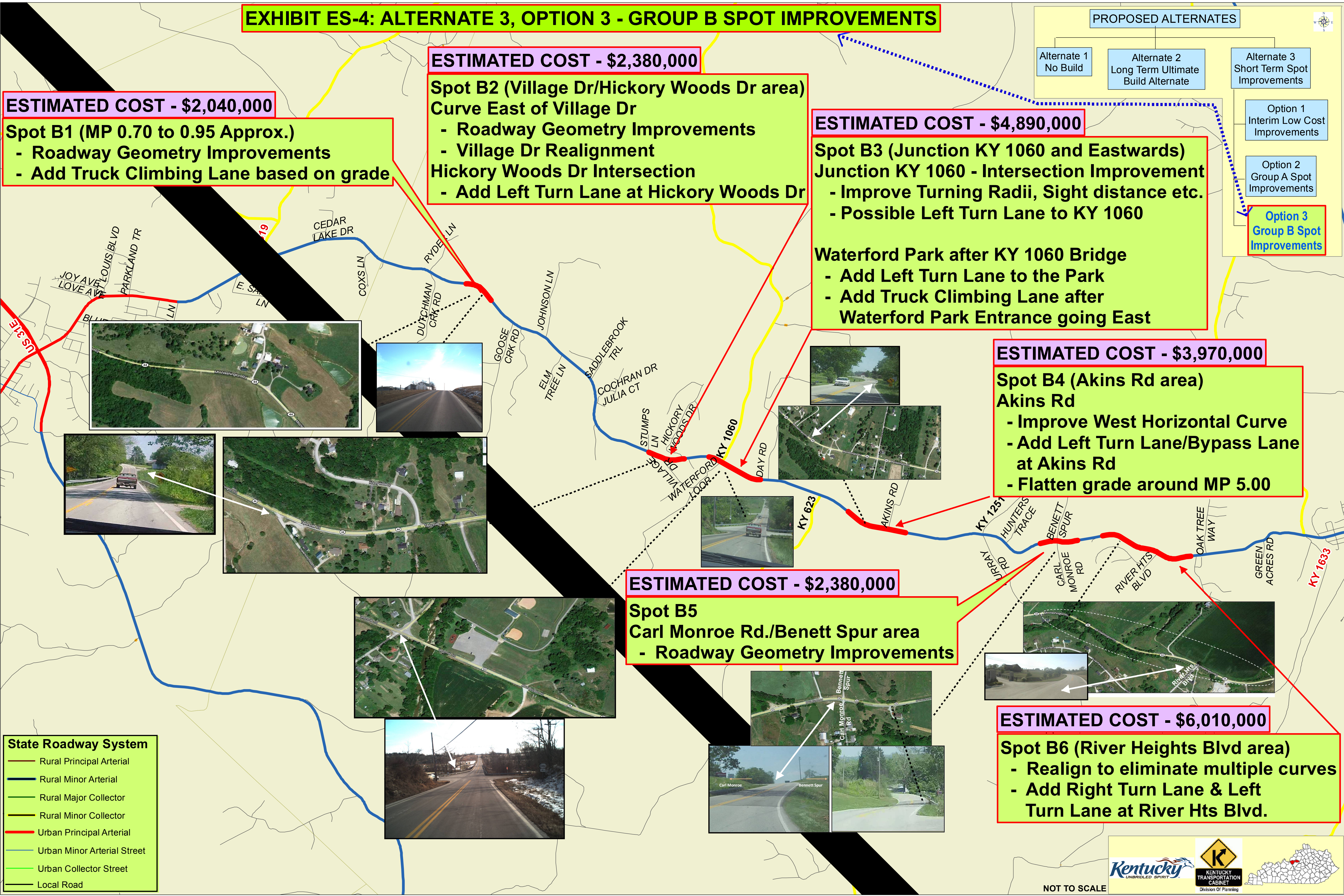


Table ES-1: Summary of Cost Estimates

ALTERNATE 1: No Build Alternate - \$0						
ALTERNATE 2: Long Term Ultimate Build Alternate						
Segment	Brief Description	Phase Cost (\$)				Total Cost (\$)
		Design	Right-of-Way	Utilities	Constr	
1	US 31E to KY 1319	\$3,000,000	\$2,300,000	\$1,606,000	\$10,800,000	\$17,706,000
2	KY 1319 to Spencer Co. Elem. School	\$10,150,000	\$8,270,000	\$7,020,000	\$45,110,000	\$70,550,000
3	Spencer Co. Elem. School to KY 1633	\$700,000	\$355,000	\$700,000	\$4,000,000	\$5,755,000
Total		\$13,850,000	\$10,925,000	\$9,326,000	\$59,910,000	\$94,011,000
ALTERNATE 3: Short Term Spot Improvements						
Option 1 : Interim Low Cost Spot Improvements						
Shoulder layback, tyregrip, cutback trees, reflectors on guardrail, chevrons, edge line rumble strips						\$500,000
Option 2: Group A Spot Improvements						
Spot	Location	Phase Cost (\$)				Total Cost (\$)
		Design	Right-of-Way	Utilities	Constr	
A1	East of Cedar Lake to County Line	\$560,000	\$460,000	\$410,000	\$2,400,000	\$3,830,000
A2	Dutchman Creek Area	\$220,000	\$160,000	\$150,000	\$950,000	\$1,480,000
A3	Cochran Dr and East	\$690,000	\$570,000	\$500,000	\$3,000,000	\$4,760,000
A4	KY 623 and East	\$350,000	\$280,000	\$250,000	\$1,500,000	\$2,380,000
A5	KY 1251 and Hunter's Trace Area	\$690,000	\$570,000	\$500,000	\$3,000,000	\$4,760,000
A6	Stumps Lane to Turnpike Ave.	\$2,700,000	\$2,200,000	\$2,000,000	\$11,900,000	\$18,800,000
Total		\$5,210,000	\$4,240,000	\$3,810,000	\$22,750,000	\$36,010,000
Option 3: Group B Spot Improvements						
Spot	Location	Phase Cost (\$)				Total Cost (\$)
		Design	Right-of-Way	Utilities	Constr	
B1	MP 0.70 to MP 0.95	\$290,000	\$240,000	\$210,000	\$1,300,000	\$2,040,000
B2	Waterford Loop to Hickory Woods Dr	\$350,000	\$280,000	\$250,000	\$1,500,000	\$2,380,000
B3	KY 1060 and East	\$760,000	\$460,000	\$410,000	\$3,260,000	\$4,890,000
B4	Akins Rd area	\$580,000	\$470,000	\$420,000	\$2,500,000	\$3,970,000
B5	Carl Monroe Rd/Bennett Spur Area	\$350,000	\$280,000	\$250,000	\$1,500,000	\$2,380,000
B6	River Heights Blvd Area	\$870,000	\$710,000	\$630,000	\$3,800,000	\$6,010,000
Total		\$3,200,000	\$2,440,000	\$2,170,000	\$13,860,000	\$21,670,000