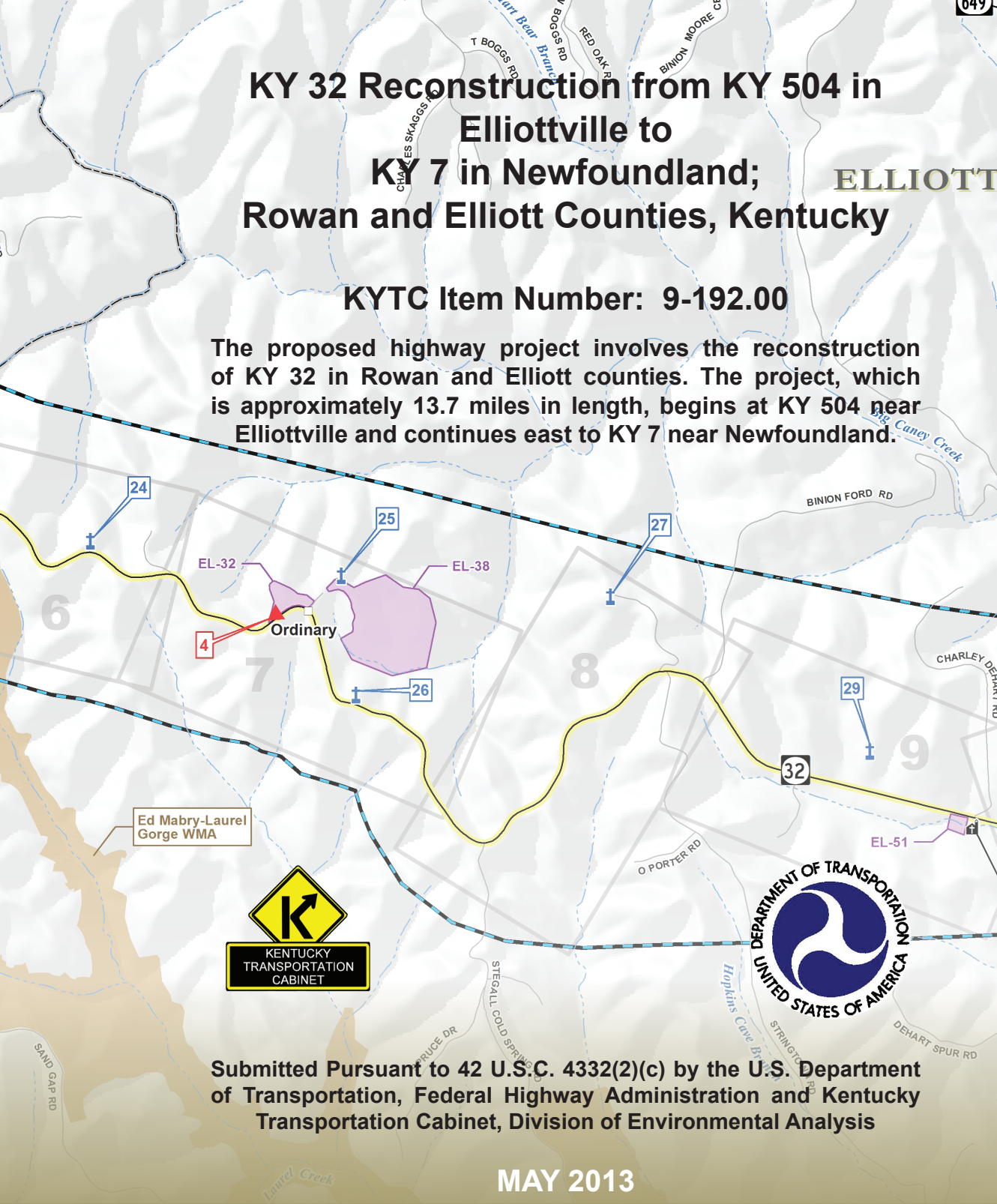


KY 32 Reconstruction from KY 504 in Elliottville to KY 7 in Newfoundland; Rowan and Elliott Counties, Kentucky

KYTC Item Number: 9-192.00

The proposed highway project involves the reconstruction of KY 32 in Rowan and Elliott counties. The project, which is approximately 13.7 miles in length, begins at KY 504 near Elliottville and continues east to KY 7 near Newfoundland.



Submitted Pursuant to 42 U.S.C. 4332(2)(c) by the U.S. Department of Transportation, Federal Highway Administration and Kentucky Transportation Cabinet, Division of Environmental Analysis

MAY 2013

Signed: June 27, 2013

ENVIRONMENTAL ASSESSMENT



PROJECT IMPACT PROFILE

Effective Date Pending

County: Rowan and Elliott Route: KY 32 Item No. 9-192.00

Type Project: (Describe) Reconstruction of KY 32 in Rowan and Elliott Counties Date: 5/24/13

Document (EA, FONSI, EIS, etc.) EA Date Approved: 6/27/13

Identify Preferred/Selected Alternate (indicate changes to alignment or design): Alternative 3

Reconstruction of KY 32 between Elliottville and Newfoundland on primarily new alignment

Provide an overview of the project impacts that will result (must be completed prior to each federal action).

IMPACTS	COMMENTS/EXPLANATION	IS THIS ISSUE RESOLVED? Y, N, OR N.I.*	FOLLOW THROUGH REQUIRED BY DEA & _____**				
			D	R	U	C	O
1. Air Quality <ul style="list-style-type: none"> Attainment status of project area. List TIP/STIP page & date. 	<ul style="list-style-type: none"> In compliance with KY State Implementation Plan for Attainment and Maintenance of NSAAQS Listed in FHWA-approved 2013 STIP on page 23 of 127 	N.I.					
2. Noise <ul style="list-style-type: none"> Is noise exceedance predicted? Is noise mitigation required? 	<ul style="list-style-type: none"> No NAC exceedances No noise mitigation warranted 	N.I.					
3. Aquatic Ecosystems <ul style="list-style-type: none"> Channel changes/culverts (total linear feet). Is stream mitigation required? Floodplain; FEMA no-rise certification. Wetlands (total acres mitigated). Is wetland mitigation required? Permits required (404, 401, Coast Guard). List dates of application/approval. 	<ul style="list-style-type: none"> No channel changes required Stream mitigation to be determined Not located in 100-yr. floodplain in Rowan County; No FEMA Flood Insurance Rate Maps for Elliott County, but is not considered a factor 1.45 acres of wetland impacts from preferred Alt 3; mitigation to be determined All permits will be obtained prior to construction. Individual 404 permit will be required for preferred Alt 3 BMP warranted to mitigate water quality impacts 	No (During Design, must consider USFWS and KDFWR mitigation recommendations)	✓		✓	✓	

* Indicate Y, N, or N.I. for Yes, No, or No Impacts.

** Follow through required by – Check D (Design), R (Right of Way), U (Utilities), C (Construction), or O (Operations).

<p>4. Threatened & Endangered Species</p> <ul style="list-style-type: none"> • USFWS coordination date(s). • Is a BA required? List species. • Seasonal restriction on BA fieldwork? 	<ul style="list-style-type: none"> • No response from USFWS; species list obtained August, 2012 • No Virginia big-eared, Indiana, or Gray bats were discovered during the survey, although potential habitat for all three occurs • Mitigation will be determined through coordination with USFWS during the BA process, if requested. • Any seasonal restriction unknown at this time 	<p>No (A BA will be performed prior to right-of-way and prepared in consultation with USFWS)</p>	<p>✓</p>		<p>✓</p>	<p>✓</p>	
<p>5. Section 106</p> <ul style="list-style-type: none"> • Consultation/coordination required (Native American, local, interested parties). • Archaeology; SHPO concurrence date. Identify sites that require additional work. • Historic structures/districts. SHPO concurrence date. • If there is an adverse effect, is a MOA required? 	<p><u>Consultation</u> Consulting Parties group established and meeting held on 5/24/12. Native American tribes potentially having an interest will be identified and invited to be consulting parties prior to archaeological investigations to be conducted for a build alternative</p> <p><u>Archaeological</u></p> <ul style="list-style-type: none"> • If a build alternative is selected, it will be subject to a full intensive inventory of sites and testing, where appropriate <p><u>Historic</u></p> <ul style="list-style-type: none"> • Preferred Alt 3, has No Effect at 4 sites and No Adverse Effect at 2 sites • SHPO letter concurring with determination of effects 10/4/12 	<p><u>Consultation:</u> N.I.</p>					
		<p><u>Archaeological:</u> No</p>	<p>✓</p>		<p>✓</p>	<p>✓</p>	
		<p><u>Historical:</u> Yes</p>					
<p>6. Section 4(f)</p> <ul style="list-style-type: none"> • List 4(f) resources impacted. • Is mitigation required? • Is Land & Water Conservation Act funding involved – 6(f)? 	<ul style="list-style-type: none"> • Due to the <i>de minimis</i> rule, there is no Section 4(f) use of historic resources. No other 4(f) resources impacted • No 6(f) resources impacted 	<p>N.I.</p>					
<p>7. Socioeconomic</p> <p>Number of relocations (residential, business, non-profit).</p> <p>Are there neighborhood or community impacts?</p> <p>Are there impacts to farmlands (AD1006 form)?</p>	<ul style="list-style-type: none"> • With preferred Alt 3, there are 15 residential displacements. No commercial or institutional displacements. • No neighborhood or community impacts • 3acres of Prime & Unique Farmland potentially affected by the preferred Alt 3. 	<p>No</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	
<p>8. Environmental Justice</p> <p>Is there a disproportionate impact to minority or low-income groups?</p>	<ul style="list-style-type: none"> • There is no disproportional impact to minority or low income groups 	<p>N.I.</p>					
<p>9. UST/Hazardous Materials</p> <p>Identify sites that require Phase II or III. (List parcel numbers & locations)</p>	<ul style="list-style-type: none"> • Phase II/III possible for: Natural Gas Pipeline, Trent's Grocery and McBrayer Grocery (both former UST sites) 	<p>No (Further investigation possible)</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	

* Indicate Y, N, or N.I. for Yes, No, or No Impacts.

** Follow through required by – Check D (Design), R (Right of Way), U (Utilities), C (Construction), or O (Operations).

10. Other impacts not previously discussed. <ul style="list-style-type: none"> • Is any additional mitigation required? • Are Special Notes required for this project? 	<ul style="list-style-type: none"> • No additional mitigation required • No Special Notes required 	N.I.					
---	--	------	--	--	--	--	--

Have there been any changes in regulations or laws since the last federal action for this project? If yes, describe: No

Comments and coordination:

Date(s) of Public Information Meeting(s) Public Meetings: Feb 17, 2011 and Oct 27, 2011

Prepared by:

Qk4, Inc., Louisville, Kentucky

Date:

May 24, 2013

* Indicate Y, N, or N.I. for Yes, No, or No Impacts.

** Follow through required by – Check D (Design), R (Right of Way), U (Utilities), C (Construction), or O (Operations).

ENVIRONMENTAL ASSESSMENT

KY 32 Reconstruction from KY 504 in Elliottville to KY 7 in Newfoundland; Rowan and Elliott Counties, Kentucky

KYTC Item Number: 9-192.00

The proposed highway project involves the reconstruction of KY 32 in Rowan and Elliott counties. The project, which is approximately 13.7 miles in length, begins at KY 504 near Elliottville and continues east to KY 7 near Newfoundland.

Submitted Pursuant to 42 U.S.C. 4332(2)(c) by the U.S. Department of Transportation, Federal Highway Administration and Kentucky Transportation Cabinet, Division of Environmental Analysis



**United States Department of Transportation
Federal Highway Administration**



Kentucky Transportation Cabinet

May 2013

**ADMINISTRATIVE ACTION
ENVIRONMENTAL ASSESSMENT**

**KY 32 Reconstruction from KY 504 in Elliottville to
KY 7 in Newfoundland; Rowan and Elliott Counties,
Kentucky**

KYTC Item Number: 9-192.00


The proposed highway project involves the reconstruction of KY 32 in Rowan and Elliott counties, Kentucky. The project, which is approximately 13.7 miles in length, begins at KY 504 near Elliottville and continues east to KY 7 near Newfoundland.

Submitted Pursuant to 42 U.S.C. 4332(2)(c) by the U.S. Department of Transportation, Federal Highway Administration and Kentucky Transportation Cabinet, Division of Environmental Analysis

Approved For Public Availability



Division Administrator
Federal Highway Administration



Director of Division of Environmental Analysis
Kentucky Transportation Cabinet

6/27/13
Date

6/27/13
Date


Recommended by


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APPENDICES

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1.0 PURPOSE AND NEED

The proposed KY 32 highway project involves providing a roadway having improved geometry compared with existing KY 32. Chapter 1.0 describes the project study area and history, identifies the existing roadway facilities, and defines the project's purpose and need.

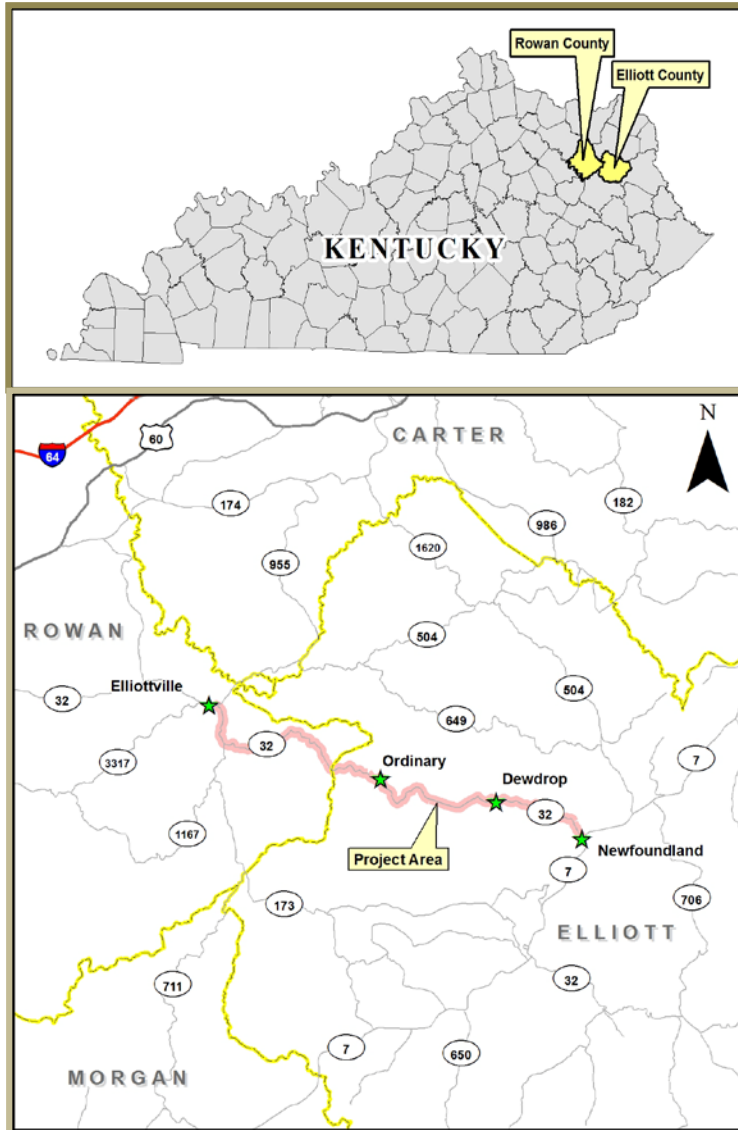


Figure 1 (top): Location Map
Figure 2 (bottom): Project Area

1.1 Project Setting and History

1.1.1 Elliott and Rowan Counties

KY 32 is a primary east-west roadway in Elliott and Rowan counties, in the mountainous region of northeastern Kentucky. The project corridor extends across the county line (see Figures 1 and 2). Both counties are within the Eastern Kentucky Coalfield physiographic region, and both are characterized by major topographical changes and rolling hills.

Adjacent Kentucky counties are: Carter, Lewis, Fleming, Bath, Menifee, Morgan, and Lawrence. West Virginia borders Lawrence County to the east. Two major recreational areas are within less than 10 miles of the study area—Grayson Lake State Park to the east and Daniel Boone National Forest to the west.

1.1.2 Project Corridor

The project corridor begins at KY 504 in Elliottville in Rowan County and continues eastward to KY 7 in Newfoundland in Elliott County, a distance of approximately 14 miles. KY 32 is known locally as Hogtown Hill Road in Rowan County, up to its intersection with KY 173, and then it is known as Brown Ridge Road.

Several build alternative alignments within the corridor are being evaluated as part of the environmental assessment process, described in Chapter 2.0. All alignments, except one, would incorporate existing KY 32 for a major portion of the project's length, and all would intersect state and local roads.

The Kentucky Tourism, Arts and Heritage Cabinet, the Kentucky Department of Travel, and the Kentucky Tourism Council promote the area's tourist and recreational attractions. In the project area, KY 32 provides access to Grayson Lake State Park, the Ed Mabry-Laurel Gorge Wildlife Management Area

(WMA), and the Daniel Boone National Forest. Within the Daniel Boone National Forest lie Cave Run Lake and Pioneer Weapons WMA.

1.1.3 Major Roads in the Project Area

Data on the existing conditions in the study area were taken from the KYTC Highway Information System (HIS) database. Table 1 (p.4) shows general route information for KY 32. Exhibit 1 shows the major roads in the roadway network together with selected land uses along the project corridor.

KY 32 is an east-west facility extending from Georgetown in Scott County to Louisa in Lawrence County at the West Virginia State Line. Within Rowan and Elliott counties, it begins at the Fleming County Line and extends eastbound through Morehead, the Rowan County seat and regional center; and then continues 39.8 miles to the Lawrence County Line. In the project corridor, KY 32 is an undivided road with two driving lanes varying in width from 9 to 11 feet, shoulder widths varying from 2 to 3 feet, and a posted speed limit of 55 miles per hour (mph). Within the study area, KY 32 is classified in the Kentucky Transportation Cabinet (KYTC) Functional Classification System as a Rural Major Collector and on the state system as a State Secondary (Other) roadway.

KY 173 in Rowan and Elliott counties is a north-south corridor that connects to KY 32 south of Elliottville at MP 17.797, then extends 10.6 miles south and connects with KY 7 south of Sandy Hook; thereby providing an alternate connection (other than KY 32) to KY 7. The existing KY 173 roadway is a two-lane undivided road with 9- to 10-foot-wide driving lanes, 2-foot-wide shoulders, and a posted speed limit of 55 mph. KY 173 is classified in KYTC's Functional Classification System as a Rural Major Collector, and on the state system as a State Secondary (Other) roadway.

Other Local Roads. Throughout the project corridor, approximately 20 roads intersect with KY 32 to provide access to rural residences and farmland. The following state routes intersect KY 32: KY 504 and KY 173 in Rowan County, and KY 7 in Elliott County. From north of Sandy Hook, past Newfoundland (the eastern terminus of the KY 32 project) to KY 885, KY 7 was reconstructed as a two-lane road by KYTC in 2002–2003.

1.1.4 Project History and Current Status

The need for improvements to KY 32 has been recognized by KYTC for some time. The *Kentucky Enacted Six-Year Highway Plan Fiscal Year (FY) 2006–2012* included the *KY 32 Alternatives Study* to consider the reconstruction of KY 32 between KY 507 at Elliottville and KY 7 at Newfoundland. The *KY 32 Alternatives Study, completed in 2009*, identified a purpose and need, traffic characteristics, environmental issues, cost estimates, construction considerations, and project recommendations.

Build recommendations consisted of an improved route in the vicinity of the existing alignment as well as lower cost, short-term spot improvements. Figure 3 depicts the recommended corridor in which future build alternatives should be located for study.

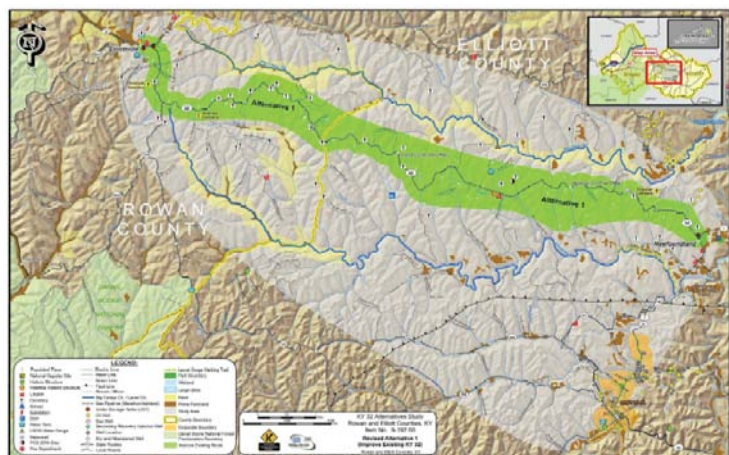


Figure 3: 2009 KY 32 Alternatives Study: Recommended Corridor

In the *Kentucky Six-Year Highway Plan FY 2010–2012*, funding was identified for design and right-of-way (ROW) phases for reconstruction improvements of KY 32. In 2012, the section of KY 32 between KY 504 at Elliottville and KY 7 at Newfoundland was added to the *Kentucky Six-Year Highway Plan FY 2012–2018*, enacted May 9, 2012, as follows:

County	Item No.	Route		Funding	Phase	Year	Amount
Elliott Rowan	2006 09-192.01	KY 32	Reconstruct KY-32 from KY-504 near Elliottville to KY-76 Near Newfoundland Milepoints: from 0 to: 8.656 Milepoints: from 16.619 to: 21.636 Purpose and Need: Reliability / Reconstruction	STP	D	2012	\$3.8M
	Parent No.:			STP	R	2013	\$6.0M
	2006 09-192.00			STP	U	2013	\$3.0M
				STP	C	2015	\$20.0M
					Total		

Public Involvement. The alternatives development and evaluation has been conducted in an open process, with various opportunities for public input. At the project initiation, a stakeholders’ meeting with state and local officials and other interested parties was held on January 27, 2011. The participants identified problems to be corrected, needs to be addressed by the project, and issues to be considered during the alternatives’ development and evaluation process. Additional stakeholders’ meetings were held on February 25, 2011, September 7, 2011, and November 1, 2012. Public meetings held on February 17, 2011, and October 27, 2011, consisted of presenting the project alternatives to citizens in the area. Attendees were afforded the opportunity to provide their suggestions and comments. More details about these meetings is provided in Section 5.0.

Current Status. KYTC has studied many possible combinations of alignments, coordinated with resource agencies, and held two public meetings to present the alternatives for review and comment. Based on environmental, engineering and design considerations, as well as on comments received from the public and agencies, four build alternatives and a No-Build Alternative were advanced for detailed evaluation in this Environmental Assessment (EA). The build alternatives are identified herein as Alternatives 1A, 1B, 2A, and 3. Chapter 2.0 describes the alternatives, summarizes the results of the evaluation process, and provides the rationale for recommending a preferred build alternative.

1.2 Purpose and Need, Goals

The KY 32 project would result in an improved section of a major east-west highway corridor through Rowan and Elliott counties in a rural section of northeastern Kentucky. The purpose and need for the KY 32 project are summarized as follows:

Purpose. To provide a roadway having improved horizontal and vertical geometry compared with existing KY 32 (see Figure 4).

Need. Existing KY 32 is a two-lane facility that was constructed in the early 1930s and has substandard geometry throughout most of its 13.7-mile-long corridor. The road is a primary east-west roadway in Elliott and Rowan counties, and provides connectivity among residential areas, the county seats, health services, educational institutions, and economic activity centers.

The project area’s topography is characterized by rolling terrain, with steep hills and valleys. KY 32 is constructed along a ridgetop and has numerous hills and curves. The existing conditions along the roadway corridor include:

- Substandard horizontal and vertical alignments (*i. e.*, steep slopes and sharp curves) throughout the corridor.
- Few opportunities to pass, and insufficient passing sight distance along 91% of its length.

- Narrow, asphalt pavement (9- to 11-foot-wide lane widths) throughout.
- Narrow (2- to 3-foot-wide) unpaved shoulders throughout most of the corridor.
- Predominant posted speed of 55 miles per hour (MPH) that is reduced to 25, 35, or 45 mph at multiple locations.

Table 1 provides route data that reveal the extent of the deficiencies indicating the need for improvements to the facility.



Figure 4: Alignment Deficiencies

Table 1: HIS Base Data Route Information

Route	Functional Class	Beginning Milepost (MP)	Ending MP	Posted Speed Limit	# of Lanes	Lane Width	% Passing Sight Distance*	ADT (2009) 2011	% Truck	Composite Adequacy Rating Percentile
Rowan										
KY 32	Rural Major Collector	16.619	17.797	55	2	10'	45%	(2,101)	6.4%	22.87
		17.797	18.489	55	2	10'	0%	798	6.4%	7.82
		18.489	21.636	55	2	10'	0%	(419)	6.4%	7.82
Elliott										
KY 32	Rural Major Collector	0.000	7.633	55	2	9'	10%	(437)	4.4%	54.17
		7.633	8.656	55	2	10'	10%	756	4.4%	54.17

* Percent Passing Sight Distance is the percent of segment length (estimated to the nearest 10%) that has available passing sight distance (as measured from the driver's eye to the road surface) of at least 1,500 feet.

NOTES: Yellow highlighting indicates less than desirable conditions.

Composite Adequacy Rating is a method being developed by KYTC to assess a roadway's condition and prioritize highway improvements. The ratings are calculated by individual functional class and based upon three roadway components (safety, service, and condition) with each component comprised of several measures. The rating scores 100 as a perfect, or near perfect, highway. The Composite Adequacy Percentile ranks a particular roadway section compared to other Kentucky roads in the same functional class into a percentile. For example, a road section with a composite adequacy percentile of 75.0 means that 25% of the roads are rated better. Composite adequacy data is from the 10-11-2011 update.

As noted in Table 2, based on current design standards, over 90% of the vertical curves (hills) do not meet 55 mph design speed, and approximately 85% of the horizontal curves do not meet 55 mph design speed. Likewise, there are many curves and hills that do not meet 45, 35, or even 25 mph design speeds, and many spots have a substandard curve on a substandard hill. The substandard geometry affects driving safety by reducing sight distances and restricting stopping or avoidance options when an obstruction in the roadway is encountered. Passing opportunities are limited to only one small stretch of the road, which adds to the safety problems.

Table 2: Summary of Existing Vertical and Horizontal Curves

	55 MPH	45 MPH	35 MPH	25 MPH
Existing Vertical Alignment Summary				
Number of Curves in Compliance	8	18	53	112
Number of Curves Non-Compliant	120 (93.8%)	110 (85.9%)	75 (58.6%)	16 (12.5%)
Existing Horizontal Alignment Summary				
Number of Curves in Compliance	21	43	85	134
Number of Curves Non-Compliant	115 (84.6%)	93 (68.4%)	51 (37.5%)	2 (1.5%)

Goals. In addition to the purpose and need to improve the horizontal and vertical geometry of the roadway, three goals of the project have been identified: improved safety, improved travel time, and the enhancement of scenic vistas.

1 Safety: During the 2009 Planning Study and at the January/February 2011 stakeholder/public meetings, safety was listed as the top concern. However, the available police crash data does not identify any specific places with statistically high crash rates along the corridor, nor does the data identify places having a notable frequency of crashes along the corridor. Therefore, improved safety, per say, is not a standalone element of the purpose and need; it is, however, a goal of the project. Some emergency responders have stated that, whenever possible, they will use an alternate route rather than KY 32 to avoid hazardous conditions (including narrow, curving roadway and poor stopping sight distance) and delays due to lack of passing opportunities. Overall, improved geometry would contribute to a solution to safety problems by reducing the potential for crashes, and would, thereby, address the top public concern.

2 Travel Time: A second goal of the project, based on input from the stakeholders and the public, is to improve travel efficiency within a corridor. Travel speed is currently below the posted speed limits on KY 32 due to the road's substandard horizontal and vertical alignments, short sight and stopping distances, narrow driving lanes and limited shoulder pavement, and low design speeds in some locations. Benefits to efficient travel within the corridor would include reducing traffic on local roads, particularly KY 173, by attracting traffic to the improved KY 32.

3 Scenic Vistas: A third goal of the project is to provide scenic vistas. As KY 32 is a ridgetop road, in certain locations the viewsheds from the road extend many miles to the horizon. The preservation and enhancement of viewsheds are seen as a value to the citizens and stakeholders, and a key element in local tourism.

1.3 Existing and Projected Traffic

Existing traffic volumes were obtained for the year 2012 (baseline year) and traffic projections were developed for 2035 (design year). This information was used to determine how KY 32 would function if no improvements beyond normal maintenance were made during that time period (i.e., the No-Build Alternative). A level of service analysis was conducted for the existing and projected scenarios. Table 3 presents the results of the traffic analysis. Exhibit 2 shows the existing (year 2012) and projected (year 2035) traffic volumes and percent trucks for the build and no-build scenarios.

2012 Traffic. As Table 3 shows, in 2012 the average daily traffic (ADT) on KY 32 through the project corridor ranged from 500 to 2,200 vehicles per day (vpd), with the highest volume (2,200) occurring at the beginning of the project corridor, in Section 1, between KY 504 and KY 173.

2035 Traffic. With Alternatives 1A, 1B, or 2A or the No-Build Alternative (i.e., no major construction activity on KY 32), traffic volumes are projected to range from 700 to 3,100 vpd—an approximately 41% increase in the Elliottville area and a 44% increase on KY 32 through the majority of the remaining corridor, including the Newfoundland area. With Alternative 3, traffic volumes are projected to range from 900 to 3,100 vpd—also an increase of 41% in the Elliottville area and a 67% increase on KY 32 through the majority of the remaining corridor, including the Newfoundland area. The projected increase in traffic volumes is primarily attributable to traffic being attracted from other area roadways to the improved KY 32.

Table 3 also shows the existing and projected level of service (LOS) for the corridor. Level of service is a qualitative measure of expected traffic conflicts, delay, driver discomfort, and congestion. Levels of service are described according to a letter rating system (similar to school grades) ranging from LOS “A” (free flow, minimal or no delays—best conditions) to LOS “F” (stop and go conditions, very long delays—worst conditions).

Table 3: Existing and Projected Traffic Volumes and Levels of Service

From – To	Existing			No-Build and Build Alternatives 1A, 1B, 2A			Build Alternative 3		
	2012			2035			2035		
	ADT	LOS	ADT % Trucks	ADT	LOS	ADT % Trucks	ADT	LOS	ADT % Trucks
KY 32*									
1. MP 16.6 (KY 504) – MP 17.8	2,200	B	5%	3,100	C	6%	3,100	C	6%
2. MP 17.8 (KY 173) – MP 19.3	900	A	5%	1,300	B	6%	1,500	B	6%
3. MP 19.3 – MP 5.2	500	A	5%	700	A	6%	900	A	6%
4. MP 5.2 – MP 8.6 (KY 7)	900	A	5%	1,300	B	6%	1,500	B	6%
KY 173	1,400	B	15%	2,000	B	15%	2,100	C	15%
KY 7									
South of KY 32	6,900	D	7%	9,700	D	7%	9,900	D	7%
North of KY 32	5,500	D	7%	7,700	D	7%	7,700	D	7%

Sources: Traffic volume and % trucks data for KY 32 are from the “Technical Report,” October, 2012. Traffic volume data for KY 173 and KY 7 are from Qk4 analyses. LOS data are from URS and Qk4 analyses.

* Numbers 1 – 4 identify analysis segments shown on Exhibit 2, “Traffic, Noise and Crash Data.”

The year 2012 LOS for KY 32 in the study area is an “A,” with the exception of the section near Elliottville, which rates LOS “B.” LOS levels anticipated for the build year (2035) are the same for all build and the no build alternatives. The 2035 ratings are projected to decrease one letter for each segment with the exception of Segment 3, which remains an “A.” This change may be attributed to increased traffic volumes, in the future as well as a 1% increase in truck traffic.

1.4 Safety/Crash Analysis

Crash and traffic data provided by KYTC were used to identify roadway sections with abnormally high crash rates, thus indicating a possible need for safety improvements. Crash analysis procedures involve assigning reported crashes to roadway locations by milepoint. The crashes are normally classified by severity into one of three categories: fatal, injury, or property damage only (PDO). Then, the average crash rates for roadway sections of various lengths are determined. Generally, the analysis includes analyzing the entire roadway length under study, followed by analyzing successively smaller roadway sections, especially those containing higher concentrations of crashes.

Roadway sections are classified as either “spots” (sections less than 0.30 mile) or “segments” (sections over 0.30 mile). Roadway section crash rates are normalized for comparison by either hundred-million-vehicle-miles traveled (HMVM) for segments, or millions-of-vehicles (MV) for spots. Using the average crash rate, the critical crash rate was obtained from Kentucky Transportation Research Center’s *Analysis of Traffic Crash Data in Kentucky (2008–2010)*. The “critical crash rate” is the maximum crash rate expected to occur on a roadway section, given the statewide average crash rate for that functional road class, the average daily traffic (ADT) volume, and the roadway section length. The ratio of these two rates (*i.e.*, the actual annual crash rate to the critical crash rate) produces a critical rate factor (CRF), or a measure of crash frequency for each segment or spot location. If the roadway section’s actual crash rate exceeds the critical rate (*i.e.*, the CRF is greater than 1.0), then that section is classified as a high crash location. Or, in other words, that roadway section has more crashes than is statistically probable in the absence of an unsafe condition(s).

For this study, crash data for KY 32 in the project area was analyzed for a three-year period, from calendar year 2008 to 2010. Tables 4a and 4b summarize the crash data.

The KYTC crash database for the study period listed 0 fatalities, 9 injuries, and 16 property-damage-only crashes. The traffic crash analysis for the project area indicates that five spot sections of KY 32 along the project corridor are each experiencing a CRF of 1.00 or greater. Table 4b lists these statistically high crash locations, which are illustrated in Figure 5. Poor/restricted visibility, speed differentials between vehicles, combined with a roadway not meeting current design standards, are the likely contributing factors for the high crash rates on KY 32. This assumption is supported by the documented poor visibility on these roadways, and 10% passing sight distances. Although the posted speed limit on KY 32 is 55 mph, these factors make driving at the posted speed unsafe and, in many locations, not practicable along most sections of the roadway in the project area.

Table 4a: KY 32 Segment Crash Analysis 2008–2010

County	KY 32 . . . From	To	Mile Point		Length (miles)	ADT ¹ (2009) / 2011	Lanes	Rural / Urban	Crashes				Crash Rates Per HMVM		Critical Rate Factor
			Begin	End					Fatal	Injury	PDO ²	Total	Total	Critical	
Elliott	Rowan - Elliott County Line	Gray Rd	0.000	7.633	7.633	(437)	2	R	0	5	5	10	222.328	398.696	0.573
	Gray Rd	KY 7	7.633	8.656	1.023	756	2	R	0	0	3	3	523.754	788.860	0.664
Rowan	KY 504	KY 173	16.619	17.797	1.178	(2,101)	2	R	0	2	4	6	157.900	413.540	0.382
	KY 173	Trent Ridge Rd	17.797	18.489	0.692	798	2	R	0	1	4	5	234.825	488.070	0.481
	Trent Ridge Rd	Rowan - Elliott County Line	18.489	21.636	3.147	(419)	2	R	0	1	0	1	69.375	373.081	0.186
TOTAL									0	9	16	25			

¹ Average Daily Traffic ² Property Damage Only

Table 4b: KY 32 Problem Crash Spots* 2008–2010

County	Mile Point		Length (miles)	ADT	Critical Rate Factor	Crashes			
	Begin	End				Fatal	Injury	PDO	Total
Elliott	0.357	0.557	0.2	521	1.00	0	0	2	2
	7.238	7.438	0.2	521	1.00	0	0	2	2
	7.763	7.963	0.2	521	1.00	0	0	2	2
Rowan	16.402	16.702	0.3	2798	1.16	0	1	6	7
	17.358	17.558	0.2	2800	1.06	0	1	4	5

* Where more than one length of spot was flagged at a given location, data is shown for the longest length

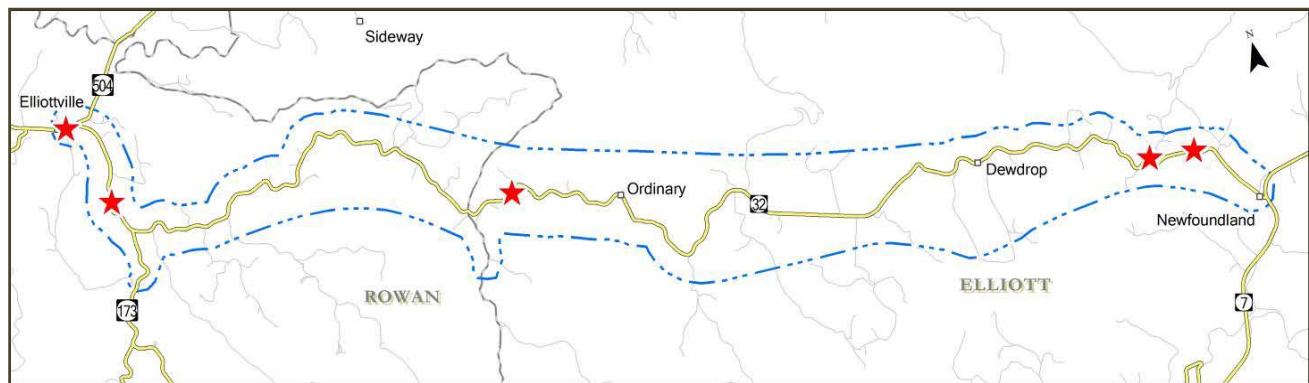


Figure 5: Crash Spot Locations

1.5 Project Termini

The project's proposed northern terminus is the intersection with KY 504 in Elliottville. The proposed project's eastern terminus, KY 7, was selected because it is a state road and shares alignment with KY 32 as it travels south to Sandy Hook. These termini match those identified in the 2009 *KY 32 Alternatives Study*, and have been coordinated with FHWA, KYTC, resource agencies, and stakeholders.

1.6 Schedule and Funding Sources

The proposed project is included in the state's 2012 Highway Plan (i.e., the *FY 2012–2018 Six-Year Highway Plan*, published May 2012) as two separate item numbers: 9-192.00 and 9-192.01. Design work is funded for FY 2012, the acquisition of right-of-way and utilities work are scheduled for FY 2013, and construction is scheduled for FY 2015. The funding for this project has been allocated from the Federal Statewide Transportation Program Funds (STP).

2.0 PROPOSED ALTERNATIVE CONCEPTS

2.1 Alternatives Considered

The identification and evaluation of alternatives were the most important and critical steps of the study. Alternatives that could meet the purpose and need for the project were identified and given consideration. Starting from a wide range of alternatives, the number of alternatives was reduced as more detailed information was collected and analyzed. Purpose and need, environmental factors, engineering feasibility, public comment, and cost were evaluated during the alternatives screening process. Alternatives considered in determining whether they met the purpose and need for the project included:

- A No-Build (“Do Nothing”) Alternative
- Rebuild the existing road either in total or in selected locations (“spot” improvements) (Alternatives 1A, 1B, and 2A)
- Build a road on new alignment within the same general roadway corridor (Alternative 3)

No-Build Alternative. The No-Build Alternative is one in which KYTC would take no action to improve the existing roadway. No residential displacements or commercial impacts would occur with the No-Build Alternative. Overall, however, selection of the No-Build Alternative would not meet the stated purpose and need of the proposed project. The No-Build Alternative would be expected to result in progressively deteriorating conditions for safe, efficient, and economical (time and money) vehicular traffic movement that would, in turn, impede improvement of the roadway. Selecting the No-Build Alternative would decrease mobility and fail to provide an adequate road. Public safety would continue to be a concern. The use of passenger vehicles, emergency vehicles, school buses, recreational vehicles, and large trucks forced to negotiate through the narrow lanes, sharp curves, and steep hills could result in elevated crash rates due to the encroachment of vehicles into opposing traffic. These negative impacts would translate to increased costs to drivers, which can lead to a lack of competitive and locational advantages and can impact opportunities for employment and economic development.

Rebuild the Existing Road. Improving existing KY 32 was recommended in the November 2009 *KY 32 Alternatives Study*. This approach consisted of an improved route on the existing alignment as well as lower cost, short-term spot improvements. Alternative alignments associated with this recommendation (i.e., Alternatives 1A, 1B, and 2A) are described herein in Section 2.2, *Build Alternatives Considered*.

Build Road on New Alignment. Also included as a project recommendation is a new roadway on new alignment within the existing project corridor. The alternative alignment associated with this recommendation (Alternative 3) is also described in Section 2.2.

2.2 Build Alternatives Considered

Because the No-Build Alternative would not meet the project’s purpose and need, build alternatives were developed that would reconstruct KY 32. The locations of the alternatives took into account several constraints within the study area, including historical resources with potential Section 106 involvement; natural resources such as wetlands, streams, and endangered species habitat; farmland and residential/commercial impacts; and engineering constraints related to correcting roadway geometry. The alternatives were presented to the public at a series of meetings. Based upon public input, environmental constraints, and potential environmental impacts, alignments were modified or eliminated, and the revised alignments were then presented at another series of public meetings. To date, two public meetings and four stakeholder group meetings have been held. Public involvement efforts during project planning and preliminary design will continue throughout the alternatives evaluation/recommendation process.

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The alternatives were presented to the public at a series of meetings. Based upon public input, environmental constraints, and potential environmental impacts, alignments were modified or eliminated, and the revised alignments were then presented at another series of public meetings. To date, two public meetings and four stakeholder group meetings have been held. Public involvement efforts during project planning and preliminary design will continue throughout the alternatives evaluation/recommendation process.

Build Alternatives Eliminated Early-On. Two alternatives (Alternatives 1 and 2) were eliminated from consideration earlier in the evaluation phase and have not been advanced to this point. However, a brief description of each follows.

Alternative 1 was a carryover from the 2009 *KY 32 Alternatives Study*. This alternative was a complete reconstruction of KY 32 from Elliottville to Newfoundland with two 12-foot-wide lanes and 6-foot-wide paved shoulders. This alternative was not designed to avoid or minimize impacts to natural areas, cemeteries, or residential relocations, but rather to reconstruct the existing KY 32 in place and conduct preliminary design on the recommended alternative from the 2009 planning study. The impacts of this alternative would be notably higher than those of the other alternatives. Specifically, it would require 87 residential relocations (out of 106 total residences along the corridor, which is 82%) and 18 cemetery relocations. At the October 27, 2011, public meeting, this alternative was opposed by the respondents more than any other. For these reasons, Alternative 1 has been eliminated from further consideration.

Alternative 2 would involve a symmetrical widening of the existing roadway based not on design speed but on the ability for long vehicles (trucks or school buses) to pass each other without encroaching into the adjacent lane. The existing horizontal and vertical conditions would be maintained through the corridor. The proposed road would include 11-foot-wide driving lanes and 2-foot-wide paved shoulders. Due to the impacts of this alternative, including approximately 65 residential relocations and 17 cemetery relocations, and the public opposition expressed at the October 27, 2011, public meeting, this alternative has been eliminated from further consideration.

Build Alternatives Advanced to the Environmental Assessment. Four build alternatives were advanced to the detailed alternative evaluation process presented in this Environmental Assessment: Alternatives 1A, 1B, 2A, and 3. Descriptions of each of the alternatives are provided below. The proposed KY 32 alternatives have intersections with state roads KY 504, KY 713, and KY 7; as well as with several local roads. With all alternatives, where loss of direct road (or, in many cases, driveway) access to proposed KY 32 would occur, access is restored via road realignment or relocation, frontage or backage roads, and/or new connectors.

Exhibit 3 (Sheets 3a and 3b) depicts the overall project corridor and build alternatives therein. Exhibit 4 (Sheets 1–14) shows the environmental constraints, including cultural historic and natural resources, encountered by or in the vicinity of each build alternative. Typical sections corresponding to the alternatives are depicted on Figures 6, 7, and 8.

It is important to note that widening a road that is located along a ridge, as is KY 32, requires fill rock and dirt to build up the foundation so it will support the widened road and provide adequate slopes for safety and drainage. Fill can be obtained either onsite, as is often the case where a road is to be constructed on

new alignment; or offsite, which is generally the case when a road is to be widened or reconstructed along its existing path. With regard to the KY 32 project, each of the build alternatives would require a substantial amount of fill material.

Alternative 1A is the implementation of the spot improvements, only, from the 2009 *KY 32 Alternatives Study*. The study's recommendation was to design these spots to have a 45-mph design speed. The preliminary engineering and environmental analysis phase is based on more detailed mapping and information than was available during the planning phases. As a result, the spot improvements were refined from ten spots to eight spots by combining some of the initial spots due to proximity and the ability to reconnect the spot with existing KY 32. Combined, the spot improvements would consist of reconstruction of approximately 4.7 miles of KY 32.

These refined spots would not address all of the geometric deficiencies along the roadway, most notably narrow lane widths and poor passing sight distance throughout the entire length of the corridor and not just at selected locations (see Table 1, p. 4). Therefore, Alternative 1A would not meet the project's purpose and need. However, because this alternative was recommended in the 2009 study and because public support for this alternative from the October 27, 2011, public meeting was high, this alternative was advanced for purposes of comparison with the other alternatives in this Environmental Assessment.

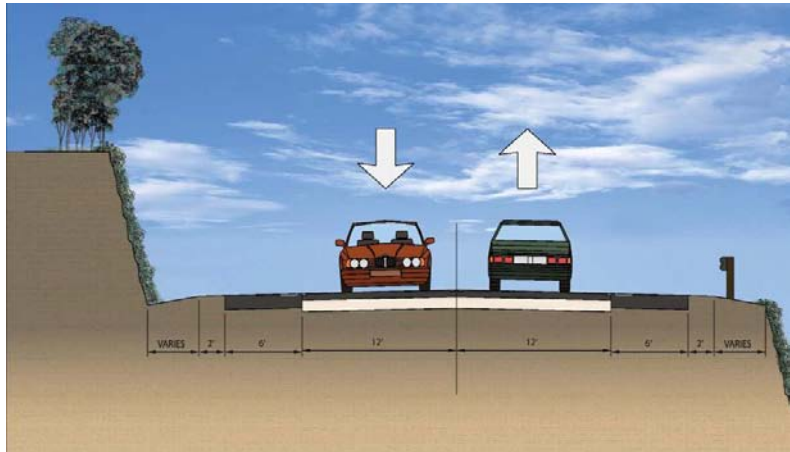


Figure 6: Typical Section for Alternative 1A and Sections of 1B—12' Lanes, 6' Paved Shoulders

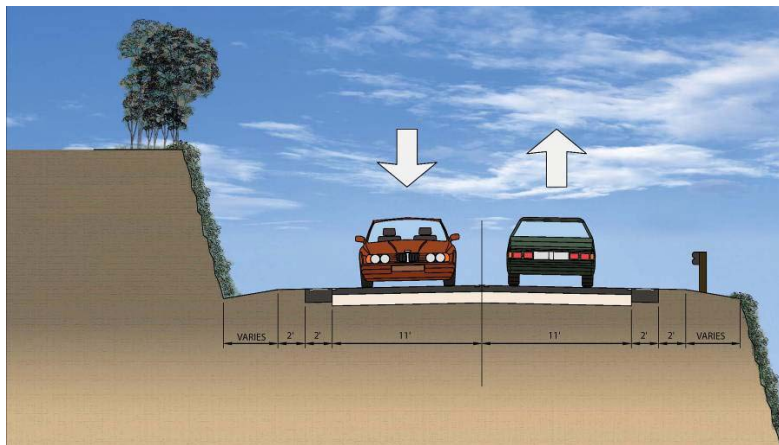


Figure 7: Typical Section for Alternatives 2A, and Sections of 1B—11' Lanes, 2' Paved Shoulders

Alternative 1B is the implementation of the spot improvements (which would have a 45-mph design speed) from the 2009 *KY 32 Alternatives Study* plus the reconstruction of the remaining KY 32 corridor with a 35-mph design speed. The spots would adhere to the recommended 45-mph design speed from the 2009 study, which include 12-foot-wide driving lanes and 6-foot-wide paved shoulders. The remainder of the corridor would adhere to the design guidelines of a 35-mph road and have 11-foot-wide driving lanes and 2-foot-wide paved shoulders, and would be approximately 13.1 miles in length. Due to this flexibility in design, the impacts of this alternative are less than those of Alternative 1A; therefore, this alternative was advanced for detailed evaluation in this Environmental Assessment.

Alternative 2A is a proposed reconstruction of the existing roadway at a 35-mph design speed from Elliottville to Newfoundland and would include 11-foot-wide driving lanes and 2-foot-wide paved shoulders, and would be approximately 13.2 miles in length. Although the overall public comments for this alternative were not supportive, the impacts are relatively low compared to some of the other alternatives; therefore, this alternative was advanced to the alternative evaluation process.

Alternative 3 is a proposed reconstruction of the corridor to 55-mph design speed, with 12-foot-wide driving lanes and 8-foot-wide paved shoulders. The design speed requires flatter horizontal and vertical curves when compared to the other alternatives. Due to the poor geometry of KY 32, this alternative would be mostly off the existing KY 32 alignment, but would use the existing alignment where feasible. Where this alternative would be on new alignment, it is within the recommended corridor identified in the 2009 *KY 32 Alternatives Study*. The alternative would be approximately 12.2 miles in length, which is about 1.0 mile less than Alternatives 1B and 2A; and would provide, where practical, scenic vista pullovers, which was a key request of stakeholders and the public.

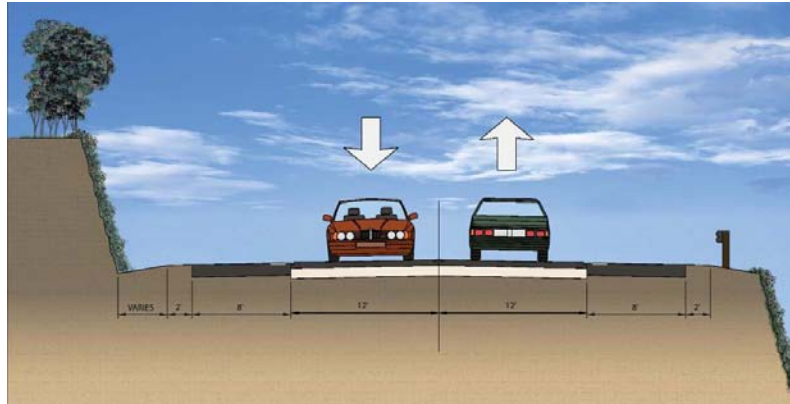


Figure 8: Typical Section for Alternatives 3—12' Lanes, 8' Paved Shoulders

Where this alternative would be on new alignment, it is within the recommended corridor identified in the 2009 *KY 32 Alternatives Study*. The alternative would be approximately 12.2 miles in length, which is about 1.0 mile less than Alternatives 1B and 2A; and would provide, where practical, scenic vista pullovers, which was a key request of stakeholders and the public.

Alternative 3 is the recommended preferred alternative (see Section 2.3). Considerations leading to the recommendation of Alternative 3 as the preferred alternative are summarized below. Table 5 (p.16) presents a summary matrix comparing the estimated costs and key potential environmental impacts of Alternatives 1A, 1B, 2A, and 3 described throughout Chapter 2.0.

2.3 Preferred Alternative—Build Alternative 3

2.3.1 Introduction

Based on the evaluation of alternatives and the public involvement efforts described throughout this Environmental Assessment, Alternative 3 is recommended as the preferred alternative. Alternative 3 is the only alternative that constructs a new roadway on new alignment throughout the majority of the project corridor.

2.3.2 Rationale for Recommending the Preferred Alternative

The proposed roadway would be on new alignment for almost its entire length. Although the existing road would continue to provide local access, it would no longer be the area's primary east-west route.

With purpose and need met by Alternatives 1B and 2A, the other criteria—social and environmental impacts, engineering and design feasibility/constraints, Section 106 and Section 4(f) requirements, and project costs—were employed to evaluate the alternatives. Considerations for the recommendation of Alternative 3 as the preferred alignment include:

- Best meets purpose and need.

- Received more public support than Alternatives 1B and 2A. In comments returned after the October 2011 public meeting (see Section 5.1, *Public Involvement Activities*), 58.1% favored advancing Alternative 3 further study vs. 36.4% for Alternative 1B and 25.5% for Alternative 2A. (As previously noted, there also has been substantial public support for Alternative 1A. For example, 65% of the comments submitted after the public meeting favored advancing Alternative 1A for further study. The alternative was advanced and is evaluated in this Environmental Assessment; however, it is not recommended because it does not meet the purpose and need of the project.)
- Is the only alternative primarily on new alignment; therefore, fill material would be obtained from borrow sites within the proposed right-of-way to be used in the road's construction, which is in contrast with the other three build alternatives. Specifically, material from hills within the proposed right-of-way would be removed and used to fill valleys within the proposed right-of-way; the fill would not have to be trucked in from locations offsite.
- Has second fewest residential relocations, no cemetery relocations, and best opportunity for scenic pullovers and other enhancements.

Note: Impacts to terrestrial and aquatic resources reflect anticipated impacts that will occur within the right-of-way of each alternative; therefore, impacts appear to be greater for Alternative 3 than those for Alternatives 1A, 1B, and 2A. These three alternatives, however, require fill material (3.0, 6.5, and 5.0 million cubic yards, respectively) from an offsite borrow location(s), and additional impacts at those locations, are not reflected in the impact calculations. The additional impacts to areas outside the rights-of-way of Alternatives 1A, 1B, and 2A cannot be quantified at this time because the location of the borrow site(s) will not be known until just prior to construction.

- Horizontal and vertical alignments will meet AASHTO and KYTC design standards.
- Is best for maintenance of traffic during construction.
- Is 1.0 mile shorter than Alternatives 1B and 2A and, at an estimated \$106 million, the alternative is the least expensive of the alternatives that extend the full length of the corridor. (Alternative 1A involves spot improvements, only, along 4.7 miles of the approximately 13-mile corridor, and was eliminated for not meeting purpose and need.)

Considerations related to other alternatives:

Alternative 1A. This is the only build alternative that **does not meet the purpose and need** of the project, primarily by the failure to effectively improve roadway geometry; however, it was advanced due to public support. This combination of spot improvements would require 15 residential relocations and one commercial displacement. It is the only alternative being considered that would have an Adverse Effect to and Section 4(f) use of a historic property. See Sections 3.10 and 3.11 for discussions of historic resources and Section 4(f) use, respectively. A high number of utilities would also be affected, and offsite (i.e., "borrow" site) fill material would be required. The estimated construction cost of this alternative is \$75 million.

Alternative 1B. This alternative would relocate 22 residences and 1 cemetery, and affect 3 potential hazardous materials sites. It would impact the most acres of open water (ponds) of all the alternatives, 3.42 acres. It would also impact 18,170 linear feet of streams and 0.75 acre of wetlands. A high number of utilities would also be affected, and offsite fill material would be required. This alternative would have the highest construction cost, estimated at \$200 million.

Alternative 2A. This alternative would relocate 12 residences and 1 cemetery, and affect 3 potential hazardous materials sites. It also impacts 1.59 acres of ponds. A high number of utilities would also be affected, and offsite fill material would be required. This alternative has the second highest construction cost, estimated at \$175 million.

For Alternatives 1A, 1B, and 2A, the fill material needed must be obtained from sites other than the state purchased right-of-way. The area of land that would be disturbed to obtain the material would depend on the depth of the site used. The potential impacts to offsite borrow location(s) cannot be quantified because the locations are not chosen until a project is let for construction. Figure 9 provides one scenario to illustrate how many acres of land could be impacted based on the depth of the material to be removed from the site. When offsite areas are required, obtaining and transporting the fill material to the construction site could have substantial environmental impacts.

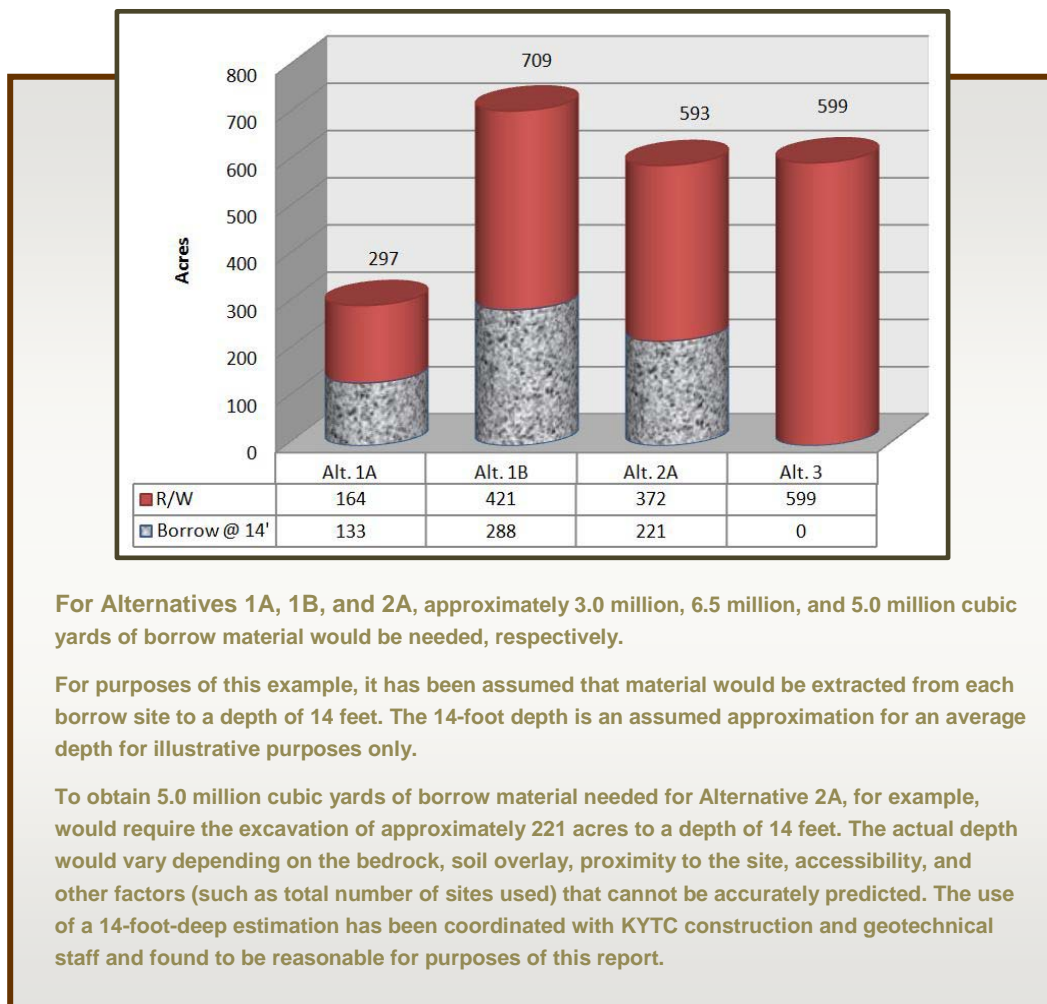


Figure 9: Acres of Right-of-Way and Borrow (Estimated)—Illustrative Scenario

Table 5: KY 32 Potential Build Alternative Impacts

Potential Impacts	Alternatives			
	Alternative 1A Spot Improvements from <i>Planning Study</i> at 45-mph design speed	Alternative 1B Spot Improvements + reconstruct rest of corridor at 35-mph design speed	Alternative 2A 35-mph design speed thru all of corridor; mostly on alignment	Alternative 3 55-mph design speed thru all of corridor; mostly off alignment
Meets Purpose and Need	NO	YES	YES	YES
Length (Miles)	4.7	13.1	13.2	12.2
Estim. Cost (2012, millions \$)				
Right-of-way	\$5	\$7	\$5	\$5
Utilities	\$5	\$10	\$10	\$1
Construction	<u>\$75</u>	<u>\$200</u>	<u>\$175</u>	<u>\$100</u>
Total	\$85	\$217	\$190	\$106
Relocations / Displacements				
Residential	18	20	14	15
Commercial	1	0	0	0
Air Quality	No air quality standard exceedance predicted. Project in compliance with SIP for attainment & maintenance of State and National AAQS.			
Noise Levels	No sties approach/ exceed NAC with existing or build conditions; no 3 dBA or greater increase compared to No-Build; no substantial (10 dBA) increase.			
Cemetery Relocations	0	1	1	0
Potential HAZMAT Sites	0	3	3	3
Aesthetic Impacts	Potential negative impact.	Potential negative impact.	Potential negative impact.	Potential negative impact. Best opportunity for pullover areas.
Streams (Linear Feet in right-of-way)				
Perennial	185	305	315	755
Intermittent	5,575	9,715	7,495	21,710
Ephemeral	<u>2,780</u>	<u>8,150</u>	<u>6,595</u>	<u>14,450</u>
Total	8,540	18,170	14,405	36,915
Open Water (Acres in right-of-way)	2.81	3.42	1.59	2.04
Wetlands (Acres in right-of-way)	0.62	0.75	0.55	1.45
Woodland (Acres in right-of-way)				
Mature Woods	61	166	141	318
Young Woods	<u>8</u>	<u>22</u>	<u>17</u>	<u>22</u>
Total	69	188	158	340
Historic Sites	NE at 5 sites	NE at 5 sites	NE at 5 sites	NE at 4 sites
Effect Determination*	AE at Site EL-26	NAE at Site EL-26	NAE at Site EL-26	NAE at EL-26 & 38
Section 4(f) Use	7.2 acres at EL-26	de minimis	de minimis	de minimis
Right-of-Way (Acres)	164	421	372	599
Fill Material Needed (Cubic Yards, estimated)**	3.0 million	6.5 million	5.0 million	7.0 million

* Effect Determination: NE = No Effect; NAE = No Adverse Effect; AE = Adverse Effect.

** For Alternative 3, the material would come from within the proposed right-of-way of the alternative, after the land has been acquired by KYTC. For other alternatives, the contractor would be responsible for obtaining the needed material at an offsite location that would be identified prior to the initiation of construction, should a build alternative be selected.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The environmental consequences of the project were as fundamental a concern in the planning process as function, safety, economy, etc. Identification of these consequences requires knowledge of the existing environment—natural, human social, and economic—and an awareness of local jurisdictions’ short- and long-term plans for land use within the study area. The following sections describe the natural, human social and economic environments—both current and, where applicable, projected—that would be affected by the build alternative alignments associated with this project:

3.1 Land Use	3.8 Aquatic and Terrestrial Ecosystems
3.2 Agricultural Lands	3.9 Permitting
3.3 Social and Economic Characteristics	3.10 Section 106 Resources
3.4 Relocations and Displacements	3.11 Section 4(f) and Section 6(f)
3.5 Environmental Justice	3.12 Hazardous Materials
3.6 Air Quality	3.13 Visual Impacts
3.7 Noise	3.15 Construction Impacts

The methods used to examine and evaluate potential impacts are those currently recognized by regulatory agencies and/or prescribed by FHWA and KYTC. Detailed, topic-specific information can be found in the supporting technical reports, which were prepared as separate technical studies and are on file with KYTC. Where applicable, the analyses address direct, indirect, and cumulative impacts, defined as follows:

Direct impacts are changes that happen in the same time and place as the proposed action.

Indirect impacts are those that are caused by the action and are later in time and further removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate (see 40 CFR 1508.8).

Cumulative impacts occur when the effects (both direct and indirect) of the action interact with the effects of other actions. The Council on Environmental Quality (CEQ) defines cumulative impacts as those that “result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7).

3.1 Land Use

Both Elliott and Rowan counties’ land uses are predominantly agricultural and rural residential, and the majority of the land that would be acquired by any of the build alternatives is currently used for one of those two purposes. The majority of the land along the existing KY 32 roadway is either agricultural, single-family rural residential, or undeveloped hilly and wooded areas. Isolated commercial developments occupy some parcels along the road, with businesses and community institutions and services located in the Elliott and Rowan county seats of Sandy Hook and Morehead, respectively. These communities are the economic activity centers in each county. Also located along KY 32 in Elliott County are the unincorporated, named communities of Ordinary and Dewdrop, at approximately mile points 1.6 and 4.8, respectively.

Table 6 summarizes the land use data by type and acreage within the rights-of-way of the build alternatives.

Table 6: Estimated Direct Land Use Impacts (Acres) by Build Alternatives

Land Uses	Total Acres in Study Area	Total Acres within Rights-of-Way			
		Alt. 1A**	Alt.1B	Alt. 2A	Alt. 3
Agricultural (excludes forestry) / Open Fields	542 ac.	80	207	171	238
Developed (includes residential, commercial, roads, utilities, etc.)	81 ac.	11	20.63	39.9	15.01
Woodlands (Mature and Young Woods)	599 ac.	69	188	158	340
Wetlands	2.58 ac.	0.62	0.75	0.55	1.45
Open Water (Ponds)	5.98 ac.	2.81	3.42	1.59	2.04
Streams	4.07 ac.	0.57	1.2	0.96	2.5
Total Acres	1,234.63 ac.	164	421	372	599

Source: Ecological Assessment Report (August 10, 2012).

* Impacts for Alternatives 1A, 1B, and 2A do not include impacts at borrow area(s), which would be outside the right-of-way in an as-yet-to-be-determined location(s). No borrow outside the right-of-way is required with Alternative 3.

** Alternative 1A would provide spot improvements, only; therefore, impacts are considerably less than those associated with the other alternatives, which extend the full length of the project corridor.

3.1.1 Principal Land Uses in the Project Area

Agricultural Uses. Agriculture, including timber production, is the predominant land use in Elliott and Rowan counties. According to the 2007 Census of Agriculture (the latest census available), there are 448 farms in Elliott County, comprising 66,843 acres harvested (approximately 44% of the county’s area); and there are 386 farms in Rowan County, comprising 49,963 acres (approximately 27% of the county’s area). The 2007 census reported that the average farm size in Elliott County was 149 acres (up from 131 acres reported in the in 2002 census) and the average farm size in Rowan County was 129 acres (up from 117 acres reported in the in 2002 census). Section 3.2 provides a discussion of potential effects of the project on agricultural land.

Residential Uses. The project area consists primarily of a limited number of dispersed single-family rural residential dwellings (frame structures and isolated residences). Many residences are located along KY 32, and there are a few small, loosely-based groupings of residences along local roads (see discussion in Section 3.3.2, subsection *Areas of Community Cohesion*). Some dwellings can be classified as residential farms. Section 3.4, *Relocations and Displacements*, includes a discussion of potential residential relocation impacts as a result of the project.

Commercial and Industrial Enterprises. Most of the commercial and industrial activity in Elliott County is located in or near the county seat of Sandy Hook. Most of the commercial and industrial activity in Rowan County is located in or near the county seat of Morehead. In the project corridor there are only a few small retail and no industrial establishments. Section 3.4 presents a discussion of potential commercial displacements as a result of the project.

Institutional Uses. In the context of this document, an institution is an established organization dedicated to public service or culture, such as churches, schools, hospitals, government or social service agencies, museums, libraries, etc. Institutions in or serving the project area and potential benefits or impacts as a result of the project are summarized below. Section 3.3.2, subsection *Community Resources*, identifies potential effects of the project on these facilities/community services.

Schools—No schools are located in the project corridor; however, KY 32 is a school bus route.

Churches—Two churches are along KY 32: Elliottville Baptist Church in Elliottville near the intersection of KY 504; and Concord Enterprise Baptist Church in Elliott County, approximately 4 miles from the KY 7 intersection.

Health Care and Emergency Services—The area’s health care and emergency medical facilities are in Morehead, outside the study area.

Other Institutions—The Little Sandy Correctional Complex is outside the project area on KY 7, east of Newfoundland in Elliott County.

Parks, Recreational Areas, and Wildlife Management Area. The following public parks and recreational areas, and a wildlife management area are located near the project study area. The potential for impacts to these areas as a result of the project are addressed in Section 3.3.2; and they are discussed further in Section 3.11.1, *Section 4(f)* (which includes Figure 12 [p. 53] showing their locations).

Grayson Lake State Park is located in both Elliott and Carter counties and encompasses the 1,500-acre Grayson Lake. The state recreation park also features a marina with boat rentals, boat ramp, an 18-hole golf course, theater, camp grounds, picnic area, and hiking trails.

Daniel Boone National Forest, operated by the U.S. Department of Agriculture’s (USDA), Forest Service, encompasses a large part of Rowan County and extends all the way to the Tennessee state line. Located within the northern most portion of the Daniel Boone National Forest is the 8,270-acre Cave Run Lake. Built by USACE for flood protection, Cave Run Lake is a popular site for boating, fishing, camping, and hiking. Daniel Boone National Forest sees over 5 million visitors a year.

Ed Mabry-Laurel Gorge Wildlife Management Area (WMA) is located in Elliott County. The northern tip of the WMA is adjacent to the existing KY 32 right-of-way. The WMA stretches from cliff line to cliff line, making it a long, narrow piece of rugged property. Laurel Creek, which flows through the gorge, averages 15 to 20 feet wide. Owned by the Kentucky Department of Fish and Wildlife Resources (KDFWR), it is 698 acres and open for fishing, hunting, and trapping. Laurel Creek supports a variety of species including rainbow trout and brown trout stocked by KDFWR. The WMA was dedicated in 2009.

3.1.2 Compatibility With Regional and Community Plans

Area Development Districts. Rowan County falls under the jurisdiction of the Gateway Area Development District (ADD) and Elliott County falls under the FIVCO ADD. There are no current land use plans, or development controls such as zoning ordinances or subdivision regulations (with the exception of the City of Morehead) for the rural areas of Rowan County or Elliott County. It is anticipated that most, if not all, future development would be located along KY 32 and in or around the communities of Elliottville and Newfoundland, at the north and south termini of the project corridor.

Kentucky Transportation Cabinet. KYTC has included the KY 32 reliability/reconstruction project in its *Six-Year Highway Plan FY 2012–2018* as Items 9-192.00 and 9-192.01. The state scheduled design work for both project numbers for FY 2012, right-of-way acquisition and utilities work for FY 2013, and construction for FY 2015 (see Section 1.1.4, *Project History and Current Status*, for details). There are no other major projects programmed in the 2012 Highway Plan near the KY 32 project in Rowan County.

In Elliott County, the 2012 Highway Plan includes reconstruction of KY 7 in two locations: south of Sandy Hook for 7 miles to Morgan County (KYTC Item No. 9-228), and north of KY 885 for 5 miles to Carter County (KYTC Item No. 9-126.51). This southern project is scheduled to be in the design phase in 2014, and the northern project is scheduled to be under construction in 2013. In 2002-2003 KY 7 from Sandy Hook north, past Newfoundland (the eastern terminus of the KY 32 project), to KY 885 was reconstructed by KYTC. Combined, these three projects will result in a reconstructed KY 7 through Elliott County, and improve the connection to I-64 in Carter County.

In March 2006, KYTC published the *KY 645 Regional Corridor Study (KY 645 Study)* for the extension of KY 645 from US 23 to I-64 (KYTC Item 12-115). The objective was to study possible locations for constructing a new road between these two termini, a distance of 40 to 50 miles. KY 645 at US 23 is located about 25 miles southeast of Sandy Hook, Kentucky. Through an alternatives screening process, seven alternatives were eliminated, and Corridors 2 and 5 were recommended for further study. These two corridors share the same southeastern 25 miles between KY 645 and Sandy Hook, and then split north of Sandy Hook. Corridor 2 follows KY 32 to Morehead (the same corridor being studied under KYTC Item 9-192.00), and Corridor 5 follows KY 7 and 504KY 1620 routes north to I-64 near Olive Hill (see Figure 10, corridors highlighted in purple).

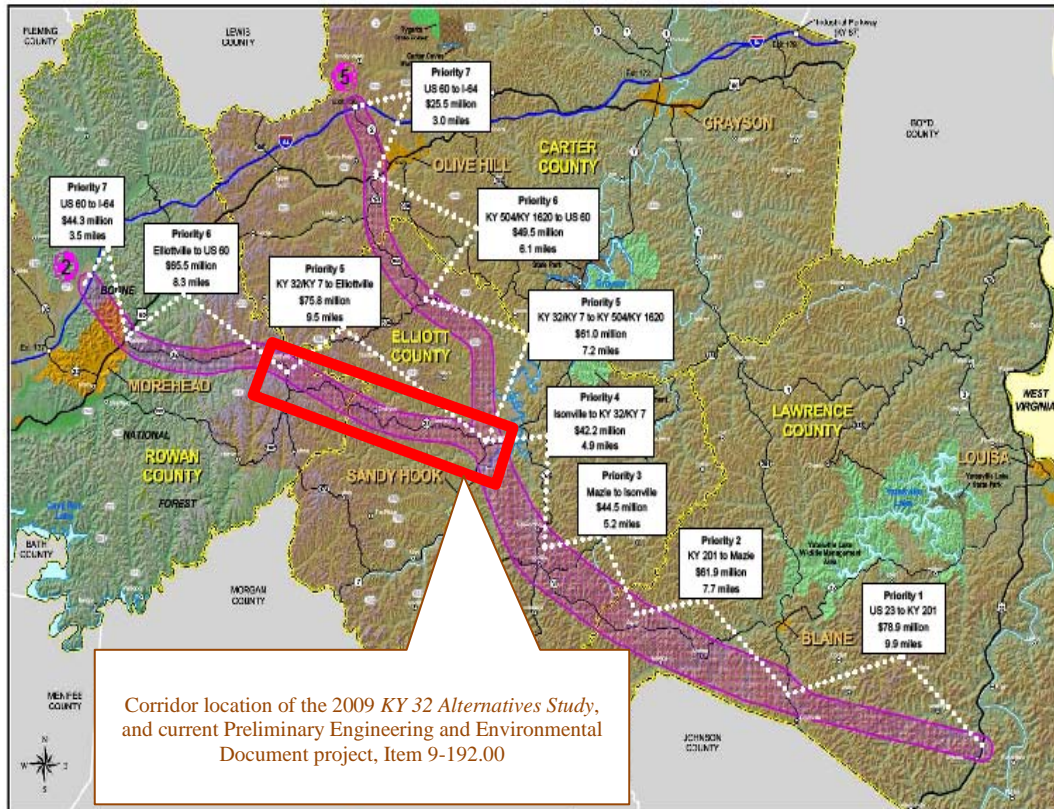


Figure 10: Corridor Locations—2006 KY 645 Study Corridors (Purple) and 2009 KY 32 Alternatives Study Corridor (Red)

The 2006 *KY 645 Study* was funded in the FY 2002 (2000-2006) Six-Year Highway Plan, with committed funds for the Planning phase, only. Subsequent phases of project development, including Design, Right-of-Way Acquisition, Utility Relocation, and Construction, were not scheduled in any subsequent Six-Year Highway Plan. In addition, in the 2009 *KY 32 Alternatives Study*, the only mention of the *KY 645 Study* was in meeting minutes, wherein KYTC officials and other leaders stated that the two projects were independent and separate. No mention of the 2006 *KY 645 Study* was made in the body of the 2009 *KY 32 Alternatives Study*. For these reasons, the KY 645 corridor project is illustrative, only—it has no defined corridor, no funding, no plans for advancement, and therefore, its implementation is not reasonably foreseeable. Should it be advanced at some point in the future, the 2006 cost estimates of about \$400 million would require federal funding, and therefore require a separate NEPA analysis and document for that project.

The currently proposed reconstruction options for KY 32 (KYTC Item 9-192) stem from the 2009 *KY 32 Alternatives Study*'s recommendation that the KY 32 corridor (see red box, Figure 10) be advanced to the Preliminary Engineering and Environmental Documentation stages. In summary, currently proposed KY 32 reconstruction options are not being planned as part of the KY 645 corridor concept.

3.2 Impacts to Agricultural Lands

Formal consultation with the USDA's Rowan and Elliott counties' offices of the Natural Resources Conservation Service (NRCS) for compliance with the *Farmland Protection Policy Act of 1981* has been completed (see Appendix A). In accordance with state and federal regulations concerning farmland protection, the Farmland Conversion Impact Rating for Corridor Type Projects, Form CPA-106 was used to evaluate this project's effect on farmland. The returned forms included the NRCS-assigned "Relative Value" of the farmland to be converted (scale of 0–100), per alternative for both Elliott and Rowan counties. Ten corridor assessment criteria listed on Form CPA-106 were then applied to each alternative within each county. The criteria have assigned values ranging from 0-5 to 0-25 points. The assessment criteria were scored according to the NRCS instructions and 7 CFR 658.5. The points identified for each criterion were then added to determine the Corridor Assessment score for each alternative within each county. This score was then added to NRCS's "Relative Value" points to arrive at the total Farmland Rating Points for each alternative. In 7 CFR 658.4(c)(1), the USDA recommends that "sites with the highest combined scores be regarded as most suitable for protection under these criteria and sites with the lowest scores, as least suitable." In addition, USDA recommends in 7 CFR 658.4(c)(3) that "sites receiving scores totaling 160 or more be given increasingly higher levels of consideration for protection." The evaluation results (see Table 7) indicate the proposed project's impact on farmland would not be adverse and the protection of this farmland should not override the need for the project.

Table 7: Potential Agricultural Impacts

Selected Sections from CPA-106 Form	Alt. 1A	Alt. 1B	Alt. 2A	Alt. 3 (Preferred)
Elliott County				
Total Acres to be Converted (All Uses)	85	274	231	337
Acres of Prime and Unique Farmland	0.0	0.4	0.2	0.0
Acres of Statewide and Local Important Farmland	3.2	9.5	7.6	20.1
Total Farmland Rating Points from Form CPA-106, Part VII*	72	67	69	78
Rowan County				
Total Acres to be Converted (All Uses)	79	147	140	227
Acres of Prime and Unique Farmland	0.1	1.8	2.0	3.0
Acres of Statewide and Local Important Farmland	0.0	0.8	0.6	0.6
Total Farmland Rating Points from Form CPA-106, Part VII*	69	76	74	75

Depending on which alternative is selected, about 0 to 3.0 acres are prime and unique farmland, and about 0 to 20.1 acres are statewide or local important farmland. The farmland in the project corridor is used for livestock grazing, limited crop cultivation (corn, hay, and tobacco), and forest. No agricultural districts are in or near the project area.

All alternatives except Alternative 3 would require fill material from offsite. For the other alternatives, to widen a road that is located along a ridge, as is KY 32, fill rock and dirt must be delivered to the site to build up the foundation so it will support the widened road and provide adequate slopes for safety and drainage. For illustrative purposes, the amounts of offsite material required for Alternatives 1A, 1B, and

2A were estimated to be 3.0, 6.5, and 5.0 million cubic yards, respectively. (See Figure 9, p. 15, regarding the method used to obtain the estimates.) Alternative 3 would require 7.0 million cubic yards of fill that would come entirely from within the future (state-purchased) right-of-way. The actual impacts to offsite borrow location(s) cannot be quantified because locations are generally not chosen until a project is let for construction. Should a build alternative other than Preferred Alternative 3 be selected, obtaining fill would result in substantial impacts, much of which would be to the open fields/agricultural lands that dominate the project area.

The rural nature of the project area makes some farmland impacts unavoidable with any build alternative. However, as noted above, coordination with NRCS indicated impacts from the conversion of agricultural land to highway right-of-way would be minimal. In the event farm operations are affected by a build alternative, a relocation assistance specialist would be assigned to deal specifically with those farms affected to help resolve problems resulting from splitting farms. Loss of farmland for right-of-way, or creation of an uneconomic remnant, will be addressed during the right-of-way acquisition phase should a build alternative be selected for construction.

3.3 Social and Economic Characteristics and Impacts

3.3.1 Socioeconomic and Demographic Characteristics

The following sections summarize the trends and status of the socioeconomic and demographic characteristics for the Commonwealth of Kentucky, Rowan County, Elliott County, and the proposed project's study area, as recorded in the 2010 Census and American Community Survey (ACS) estimates¹. The study area includes two census tracts and three block groups: Census Tract (CT) 9504, Block Group (BG) 3 in Rowan County; and CT 9201, BGs 2 and 3 in Elliott County. The three census block groups² containing the proposed project right-of-way were examined, and are collectively referred to as the "Socioeconomic Study Area" (see Figure 11). The results of the examination were presented in the *Socioeconomic Analysis* report prepared for this project and on file with KYTC. Tables referenced in subsections below are in the report and are identified as such by "(SA)" following the report's table number. The tables have been excerpted from the report and are provided in Appendix B, herein, for ease of reference.

Population Trends and Projections. Neither Rowan nor Elliott County is part of a Metropolitan Statistical Area. Rowan County's 2010 population of 23,333 ranked it 51st out of 120 counties in the Commonwealth. Elliott County's 2010 population of 7,852 ranked it as 111th out of 120 counties. Between 2000 and 2010, the populations of Rowan and Elliott counties and the state increased 5.6%, 16.4% and 7.4%, respectively. Kentucky State Data Center projections indicate that all three jurisdictions will continue to increase in population over the next 20 years, although the rate of increase will vary. No projected population figures are available for the Socioeconomic Study Area (i.e., below county level).

Table 3 (SA) presents the population data reported by the U.S. Census Bureau for the years 1980, 1990, 2000 and 2010 for the Commonwealth of Kentucky, Rowan County, and Elliott County. It also shows state and county population projections for the years 2020 and 2030 calculated by the Kentucky State Data Center, located at the University of Louisville. The data are based on assumptions about future births, deaths, and in and out migration.

¹ The American Community Survey (ACS) is an ongoing survey that provides data every year—giving communities the current information needed to plan investments and services. Information from the survey generates data that help determine how federal and state funds are distributed each year.

² A block group can be identified using its tract number followed by a decimal followed by the block number; e.g., BG 9504.3.

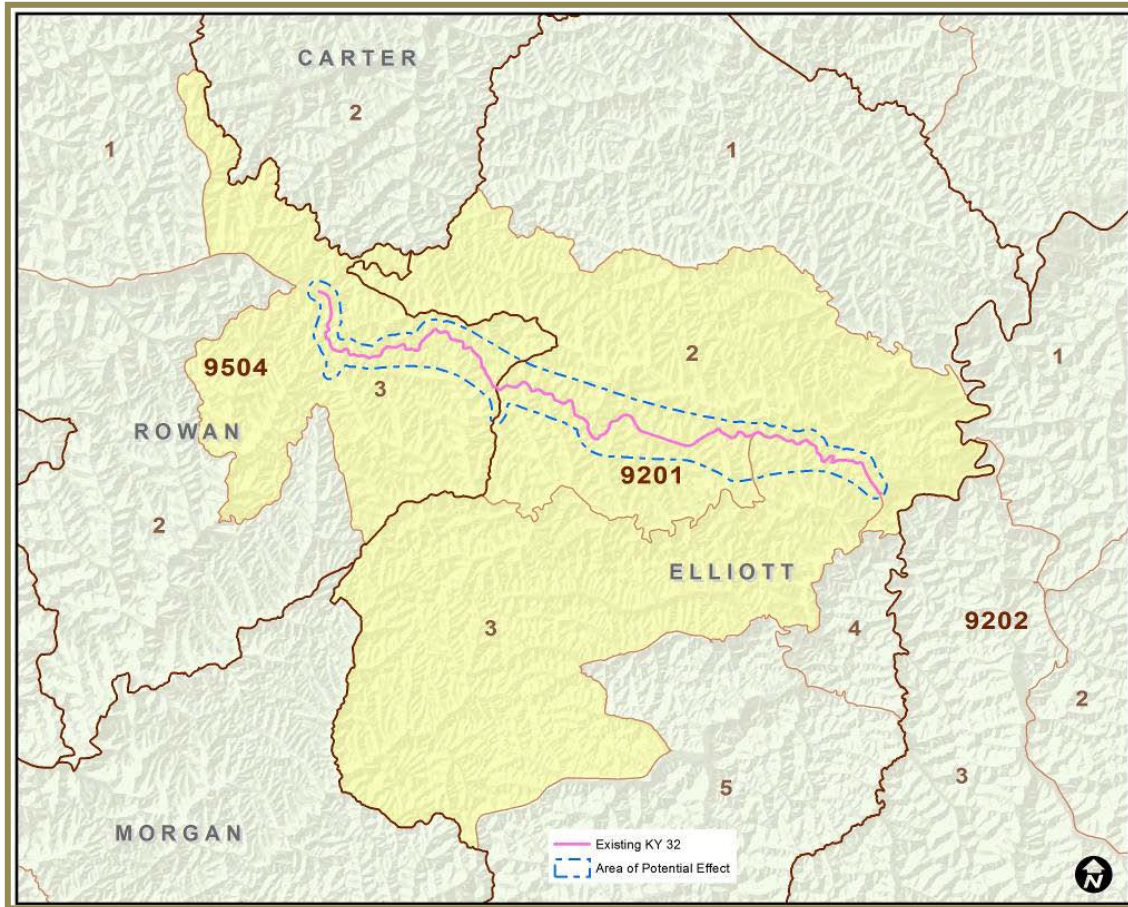


Figure 11: Socioeconomic Study Area— Census 2010: Census Tracts and Block Groups

Age Distribution. Overall, based on 2000 and 2010 Census data, the populations in the state, counties, and Socioeconomic Study Area appear to be aging, with Elliott and Rowan counties and the Socioeconomic Study Area population aging slightly faster than the state's. The 2010 population data indicate that Elliott and Rowan counties, and the Block Groups in the study area have lower percentages of school age children than the state. The percentage of elderly populations increased in all four jurisdictions from 2000 to 2010. The percentage of school age children decreased in all four jurisdictions, with the Socioeconomic Study Area experiencing the greatest decrease at 33.5%.

The Kentucky State Data Center projections for the state indicate the percentage of those from 18 to 65 and those over 65 years of age will generally continue to increase, while the percentage of those under 18 will decrease through the year 2030. Tables 4a and 4b (SA) present a summary of comparative population characteristics from the 2000 and 2010 Census for Kentucky, Elliott and Rowan counties, and the census block groups that comprise the Socioeconomic Study Area.

Racial Characteristics. Historically, the racial composition of the counties and block groups has always been nearly all white. In 2000, there were no racial minorities residing within the three census tracts. However, as indicated in the 2010 Census, a small number of non-whites have since established residency in the Socioeconomic Study Area. In 2010, BG 9504.3 in Rowan County and BG 9201.3 (9802.3 in 2000) in Elliott County reflected a small number of non-white residents—0.2% and 0.6%, respectively. This is in contrast to BG 9201.2 in Elliott County (9802.2 in 2000), which indicates 15.0% of

the residents are non-white. This increase from 0.0% in 2000 to 15.0% in 2010 could be attributed to the group residential quarters at the Little Sandy Correctional Complex opened in 2005. The racial compositions of these population areas consist of a much lower percentage of non-white persons than the state average. There are no minority neighborhoods located in the corridor of the proposed project build alternatives. Comparative age and race information from the 2000 and 2010 Census appears in Table 4b (SA) and more detailed 2010 Census race information is presented in Table 5 (SA).

Labor Force Characteristics and Unemployment Status. Profiles of selected economic characteristics are provided as American Community Survey (ACS) five-year estimates by the U.S. Census from 2006 to 2010, since actual figures from 2010 do not yet exist. Employment status characteristics for the residents of Kentucky, Elliott County, and Rowan County, age 16 years and older, are presented in Table 6 (SA). Overall, this area is characterized by similar unemployment rates.

In general, the ACS Census estimates of the unemployed population for Elliott and Rowan counties (6.9% and 3.4%) fell on either side of the state's rate (4.9%). More recent data available from the Kentucky Department for Workforce Investment indicates the 2012 unemployment rate³ for the state (8.5%) is within the range of the unemployment rates for Elliott County (11.1%) and Rowan County (7.6%). Table 6 (SA) also indicates the percentage of people "not in the labor force" is greater for Elliott and Rowan counties (60.8%, 45.4%, respectively) than the state (39.2%). This is partly attributable to higher percentage of elderly in Elliott County.

Employment by Industry. No employment by industry data are available for the Socioeconomic Study Area. In comparing the percentage of employment in each industry among the three jurisdictions, the largest employment industry in the state and Elliott and Rowan counties is the same: "educational, health and social services" at 23.2%, 27.2%, and 38.2%, respectively. The second largest industry in Elliott and Rowan counties is "retail trade" at 14.3% and 13.1%, respectively. A listing of employment-by-industry ACS five-year (2006-2010) estimates for Kentucky, Elliott, and Rowan counties is presented in Table 7 (SA).

Income and Percent of Residents Living below the Poverty Level. The ACS five-year (2006-2010) estimates for per capita and household income data published by the U.S. Census Bureau indicate that, overall, the populations of Elliott County and Rowan County are less wealthy than the rest of the state. The median household income of the state is \$41,576, which is more than Elliott County and Rowan County (\$22,097 and \$31,604, respectively). Elliott County and Rowan County had notably higher percentages of their total populations living below the poverty level than the state (36.5% and 29.8% respectively, versus the 17.7% state rate). Both counties had higher percentages of their youths and elderly in poverty than the state. Elliott County has approximately double the percentage youths below the poverty level (50.6%) than the state (24.3%); whereas Rowan County's figure (34.0%) is closer to the state's rate (24.3%). Elliott County also had twice as many elderly below the poverty level (25.6%) than did the state (12.7%); while Rowan County's rate (22.1%) was only slightly less than Elliott County's. Table 8 (SA) provides a summary of the ACS five-year (2006-2010) estimates for per capita and household income data for Kentucky, Elliott County, and Rowan County.

Since the Socioeconomic Report was issued, ACS data has been made available for the three block groups that make up the study area. ACS five-year (2006-2010) estimates for those living below the poverty level are as follows: BG 9504.3 in Rowan County 28.0%; and BG 9201.2 and BG 9201.3 in Elliott

¹ Unemployment statistics are based on estimates, and compiled to measure trends rather than count people working. Civilian labor force statistics include non-military workers and unemployed Kentuckians who are actively seeking work. They do not include unemployed Kentuckians who have not looked for employment within the past four weeks. Kentucky's statewide and county unemployment rates are not seasonally adjusted.

County are 17.4% and 23.8%, respectively. This equates to a 23.1% poverty rate in the study area.

Residents' Work Commuting Patterns. Motor vehicles are the dominant mode of transportation for anyone residing in Elliott or Rowan counties. In addition, between 73.2% and 81.5% drive to work alone. The mean travel time to work for the state is 22.5 minutes; for Elliott and Rowan counties are 32.7 and 22.9 minutes, respectively. Table 9 (SA) presents the means of commuting to work as estimated in the ACS five-year (2006-2010) estimates, for workers aged 16 years and older.

3.3.2 Communities Served by the Project

The communities that will be served by the project include the cities of Elliottville and Newfoundland at the project termini, and two named communities, Ordinary and Dewdrop. Although, historically, both communities had a store/post office building, all that remain now are one or two residences in each. The proposed project would also serve many other residents of rural Rowan and Elliott counties by improving the transportation network in this portion of the counties, providing access to regional centers of employment, health care, shopping, recreation, and other services.

Community Resources. The following sections address key public services located in the project corridor and, therefore, have the potential to be affected by the proposed project. The proposed project would not split community service boundaries, and is anticipated to improve access to services.

Health Care and Emergency Services—The area's health care and emergency medical facilities are located in Morehead, outside the project corridor. Currently, ambulances will avoid using KY 32 because of the substandard design; rather, they will add time to their travel and use other routes to serve these areas of these two counties. The proposed road would provide a safer route toward Morehead. Implementing the proposed project would increase the efficiency and safety of community services (*i.e.*, fire, emergency medical, ambulance, law enforcement, rescue squad, and public school busses) in accomplishing their respective missions.

Educational Facilities—No schools are located in the project corridor. KY 32 is a school bus route and there are many stops along the curvy and hilly road. As a result, there are several "school bus stop ahead" warning signs along the corridor. The proposed road would provide a more direct route to/from Lakeside Elementary School in Sandy Hook, and to other schools that are outside the project area and accessed via sections of KY 32. The proposed project would also provide a safer facility and more efficient travel time for school buses.

Churches—Elliottville Baptist Church is in Elliottville near the intersection of KY 504. The Concord Enterprise Baptist Church is located along the south side of KY 32, approximately 4 miles from the KY 7 intersection. The project would have no adverse impacts to the churches. An improved roadway would be expected to provide a safer trip and more efficient travel time for vehicles heading to/from the churches.

Other Institutions—The Little Sandy Correctional Complex is outside the study area. It has been in operation since 2005 and has capacity for 961 inmates. It is a medium to minimum security prison, and much of the facility's truck traffic (both inbound and outbound) uses KY 32. The project would not directly impact the facility; however, an improved roadway would be expected to provide a safer trip and more efficient travel time for vehicles heading to/from the facility.

Parks, Recreational Areas, and Wildlife Management Area. Public parks or recreational areas near the project area are Grayson Lake State Park, Daniel Boone National Forest (within which is Cave Run Lake), and Ed Mabry-Laurel Gorge WMA (see descriptions, Section 3.1.1, *Principal Land Uses in the Project Area*). As noted in Section 3.11.1, *Section 4(f)*, through coordination with KDOW and KDFWR it

has been determined that no recreational or park lands will be acquired to implement any of the build alternatives; therefore, there would be no Section 4(f) use related to the recreational or park resources.

Shopping and Business Districts. In the project area, the few business establishments are generally located along the existing KY 32. Since these establishments are widely distributed along the highway, there is no area that could be recognized as a business or shopping district. There are three commercial buildings along the project corridor: a small commercial store that provides fuel and food services at the intersection of KY 32 and KY 173; a general store on the north side of KY 32 at approximately mile point 18.21; and a fuel station at the intersection of KY 32 and KY 7 in Newfoundland. No businesses would be displaced by Preferred Alternative 3; however, roadway on new alignment would attract traffic from existing KY 32. However, the existing KY 32 roadway will be maintained, thereby preserving access to the existing businesses. Section 3.3.3, *Economic Impacts—Taxes and Revenues*, discusses potential effects of the project on local economies. Potential business displacements are addressed in Section 3.4, *Relocations and Displacements*.

Pedestrian and Bicycle Facilities. No pedestrian or designated bicycle facilities are in place along the project corridor. Although the proposed project does not provide dedicated bike lanes or paths along its length, the increased lane and shoulder width would provide a safer place for bicyclists compared to the existing conditions. Preferred Alternative 3 would provide a roadway mostly on new alignment; therefore, sections of the old roadway could be designated for bicycle and pedestrian traffic.

Public Water Sources. The Safe Water Act (as amended in 1986) requires states to develop a wellhead protection program to protect public water supplies that use groundwater as their water source. Kentucky's Wellhead Protection Program (WHPP) is coordinated by KDOW's Groundwater Section. The program's regulations (KAR 401.4:220) require that counties develop county or regional plans that assess the quality of water used by public water systems as the sources of public drinking water, and develop protection plans for these sources.

In Rowan County, public water is provided to about 87% of the county's residents from surface water sources, primarily the Licking River. Since surface water is the source of drinking water, no Wellhead Protection Areas exist in Rowan County. There are three public community water systems in Rowan County: Morehead Utility Plant Board, Morehead State University Water Treatment Plant, and Rowan Water, Inc. In areas of the county not served by public water, the majority of households rely on private wells. In Elliott County, groundwater is the source of public and private drinking water. Public water is provided to approximately 35% of the county's residents by the Sandy Hook Water District (the only water supplier in the county) from four well sources. As such, Elliott County does have a Wellhead Protection Area that is south of Sandy Hook. The remainder of the households rely primarily on private wells.

Since the sources for drinking water in the area are both surface and ground sources, Best Management Practices would be employed as needed to protect the local water supply.

3.3.3 Economic Impacts—Taxes and Revenues

Considering both positive and negative revenue impacts of the proposed project, the following issues were identified: tax revenue and a short-term construction income surge. Overall, the direct revenue impacts of this proposed project would be negligible.

Each of the build alternatives would cause the direct conversion of private taxable property to non-taxable, government-owned right-of-way. The majority of land required is either open undeveloped agricultural land, or rural-residential. Constructing any proposed build alternative would result in the permanent removal of some land and buildings from the tax rolls. The taxable land loss would result in an

initial minimal tax revenue loss to Rowan and Elliott counties. The few small businesses bypassed by the construction of a road on new alignment could also experience revenue losses; however, the existing KY 32 roadway will be maintained, thereby preserving access to the existing businesses. Additionally, other economic development could occur as a result of the new alignment, to offset such losses.

Potential Benefits. The short-term economic benefit of this proposed project would be expected to stimulate the local economy in terms of jobs, sales, income, government revenue and expenditures, and other variables.

Regarding long-term socioeconomic benefits, the proposed project is also expected to enhance the competitive and locational advantages for Rowan and Elliott counties. An improved roadway would improve freight accessibility, which would also lessen the transportation costs for businesses and industries. The ACS five-year estimates by the U.S. Census from 2006 to 2010 indicate that the populations of Elliott County and Rowan County are less wealthy than the rest of the state. The median household income of the state is \$41,576, which is more than Elliott County and Rowan County (\$22,097 and \$31,604, respectively). Elliott and Rowan counties had higher percentages of their total populations living below the poverty level than the state (36.5% and 29.8%, respectively, versus the 17.7% state rate).

Although new development is not expected to locate along the proposed roadway solely as a result of implementing the proposed project, the improved transportation network would be expected to complement local efforts to encourage new employment opportunities and attract business to the area, as well as to enhance efforts of the Kentucky Tourism, Arts, and Heritage Cabinet, the Kentucky Department of Travel, and the Kentucky Tourism Council to promote this area's tourist and recreational attractions. An increase in tourism could increase business and employment opportunities in the two counties.

Stakeholders and the public have noted the value of the area's scenic vistas and recommend the following enhancements be included in the project design:

- Constructing scenic pullovers along the improved / relocated (depending on the build alternative selected) roadway.
- Using the section(s) of existing KY 32 corridor that would remain in place as a multi-use path and tourism attraction. Suggested amenities include signage and facilities to accommodate users.

KYTC commits to considering pullovers, multi-use paths, and associated enhancements and to establishing a stakeholders committee to review Phase II design plans for the potential to include such enhancements. Recommended Alternative 3 would provide the best opportunity for constructing scenic pullover areas and multi-use paths.

The overall *beneficial* socioeconomic impacts of implementing a proposed build alternative would be expected to outweigh the *negative* socioeconomic impacts. Alternatives 1B, 2A, and 3 would meet the purpose and need for the project, including providing an improved roadway that is constructed to current design and safety standards, thereby providing drivers with an alternative to existing KY 32. Any of the proposed build alternatives would provide improved access to the region's tourist industry attractions. Throughout the local area, a build alternative would increase overall travel speed, reduce travel time, and thereby improve the economy of travel by lowering operating costs. Accessibility, response time, and safety for law enforcement, fire protection, EMS, and school buses would be improved. Long-term economic benefits associated with regional accessibility could offset revenues lost. It is expected that the impacts to Rowan and Elliott counties' tax bases will not be significant in the long term.

3.4 Relocations and Displacements

Information was gathered by field visits and by reviewing planning documents and detailed mapping of the alignment options. For purposes of this report, it is assumed all residences are owner occupied, and that the number of employees of potentially impacted business ranges from one to three. Described below are the potential residential, commercial, and institutional relocations/ displacements, associated with this project. Table 8 summarizes the potential relocations/ displacements, and Table 9 identifies the estimated relocation/displacement assistance costs by alternative.

Table 8: Summary of Potential Relocations and Displacements

Alternative	Spot / Segment	Residential Relocations / (Business Displacements)	Cemetery Relocations
Alternative 1A	Spot 1	2	0
	Spot 2	0	0
	Spot 3, 4, 10	7	0
	Spot 5	5 / (1)	0
	Spots 6 - 11	0	0
	Total	14 (1)	0
Alternative 1B	Total	20 (0)	1
Alternative 2A	Total	13 (0)	1
Alternative 3 (Preferred)	Total	15 (0)	0

Residential Relocations. The build alternatives would potentially require 13 to 20 single-family residential relocations, depending on which build alternative is selected. No apartment complexes or other multi-family dwellings are within or adjacent to the proposed rights-of-way of the build alternatives. No minorities, handicapped individuals, or residences with five or more family members were observed living in the project corridor. Due to the higher proportions of elderly and low income individuals who characterize Elliott and Rowan counties, there may be impacts to people in these categories (see Section 3.5, *Environmental Justice*). Ancillary building displacements (*i.e.*, barns, sheds, farm buildings, detached garages, etc.) are likely with the selection of any build alternative. A comparative tally of these structures is not available.

Commercial/Industrial Displacements. The only business displacement that might directly result from the construction of the project would occur with Alternative 1A. In addition, roadway on new alignment would attract traffic from existing KY 32, potentially resulting in loss of revenues for some businesses along KY 32.

Institutional or Non-profit Organizations Displacements. No displacement of institutions is anticipated with the selection of a build alternative.

Cemeteries. There is the potential for 1 cemetery displacement with Alternatives 1B or 2A (Skaggs-Caudill, Site 23 on Exhibit 1 and Exhibit 4, Sheet 5).

Relocation Assistance Program. To minimize the unavoidable effects of right-of-way acquisition and displacement of people, KYTC offers a Relocation Assistance Program in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (Public Law 91-646), as amended in 1987. Housing and relocation resources would be available to all residential and business

relocatees without regard to race, creed, color, national origin, or economic status, as required by Title VI of the *Civil Rights Act of 1964*. In accordance with *Environmental Justice Executive Order 12898*, an analysis was conducted to identify any geographic areas containing disproportionately high concentrations of minority or low-income populations. It was concluded that none of the proposed build alternatives would have a disproportionately high and adverse effect on minority or low-income populations (see Section 3.5, *Environmental Justice*).

KYTC provides advance notification of impending right-of-way acquisition. Before acquiring right-of-way, all properties would be appraised on the basis of their fair market value. Owners of property to be acquired would be offered and paid fair market value for their property rights. No person lawfully occupying real property would be required to relocate without written notice of the intended vacation date; and no residential property occupant would be required to relocate until decent, safe, and sanitary replacement housing would be made available. "Made available" means the relocatee has either obtained (and has the right of possession of) replacement housing on his/her own; or the KYTC has offered the relocatee decent, safe, and sanitary housing within his/her financial means and available for immediate occupancy. KYTC has several options available to locate replacement housing, including:

- Repositioning dwellings on their existing property so they are outside the right-of-way limits.
- New house construction by the existing landowners.
- Relocating individuals into housing for sale on the real estate market, locally, regionally, or elsewhere.
- Advertisements in local media requesting to purchase housing meeting specific requirements.

In some situations, the demand for new housing generated by right-of-way acquisition could encourage new local ventures in real estate development to meet the housing requirements. If, however, decent, safe, and sanitary replacement housing cannot be found by these or other means, or if there is no housing within the displacee's financial means, then Housing of Last Resort may be considered.⁴

A review of the local housing market reveals a limited supply of comparable housing available at any one time. For example, on REALTOR.com, as of June 2012, there were no listings in Elliottville but there were seven single-family residences listed on the market in the Newfoundland and Sandy Hook areas.⁵ The pricing of these six homes ranged from \$24,900 to \$125,000. It is anticipated that there could be more relocations than available, affordable residences at any given time; consequently, it is unlikely all the residences could be relocated at the same time. However, over the course of a year or more for relocations, it is possible that sufficient comparable housing would become available when the right-of-way is acquired for this proposed project. Accordingly, it is likely the relocations for this project would be accomplished using normal relocation procedures, and the need for Last Resort Housing should not be anticipated. This program would be used if comparable replacement housing would not be available, or unavailable within the displacee's financial means, and the replacement payment exceeds the state legal limitation.

⁴ "Last resort housing" is a program used when comparable replacement housing is not available or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. This program is used, as the name implies, only as a "last resort," when there is no adequate opportunity for relocation within the area.

⁵ Residential listings for these cities incorporate almost all of the properties in both counties listed on REALTOR.com. Every effort is made to relocate residents in the vicinity of the residence from which they are moving. Therefore, available housing in the adjacent counties of Fleming, Bath, Menifee, Morgan, Lawrence, Carter and Lewis was not researched for this report.

Under the Relocation Assistance Program, when right-of-way is acquired, at least one relocation specialist is assigned to the roadway project to execute the relocation assistance and payments program. The relocation specialist contacts each person/family to be relocated to ascertain individual needs and desires. The specialist also provides information, answers questions, and provides assistance in finding replacement property. Relocation services and payments would be provided without regard to race, color, religion, sex, national origin, or economic status. All tenants and owner-occupant displacees would receive an explanation regarding all options available to them, such as: varying methods of claiming moving expenses reimbursement; replacement housing rental, either private or publicly subsidized; replacement housing purchase; or moving owner-occupied housing to another location. Financial assistance would be available to the eligible relocatee for the following:

- Reimburse the relocatee for the actual reasonable costs of moving from homes, businesses, and farm operations acquired for a highway project.
- Make up the difference, if any, between the amount paid for the acquired dwelling and the cost of a comparable decent, safe, and sanitary dwelling available on the private market.
- Provide expenses reimbursement, such as legal fees and other eligible closing costs incurred in buying a replacement dwelling.
- Make payment for eligible increased interest costs resulting from having to acquire a higher interest rate mortgage.

A displaced tenant may be eligible to receive a payment to rent a replacement dwelling or room, or use as a down payment, including closing costs, on the purchase of a replacement dwelling. A brochure entitled "Your Benefits as a Highway Displacee under the Relocation Assistance Program" describes in detail the state assistance available, and would be made available to interested person(s).

Relocation schedule. KYTC has included the KY 32 improvement project in its FY 2012 Highway Plan. The state has scheduled design work for FY 2012, and right-of-way acquisition for FY 2013. Currently, there are no other known projects, public or private, or economic development initiatives that might compete for available housing during or surrounding FY 2013.

3.5 Environmental Justice

Environmental Justice Policy. Title VI of the 1964 Civil Rights Act requires each federal agency to ensure that "no person, on the grounds of race, color or national origin, be excluded from participating in, denied the benefits of, or subjected to discrimination" under any program or activity receiving Federal Aid. Title VI implications on the transportation planning process were further refined on February 11, 1994, in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The Executive Order requires each federal department and agency to "identify and address disproportionately high and adverse human health or environmental effects of their policies, programs and activities on minority populations or low income populations." On April 15, 1997, the U.S. Department of Transportation (USDOT) published DOT Order 5680-1 as a component of the June 29, 1995, Federal Highway Administration's Environmental Justice Strategy. The Order, which appeared in the *Federal Register*, Volume 62, Number 72, describes the process USDOT implemented to incorporate Environmental Justice principles into existing programs, policies, and activities. Most recently, the FHWA issued DOT Order 5610.2(a), *Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, on May 2, 2012.

In accordance with FHWA environmental justice policy and guidance, there are two key criteria for determining whether an action will cause a disproportionately high and adverse effect on minority

populations or low-income populations: (1) an adverse effect that is predominantly borne by a minority or low-income population, or (2) an adverse effect that will be suffered by a minority or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority or non low-income population.

Environmental Justice Analysis. The analysis is being conducted in a two-step process: The first step has been completed as part of this Environmental Assessment (EA); the second step will be completed after the EA is presented at a Public Hearing, but prior to making a final selection.

First Step: The first step was conducted to estimate if (A) there would be a likely disproportionate impact and (B) if it would likely be adverse. Regarding disproportionate impacts, efforts to identify areas of low-income and minority populations within the Socioeconomic Study Area included reviews of census data (see Section 3.3.1, *Socioeconomic and Demographic Characteristics*, subsections “Racial Characteristics” and “Average Income and Percent of Residents Living Below the Poverty Level”), project area maps, field observations, and discussions with local officials and with property owners and residents at public meetings.

Regarding minority individuals and households, the census data analysis, discussions with local officials and residents at public meetings, and field observations revealed no known minorities living within the project corridor. For year 2010 Census data, the percentages of "one race-white" for Elliott County and Rowan County were 95.6% and 96.1%, respectively. Because no known minorities live along the corridor, a disproportionately high impact to minorities is not anticipated, but further research will need to be conducted on a case-by-case basis before that determination is final.

Regarding low-income individuals and households, the most recent available data for the study area level is from the ACS five year (2006-2010) estimates. This data indicates that the two counties have notably high percentages of low-income individuals (36.5% for Elliott County and 29.8% for Rowan County). Because the percentages of low-income are high throughout the counties, and based on field observations, it is likely low-income individuals will be relocated.

Second Step: Further research will include obtaining racial and income data on a case-by-case basis for the approximate 15 residences to be relocated by Preferred Alternative 3. The additional research will include distribution of a survey tool in KYTC’s Environmental Justice Analysis Guidance, dated June 27, 2011. This survey will be sent to all potential relocatees, and the research will be supplemented, as necessary, with interviews of property owners and residents.

Thresholds for determining disproportionate impacts will be set based on the averages from the two counties:

- For minorities, since the average of the counties of the “white alone” population is 96% (rounded), should 4% or more of the relocations be minorities, it would be determined to be a disproportionate impact. For Preferred Alternative 3, there are 15 relocations; therefore, should one of them (6.7%) be minority, it would be a disproportionate impact.
- For low-income, since the average of the counties of the people living at or below the poverty level is 33% (rounded), should more than 5 of the 15 relocations be low-income, it would be a disproportionate impact.

Should adverse effects to environmental justice populations be identified, minimization and mitigation commitments will be provided in the FONSI with the goal of obtaining an overall determination of no adverse impact to environmental justice populations.

Regarding positive effects to environmental justice populations, the benefits of improved mobility, access to medical care, decreased emergency response times, reduced travel time and costs, and improved safety, would be made available to all resident populations, including environmental justice populations.

The No-Build Alternative would have no direct impacts to minority and low-income populations. However, these populations, as well as the general population of the area, would not receive the benefits of the project including reduced travel time, reduced travel costs, and increased safety.

3.6 Air Quality

Elliott County and Rowan County are currently in attainment for all criteria pollutants—carbon monoxide, ozone, particulate matter, lead, nitrogen dioxide, and sulphur dioxide. Based on the Kentucky CO Screening Procedures for NEPA Background Documentation for the determination of existing and future one-hour and eight-hour CO levels, the proposed KY 32 project will not have a negative impact on the ambient air quality of either county.

For each alternative in the KY 32 project, the amount of MSAT emissions would be proportional to the vehicle miles traveled (VMT), assuming other variables such as fleet mix are the same for each alternative.

The VMT estimated for Preferred Alternative 3 is only slightly (3.4%) higher than that for the No-Build Alternative, and only about 7% higher than that with the other build alternatives (see Table 10). This is the case for Alternative 3 because the additional capacity associated with the reconstruction of KY 32 on a new alignment increases the efficiency of the roadway and attracts trips from KY 173 and elsewhere in the transportation network. The slight increase in VMT with Alternative 3 would be expected to lead to slightly higher MSAT emissions for that alternative along the highway corridor. However, considering the design year (2035) traffic forecast for Preferred Alternative 3 (AADT 1,750), the project has low potential MSAT effects as defined by the February 3, 2006 FHWA Interim Guidance on Air Toxics Analysis in NEPA documents.

Table 9: Project Vehicle Miles Traveled (Daily VMT)—KY 32, Design Year 2035

	No-Build Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 3 (Preferred)
Total VMT	5,799,000	5,594,000	5,642,000	5,593,000	5,996,000
% Change from No-Build	----	- 3.5%	- 2.7%	- 3.6%	+ 3.4%

Source of traffic data used in the Air Quality Analysis: “Technical Report: District 9 Traffic Forecast,” October 2012.

The purpose of this project is to provide a roadway having improved horizontal and vertical geometry compared with existing KY 32, which is a major east-west highway corridor through Rowan and Elliott counties in a rural section of northeastern Kentucky. This project will not result in appreciable changes in project location, traffic volumes (see Table 3, p.6) vehicle mix, or other factors that would cause an increase in MSAT impacts over that of the No-Build Alternative. Moreover, USEPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with USEPA’s MOBILE6.2 model forecasts a combined reduction of 72% in the total annual emission rate for the priority MSATs

from 1999 to 2050 while vehicle-miles of travel are projected to increase by 145%. This will reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

In accordance with the *Amended Final Conformity Guidelines* issued by both the U.S. Department of Transportation and USEPA, which have been in effect since September 15, 1997, the project is located in an air quality area that does not require transportation control measures. The proposed project is included in the Statewide Transportation Improvement Program, Fiscal Years 2011-2014 (STIP Appendix A, Item No. 9-192.1, p. 90); and it is in compliance with the Kentucky State Implementation Plan for the Attainment and Maintenance of National and State Ambient Air Quality Standards.

3.7 Noise

Noise can be generally defined as unwanted sound. It is a vibrational energy form that causes pressure variations in elastic media such as air or water. The human ear perceives these variations as sound. The ear can discern different levels of loudness as the intensity of pressure variations fluctuates. These pressure differences are commonly measured in decibels (dB). The decibel scale audible to humans ranges from 0 to 140 dBs. A level of zero decibels corresponds to the lowest limit of audibility, while a level of 140 decibels represents the threshold of pain.

Traffic noise impacts were analyzed in accordance with FHWA procedures established for the abatement of highway traffic noise and construction noise as outlined in Part 772 of Title 23 of the Code of Federal Regulations (CFR), and according to the KYTC's 2011 Noise Abatement Policy. An effective, quantitative noise impact analysis must first identify potential noise sensitive land uses in the project area, and establish existing noise levels at these sites. Future (2035) noise levels are then predicted and compared to both existing noise levels and Federal noise level criteria to determine the noise impacts resulting from implementing the project.

3.7.1 Existing Noise Levels

To gain an accurate representation of the overall study corridor with respect to potential noise impacts, four (4) reading locations were chosen to represent typical noise-sensitive receptors along the project area late morning of June 14, 2012. The four noise sensitive receptors were selected based on FHWA noise abatement criteria (NAC) guidelines established for noise sensitive land uses, as shown on Table 11. Sites 1–3 were located relatively close to the existing KY 32 alignment and, therefore, to Alternatives 1A, 2A, and 1B. Site 4 was approximately 400 feet from existing KY 32, and was selected to model existing and projected conditions near the alignment of Alternative 3. Site 4 was below the grade of existing KY 32 and, due to the distance from the road, the noise recorded is considered ambient noise because traffic was not the dominant noise source. Sites 1–3, however, had clear and unobstructed views of KY 32. The sites are listed in Table 12 and shown on Exhibit 2.

Activity Category B was applicable to all four noise sensitive receptors. The NAC standard established for Category B sites is 67 dBA L_{eq} (exterior). As shown in Table 13, existing measured noise levels in the project corridor range from 54 dBA L_{eq} at Site 3 to 63 dBA L_{eq} at Site 2. Noise levels were assumed to approach the NAC levels if the resultant noise level was within 1 dBA of the value shown for the appropriate activity category identified in Table 13 (67 dBA for Category B). However, no recorded noise levels approached the NAC levels for residences.

Table 10: FHWA Noise Abatement Criteria

Activity Category	Hourly A-Weighted Sound Level: Decibels (dBA)		Description of Activity
	L _{eq} (h)	L ₁₀ (h)	
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Residences.
C	67 (Exterior)	70 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	55 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios..
E	72 (Exterior)	75 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

Source: "Highway Traffic Noise: Analysis and Abatement Guidance." December 2011, FHWA.

Table 11: Identification of Noise Receptors

Activity Category & Site #	NAC	Description ¹	Total Receptors ²
1 B - Residential	67	Three residences in very close proximity to each other and have parcel owners of the same name. Also very close to Alternative 3 (60 ft north of existing KY 32)	3 residences
2 B - Residential	67	Possible cluster of four residences; these are closer to existing KY 32 than to Alternative 3 (25 ft south of existing KY 32)	4 residences
3 B - Residence	67	Two houses on the same parcel (one is vacant); these are closer to existing KY 32 than to Alternative 3 (80 ft north of existing KY 32)	2 residences
4 B - Residence	67	Two houses on Tommy Pennington Road; these are closer to Alternative 3 than to existing KY 32 (400 ft south of existing KY 32)	2 residences

¹ All distances measured from edge of roadway pavement.

² Total number of receptors represented by the study site, including the study site receptor.

3.7.2 Future Noise Levels

Future noise levels for the No-Build Alternative and the proposed build alternatives were modeled using the FHWA Traffic Noise Model (TNM2.5) computer model. The analysis results are summarized in Table 13. The analysis of the noise impacts associated with the No-Build and build alternatives was based upon traffic information for the design year (2035).

Table 12: Existing and Predicted Noise Levels (dBA, L_{eq})

Site	NAC	Existing Measured Noise Levels (dBA L _{eq})	Predicted Noise Levels (dBA L _{eq})					Noise impact (Approach / exceed criterion, or substantial increase over existing levels)				
			No-Build	Alt. 1A	Alt. 1B	Alt. 2A	Alt. 3	No-Build	Alt. 1A	Alt. 1B	Alt. 2A	Alt. 3
1	67	55	64	55	55	64	55	No	No	No	No	No
2	67	63	65	63	61	57	52	No	No	No	No	No
3	67	54	59	62	56	59	46	No	No	No	No	No
4	67	57*	44	45	44	43	40	No	No	No	No	No

* The Field Measured Existing Level at the receptor is primarily the result of ambient noise levels.

No-Build Alternative. The results of the noise analysis conducted for the No-Build Alternative indicate that year 2035 noise levels without the project would range from 44 dBA L_{eq} at Site 4 to 65 dBA L_{eq} at Site 2. The predicted levels represent a difference from existing noise levels by an increase of 9 dBA L_{eq} at Site 1, and a reduction of 13 dBA L_{eq} at Site 4. Generally, a 3-dBA L_{eq} change is considered as the minimum average increase perceived by most people. None of the sites approach or exceed the NAC standard of 67 dBA.

Build Alternatives. Each of the build alternatives will produce transportation noise impacts at some sites studied. The impacts found from this project indicate that noise levels at some sites may slightly increase, decrease, or remain relatively consistent with existing conditions. None of the predicted noise levels of the build alternatives are expected to approach or exceed the NAC standard of 67 dBA, or exceed the existing noise levels by 10 dBA L_{eq} or more; therefore, the study sites are not expected to experience traffic noise impacts.

3.7.3 Noise Abatement Measures and Summary

KYTC has developed a policy consistent with FHWA guidelines to determine the need, feasibility, and reasonableness of noise abatement measures, including barrier walls, for all major highway projects. FHWA, in 23 CFR Part 772, offers a number of measures for abating or eliminating highway noise impacts including traffic management measures, alteration of horizontal and vertical alignments, acquisition of property rights or acquisition of property, construction of noise barriers and noise insulation of public use or non-profit institutional structures.

KYTC and FHWA generally give the most consideration to the construction of noise barriers between the shoulder and the right-of-way limits. KYTC has established a policy for determining the reasonableness of when and where barriers should and should not be constructed and considers the following factors: the noise impact severity, the number of people affected, barrier costs, the structural feasibility of a barrier, and the impacted residents' viewpoint. Upon review of KYTC's policy for considering barrier reasonableness, it was determined that criteria for constructing barrier walls as a means of noise abatement were not met at any receptor location for this project.

None of the build alternatives were predicted to produce traffic noise that would result in noise impacts. Based on the project area's topography, which consists mainly of rolling terrain, it is likely that the final design would result in noise levels similar to those predicted for this study. Should this be the case, as predicted, there would be no noise impacts as a result of any of the build alternatives; therefore, noise abatement measures would not be required with this project. A detailed analysis of the barrier reasonability is included in the Highway Noise Study provided to KYTC.

3.8 Aquatic and Terrestrial Ecosystems

An *Ecological Assessment Report (Ecological Report)* was prepared as a baseline study for this project, and is on file with the KYTC. The results of the study and subsequent analyses to address potential impacts are summarized in the sections below, as follows: Sections 3.8.1 and 3.8.2 describe the findings of the aquatic ecosystem and terrestrial ecosystem analyses, respectively; Section 3.8.3 discusses the potential for the occurrence of federal- and state-protected species in the project area; Section 3.8.4 addresses measures to avoid, minimize, or mitigate impacts to ecosystems and protected species as a result of the project; and Section 3.8.5 summarizes the coordination that has taken place with regulatory and other agencies having jurisdiction over or an interest in potentially affected ecosystems and protected species.

3.8.1 Aquatic Ecosystems

3.8.1.1 Water Quality and Aquatic Habitat Sampling.

The KY 32 study corridor is located on a ridgeline and is bordered to the north and south by Big Caney Creek and Laurel Creek, respectively. These streams have been listed by the Commonwealth of Kentucky as Special Use Waters including designations as Cold Water Aquatic Habitat (CAH), Exceptional Use Waters, Reference Reach Waters, and Outstanding State Resource Waters (OSRW). Waters/wetlands identified within the study area include two perennial streams (Christy Creek [“P1” in the *Ecological Report*] and Big Caney Creek [P2]), 71 intermittent streams, 113 ephemeral streams, 27 wetlands, and 36 open water ponds.

Water quality samples were collected from 19 stream sampling points within or near the study area and from the four sampling stations along Big Caney Creek and Laurel Creek (CAH streams). The water quality samples were taken from 7 perennial streams, 13 intermittent streams, and 3 ephemeral streams. Due to the number of streams within the corridor, not all the streams were sampled. The results of the analytical water quality testing indicate that the samples met the water quality standards for chloride, per the warm water aquatic habitat standard, but did not meet the standard for alkalinity at Stations 8 and 9. The water samples met the water quality standards for sulfate, per the CAH standard. Detailed explanations of survey methodology and survey results are contained in the *Ecological Report*.

The aquatic habitats were surveyed according to guidelines from Kentucky Division of Water’s (KDOW) most current publications: *Methods for Assessing Biological Integrity of Surface Water*, the *Kentucky Macroinvertebrate Bioassessment Index (MBI)*, and *Development and Application of the Kentucky Index of Biotic Integrity (KIBI)*. Collection and analysis of all data was completed by degreed biologists and reviewed by professionals to ensure accuracy.⁶ Sampling was performed at 23 sample stations on perennial or intermittent streams throughout the study area, adjacent watersheds near the study area, Big Caney Creek, and Laurel Creek. To assess the existing conditions of aquatic communities near the proposed stream crossings, the following components were evaluated: 1) fish communities, 2) benthic (bottom dwelling) macroinvertebrate communities, 3) stream habitat, and 4) water quality (*in-situ* and laboratory measurements). The results of the inventory and analyses are summarized below.

Fish. Fish sampling was conducted at Stations 1 and 20 within or near the study area, and at three CAH sampling locations (Stations 21 and 22 on Laurel Creek, and Station 23 on Big Caney Creek) on September

⁶ During local stakeholder meetings, the research of a MSU graduate student was identified. The thesis work of Audrey M. Richter entitled *Bioassessment of Fish and Aquatic Macroinvertebrates Communities of Laurel Creek in Rowan and Elliott Counties, Kentucky* was obtained from the MSU library⁶. Eight sampling locations were assessed in the thesis study during 2008 and 2009 in the upper portion of Laurel Creek.

15 and 16, 2011. Fish populations were evaluated following standard sampling methods outlined by KDOW (2010). Stations 1 and 20 drain watersheds of approximately 570 and 260 acres, respectively. Cumulatively, seven species of fish were caught from these sampling locations. Stations 21, 22, and 23 drain watersheds of approximately 900 acres, 14,700 acres, and 10,900 acres, respectively. Cumulatively, 22 species of fish were identified from these three stations. Fish collected were identified as to species, examined for visible physical abnormalities, and returned live to the stream at, or near, the point of capture. KIBI⁷ was used to assess each of the sampled fish assemblages by means of a water quality rating. The sampled streams within the study area rated “Fair” (Station 1) and “Poor” (Station 20). The CAH stream sampling results rated Big Caney Creek “Good” (Station 23), and Laurel Creek “Fair” (Station 22) and “Excellent” (Station 21).

Macroinvertebrates⁸. Macroinvertebrate community attributes are used in water quality assessments to describe water quality conditions or health of the aquatic ecosystem and to identify causes of impairment. Macroinvertebrate populations were assessed during May and September 2011, at a total of 11 sites within or near the study area and 4 sampling stations along Big Caney Creek and Laurel Creek. The watersheds of sample locations within the study area all drain less than one square mile and are, therefore, considered headwater streams. Sampling locations are depicted on Exhibit 5 in the *Ecological Report*.

Macroinvertebrate data were evaluated based on the Macroinvertebrate Bioassessment Index (MBI) as described by KDOW (2003b). Based on the MBI, streams within or near the study area rated either “Fair” (7 streams) or “Poor” (4 streams) with the exception of Station 19, which rated “Very Poor”. Station 19, as well as Stations 10 and 16 (each rated “Poor”) drain watersheds of less than 40 acres and, therefore, receive very limited sustained flow, which has a significant influence on the streams biological potential. Station 4, also rated “Poor,” is located at the headwaters of Laurel Creek and is negatively influenced by adjacent land use (trash/debris dumping), nearby road crossing, and stream channelization. Sampling efforts along the other CAH streams rated within the “Fair” category.

Mussels. Streams within the study area were visually assessed for the presence of mussel species during the numerous site visits. No fresh-water (unionid) mussels were observed within the streams. Mussels observed in the streams were limited to individuals of Asian clam (*Corbicula* spp.).

A habitat assessment was completed for each perennial and intermittent stream using the Habitat Assessment Form (Rapid Bioassessment Protocol, RBP) method in *Methods for Assessing Biological Integrity of Surface Waters in Kentucky*⁹, the results of which are provided in Appendix E of the *Ecological Report*. Due to their small sizes and flow rates that were low or non-existent at the time of the survey, ephemeral streams were not individually evaluated using the RBP method. In all, approximately 70% of all streams rated “average” or “higher” in quality.

3.8.1.2 Streams

Two perennial streams totaling 815 linear feet, 71 intermittent streams totaling 35,580 linear feet, and 113 ephemeral streams totaling 24,710 linear feet were identified within the study area during the field assessment. The majority of the streams reported in the *Ecological Report* were considered jurisdictional; however, USACE will not make its official jurisdictional determinations until the permitting phase of the project. Exhibit 1 shows the locations of streams in and adjacent to the project corridor, and Exhibit 4,

⁷ KDOW. *Development and Application of the Kentucky Index of Biological Integrity (KIBI)*, Frankfort, Kentucky, 2003a.

⁸ An invertebrate (animal without a backbone) that is large enough to be seen without the aid of a microscope.

⁹ 2008. *Kentucky Division of Water*, Revision 3, Frankfort, Kentucky.

Sheets 1–14, shows the streams within the build alternatives' disturbance limits. Table 14 shows the total length and jurisdictional status of streams within the disturbance limits of each build alternative.

Note: As previously indicated in section 2.3.2, impacts to terrestrial and aquatic resources within the right-of-way appear to be greater for Alternative 3 than those for Alternatives 1A, 1B, and 2A. This is because these three alternatives will require fill material from an offsite borrow location(s), and additional impacts at those locations, are not reflected in the impact calculations. The additional impacts to areas outside the rights-of-way of Alternatives 1A,1B, and 2A cannot be quantified at this time because the location of the borrow site(s) will not be known until just prior to construction. The following impacts and mitigation costs are estimated based on the direct impacts, only, not the anticipated impacts from borrow sites.

Table 13: Linear Feet of Streams Within Disturbance Limits of Build Alternatives

Stream Type and Jurisdictional Status*		Total Linear Feet (LF) of Streams Within Disturbance Limits			
		Alternative 1A	Alternative 1B	Alternative 2A	Alternative 3
Perennial:	Jurisdictional / (Isolated)	185 / (0)	305 (0)	315 (0)	755 (0)
Intermittent:	Jurisdictional / (Isolated)	5,575 / (0)	9,615 / (100)	7,395 / (100)	21,710 / (0)
Ephemeral:	Jurisdictional	2,780 / (0)	7,635 / (515)	6,080 / (515)	14,085 / (365)
Total LF Jurisdictional / (Isolated)		8,540 / (0)	17,555 / (615)	13,790 / (615)	36,550 / (365)
Total Linear Feet Stream Impacts		8,540	18,170	14,405	36,915
Estimate Mitigation Costs for Direct Impacts		N/A	\$3.8M	\$1.9M	\$12.5M

* This represents the jurisdictional status identified in the *Ecological Report*, and does not reflect an official determination by USACE. The agency will make its final jurisdictional determinations during the permitting phase of the project.

During the development and evaluation of alternatives for this project, careful consideration was given to stream crossings to avoid or minimize their associated impacts. The USGS 7.5-minute topographic map for the area depicts the named streams: Christy Creek, Big Caney Creek, Laurel Creek, Laurel Fork, Bates Branch, Clifty Creek, Hopkins Cave Branch, and Rocky Creek. Due to the location of the project on a ridgetop, the only named streams the project crosses are Christy Creek at the western end of the project, and Rocky Creek in the central portion of the project.

Anticipated impacts to streams consist of erosion resulting in siltation into the streams as well as possible pollutants from stormwater runoff. Impacts are expected to be of minimal magnitude due to the mitigation measures that will be employed to minimize impacts from erosion and runoff into the streams impacted by implementation of a build alternative. Mitigation measures will primarily consist of temporary erosion control techniques during construction such as silt fences, as well as permanent measures such as stormwater collection devices and bio-swales.

Stream impacts will be minimized to the maximum extent possible during final design of the preferred alternative. Mitigation for unavoidable stream impacts will be determined through the permitting process under Sections 404 and 401 of the Clean Water Act as administered by the USACE and KDOW, respectively. Mitigation may include payment to the Kentucky Wetland and Stream Mitigation Fund through the EIU (Ecological Integrity Unit) credit system. According to the KDFWR website, the cost per credit is \$650 in the Big Sandy Service Area (western study area) and \$610 in the Upper Licking Service Area (eastern study area). These costs were used in the total mitigation cost estimates used in Table 14.

3.8.1.3 Floodplains

The Federal Emergency Management Agency (FEMA) Floodplain Map for Rowan County was reviewed for the project area. The study area is located outside the 100-year floodplain within Rowan County. The 100-year floodplain has not been mapped in Elliott County. It is anticipated that no floodplains will be affected by the project.

3.8.1.4 Wetlands and Open Water (Ponds)

This project has been developed in conformity with Executive Order 11990 and USDOT Order 5660.1A. USDA soil survey and National Wetlands Inventory (NWI) maps were used to determine potential wetland areas within the project corridor, and field reconnaissance was conducted per the guidelines of the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0) (USACE, 2012). The *Ecological Report* presented the results of the research and field surveys.

A total of 27 wetlands were identified totaling approximately 2.58 acres within the study area. Impacts to wetlands from the proposed alternatives range from 0.55 acre with Alternative 2A to 1.45 acres with Preferred Alternative 3. Of the 27 wetlands within the study area, the *Ecological Report* notes that 23 are considered jurisdictional. The remaining 4 are considered isolated since they lacked a surface connection or adjacency to a Waters of the U.S. and, therefore, would not be subject to USACE regulatory authority under Section 404 of the Clean Water Act. USACE has not yet made an official determination of the jurisdictional status. Exact determination of impacts to jurisdictional wetlands will be made by KYTC after final design. All wetlands identified within the corridor are classified as emergent due to the lack of woody vegetation rooted within the wetland boundaries.

A total of 36 open water features (ponds) totaling 5.98 acres were identified within the study area. All of the ponds are man-made features created for agricultural or sporting purposes. Pond 29, the largest of the ponds, is managed as a “pay to fish” pond and is regularly stocked with channel catfish. A total of 14 of the ponds are considered jurisdictional (3.58 acres). The remaining 22 ponds (total 2.40 acres) are considered isolated due to the lack of connection to downstream waters of the United States. USACE has not yet made an official jurisdictional determination. Table 15 summarizes potential impacts to wetlands and ponds identified in the *Ecological Report*.

Note: As previously indicated in section 2.3.2, impacts to terrestrial and aquatic resources within the right-of-way appear to be greater for Alternative 3 than those for Alternatives 1A, 1B, and 2A. This is because these three alternatives require fill material from an offsite borrow location(s), and additional impacts at those locations, are not reflected in the impact calculations. The additional impacts to areas outside the rights-of-way of Alternatives 1A, 1B, and 2A cannot be quantified at this time because the location of the borrow site(s) will not be known until just prior to construction.

Wetland mitigation may include payment to the Kentucky Wetland and Stream Mitigation Fund through the AMU (Adjusted Mitigation Unit) credit system. According to the KDFWR website, the cost per credit is \$30,000.

Table 14: Potential Impacts to Wetlands and Ponds

Wetlands / Ponds—Status	Impact (Acres)			
	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 3
Jurisdictional Wetland, Impact (ac)	0.57	0.70	0.50	1.42
Isolated Wetland, Impact (ac)	0.05	0.05	0.05	0.03
Total Wetland Impact (ac)	0.62	0.75	0.55	1.45
Jurisdictional Pond Impact (acres)	2.54	2.91	1.15	0.61
Isolated Pond Impact (acres)	0.27	0.51	0.44	1.43
Total Pond Impact (acres)	2.81	3.42	1.59	2.04

* Jurisdictional status is based on field delineation. USACE has not made an official determination.

3.8.1.6 Wild and Scenic Rivers

No wild and/or scenic rivers designated by state or federal agencies are located in the project corridor.

3.8.2 Terrestrial Ecosystems

The following sections recount the results of the analyses of terrestrial ecosystems presented in the *Ecological Report* prepared for this project.

3.8.2.1 Terrestrial Surveys: Habitat Types, Flora and Fauna

Terrestrial sampling of the project corridor consisted of a delineation of habitat types within the study area, and floral and faunal surveys compiled during site visits to obtain data about the species occurring within the terrestrial habitats. The survey methods and detailed results are documented in the *Ecological Report*. No species-specific survey was performed as part of this study. The results of the surveys are summarized in this section and presented in detail in the *Ecological Report*. Table 16 identifies each habitat type, the acreage of each, and examples of the most abundant floral and faunal species observed.

Habitat Types. The natural terrestrial habitat types identified in the study area are mature woods, young woods, open field/old field, wetlands, open water, and streams. Areas of urban land are also present within the study area consisting of residences, road rights-of-way, and other development.

Table 15: Habitat Types and Acreage, and Dominant Species Within Study Area

Habitat Type	Dominant Species Observed Include...
<p>MATURE WOODS—548 ac. (44.39%) Primarily trees with diameters-at-breast height (dbh) greater than 10 inches. Most common on steep slopes and in stream valleys. Closed canopy with understory of trees and shrubs. Relatively high diversity of vegetation plus canopy gaps allow for a diverse group of plant and animal species. Areas with greater contiguous blocks of this habitat, such as the wooded valleys draining to Laurel Creek and Big Caney Creek, may provide more habitat function than isolated blocks of habitat. Mature woods habitat improves stream habitat by buffering pollutants and lowering stream temperature. Hemlock forests in the steeper stream gorges provide habitat not found elsewhere in the study area; appears to be a remnant of the original vegetation.</p>	<p>Trees and understory: red maple, sugar maple, tulip-poplar, black gum, green ash, and black cherry, eastern hemlock, multiflora rose, Japanese honeysuckle, common greenbrier, Virginia creeper, devil’s darning needles, blackberry, spicebush, Christmas fern, and elderberry.</p> <p>Animals: white-tailed deer, eastern gray squirrel, eastern fox squirrel, eastern chipmunk, northern raccoon, northern cardinal, American crow, blue jay, Carolina chickadee, summer tanager, red-eyed vireo, Kentucky warbler, eastern box turtle, and black rat snake.</p>
<p>YOUNG WOODS—51 ac. (4.13%) Consist primarily of trees with dbh less than 10 inches. Typically have a partially open canopy, dense understory with many young trees and shrubs, and relatively diverse vegetation with a mix of early successional species and forest species. Several areas are fencerows or narrow stream corridors; many</p>	<p>Trees and understory: red maple, sassafras, redbud, tulip-poplar, black locust, Virginia pine, tree-of-heaven, shagbark hickory, blackberry, poison ivy, riverbank grape, and hairy leafcup, Japanese honeysuckle, multiflora rose, and common periwinkle.</p>

<p>areas have a grazed understory. Less diverse age structure and more disturbed vegetation than the mature woods, but provides for diverse group of plant and animal species. Contains numerous, early-successional plant species, which increases vegetation diversity. Improve stream habitat by buffering pollutants and lowering stream temperature.</p>	<p>Animals: white-tailed deer, eastern gray squirrel, eastern fox squirrel, eastern chipmunk, raccoon, northern cardinal, American robin, blue jay, eastern towhee, mourning dove, indigo bunting, house wren, gray catbird, black-and-white warbler, and eastern garter snake.</p>
<p>OPEN FIELD / OLD FIELD—542 ac. (43.90%) Most abundant in flatter upland areas. Consists of pastures, hayfields, residential areas, and agricultural areas that are not dominated by woody vegetation. The second greatest total number of acres within the project study area; consequently, would experience the greatest impact as a result of the project. Provide limited habitat for flora and fauna; have relatively low plant diversity, and do not provide meaningful cover to animals. No unique ecological features, plant communities, plant or animal species, or significant functions identified.</p>	<p>Plants: tall fescue, crabgrass, white clover, Kentucky bluegrass, annual ragweed, red clover, Korean lespedeza, and narrowleaf plantain. Animals: eastern cottontail, woodchuck, American crow, American robin, song sparrow, barn swallow, house finch, brown-headed cowbird, eastern meadowlark, Fowler's toad, and northern fence lizard.</p>
<p>WETLAND—2.58 ac. (0.21%) Dominated by emergent habitat. Its limited extent offers limited value for flora and fauna. However, its presence increases the diversity by supporting locally abundant, hydrophytic plant species. Also provides some functions that may improve water quality for downstream aquatic habitats, and it may provide a water source for animals. No unique ecological features, plant communities, plant or animal species, or significant functions identified.</p>	<p>Plants: soft rush, Frank's sedge, shallow sedge, green bulrush, jewelweed, and rice cutgrass. Animals: eastern cottontail, song sparrow, red-winged blackbird, northern mockingbird, eastern kingbird, green frog, bullfrog, southern two-lined salamander, red-spotted newt, and eastern box turtle.</p>
<p>DEVELOPED LAND—81 ac. (6.56%)</p>	<p><i>(Not specifically recorded during field surveys.)</i></p>
<p>OPEN WATER (PONDS)—5.98 ac. (0.48%)</p>	<p><i>(All ponds manmade for agriculture or stocked for fishing)</i></p>
<p>INTERMITTENT STREAM—2.86 ac. (0.23%)</p>	<p><i>(See Section 3.3.1.2, Aquatic Habitat Sampling—Fish, Macroinvertebrate, and Mussel Surveys)</i></p>
<p>EPHEMERAL STREAM—1.13 ac. (0.09%)</p>	<p><i>(See Section 3.3.1.2)</i></p>
<p>PERENNIAL STREAM—0.08 ac. (0.01%)</p>	<p><i>(See Section 3.3.1.2)</i></p>
<p>TOTAL ACRES: 1,234.63 ac.</p>	

Floral and Faunal Surveys. The floral survey of the study area consisted of both qualitative and quantitative documentation of plant species within three terrestrial habitats. The habitats include mature woods, young woods, and open field/old field. The faunal surveys were conducted for mammals, birds, amphibians, and reptiles. No federally listed or state listed endangered or threatened floral or faunal species were observed during the surveys. Wildlife species inhabiting the habitat areas identified herein have already been impacted by, and adjusted to, previous activities within the corridor (e.g., farming, recreational activities, roadway corridors, residences, and businesses). In addition, the habitat currently being used by these species is plentiful in the surrounding areas. As such, it is unlikely that the proposed project will result in additional long-term, negative impacts such as isolation of populations or loss of significant habitat.

Cave/Rockshelter Surveys. Surface rock within the study area is dominated by sandstone, which is underlain by limestone, coal, and shale; therefore, the study area is characterized as having a low karst potential. No rock shelters, caves, or mine portals were identified during the field survey.

3.8.3 Threatened and Endangered Species.

Early coordination with USFWS, KDFWR, and KSNPC was initiated to determine whether federal and/or state protected species potentially occur within the project area. The following subsections provide information about the federally listed and state listed species identified through agency coordination (see Section 3.8.4) and field observations during the floral and faunal surveys. The amphibian and reptile survey did not identify any federally listed or state listed endangered or threatened species. The listing

designations in the section below are abbreviated as follows: FE/FT (Federal Endangered/Federal Threatened), SE/ST (State Endangered)/State Threatened), FSC (Federal Species of Concern), and SSC (State Species of Concern).

Note: As previously indicated in section 2.3.2, impacts to terrestrial and aquatic resources within the right-of-way appear to be greater for Alternative 3 than those for Alternatives 1A, 1B, and 2A. This is because these three alternatives require fill material from an offsite borrow location(s), and additional impacts at that location(s), are not reflected in the impact calculations. The additional impacts to areas outside the rights-of-way of Alternatives 1A, 1B, and 2A, that would be required for the construction of those alternatives cannot be quantified at this time because the location of the borrow site(s) will not be known until just prior to construction.

MAMMALS

- Virginia big-eared bat (*Corynorhinus townsendii virginianus*)—FE, SE. The mature and young woods habitats represent potential foraging habitat for this species, and the clifflines within the study area represent marginal roosting habitat. Impacts from tree removal will be greatest for Alternative 3 (265 acres) and substantially less for Alternatives 1A, 1B and 2A (69, 188 and 158 acres, respectively).
- Indiana bat (*Myotis sodalis*)—FE, SE. The mature woods habitat represents potential foraging areas and summer roosting habitat for the Indiana bat throughout the study area. The proposed project may result in impacts to the Indiana bat due to the loss of summer habitat, and the project will require coordination with the USFWS. Impacts from habitat tree removal will be higher for Alternative 3 (estimated 318 acres) compared to Alternatives 1A, 1B and 2A (estimated 61, 166 and 141 acres, respectively). No caves, rock shelters, or mine portals were observed in the study area; therefore, impacts to winter habitat are not anticipated as a result of this project.
- Gray bat (*Myotis grisescens*)—FE, ST: The wooded riparian corridors along the perennial streams represent potential foraging habitat for this species. No caves, rock shelters, or mine portals were observed in the study area; therefore, impacts to roost habitat are not anticipated as a result of this project. Alternative 3 will result in greater impacts to perennial streams (755 feet) compared to Alternatives 1A, 1B and 2A (185, 305 and 315 feet, respectively).

Although none of the three types of bats were observed during the mammalian survey, the project area represents potential foraging and marginal roosting habitat for the Virginia big-eared bat, potential foraging and summer roosting habitat for the Indiana bat, and potential foraging habitat for the gray bat. Tree removal from upland woods could have minor impacts to potential foraging habitat for all three species and summer roosting habitat for the Indiana bat. Impacts from habitat tree removal will be higher for Alternative 3 (estimated 318 acres) compared to Alternatives 1A, 1B and 2A (estimated 61, 166, and 141 acres, respectively).

MUSSELS

Two federally listed mussels and two state listed mussels are known to occur in Rowan County. Habitat for these species is not present in the study area; therefore, direct impacts to mussel species are not anticipated as a result of this project. To avoid indirect impacts to these species, KYTC will use appropriate erosion prevention and sediment control measures to avoid downstream sedimentation. Potential impacts to mussel species are assumed to be the same for all four alternatives.

3.8.4 Intergovernmental Coordination

Intergovernmental coordination was initiated early-on in the project development to identify potential impacts to water quality, aquatic and terrestrial habitats, and threatened and endangered species; and to obtain avoidance, minimization, and mitigation options. The results of the coordination, to date, are summarized below. Options identified by the agencies will be provided to the engineering design team to be considered during the final design if a build alternative is selected. Coordination correspondence received from agencies is provided in Appendix A unless otherwise noted.

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). A consultation letter was sent to NRCS District Conservationist in Morehead, Kentucky on October 27, 2010, requesting information regarding hydric soils, prior converted cropland, farmed wetlands, highly erodible soils, and prime farmland in the study area for Rowan and Elliott counties. On December 7, 2010, NRCS provided a letter and mapping indicating soils, prime farmland, hydric soil, and highly erodible soils in the study area. NRCS does not identify prior converted cropland during their soil survey work. A review of the soils within the study area is provided in Section 3.8.2.1, *Geographic and Geophysical Characteristics*.

U.S. Fish and Wildlife Service (USFWS). A consultation letter was sent to the USFWS office in Frankfort, Kentucky, on October 27, 2010, requesting information regarding federally listed species, their critical habitat, including caves and portals, and protected natural areas in the study area. No response has been received to date. USFWS lists for federally endangered, threatened, and candidate species for Elliott and Rowan counties (USFWS, 2008) are in Appendix A, and the data is summarized in Table 17.

Table 16: Federally Listed Species in Elliott and Rowan Counties, Kentucky

Group	Species	Common name	Legal* Status	Known** Potential Elliott County	Known** Potential Rowan County
Mammals	<i>Myotis grisescens</i>	Gray bat	E	K	K
	<i>Myotis sodalis</i>	Indiana bat	E	K	K
	<i>Corynorhinus townsendii virginianus</i>	Virginia big-eared bat	E	P	K
Mussels	<i>Epioblasma torulosa rangiana</i>	Northern riffleshell	E	NA	K
	<i>Lampsilis abrupta</i>	Pink mucket	E	NA	K

Notes:

* Key to notations: E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat

** Key to notations: K = Known occurrence record within the county, P = Potential for the species to occur within the county based upon historic range, proximity to known occurrence records, biological, and physiographic characteristics. NA= Not applicable as species is not listed for this county.

Kentucky State Nature Preserves Commission (KSNPC). A consultation letter was sent to the KSNPC on October 27, 2010, requesting a review of the Natural Heritage Program Database regarding significant resources occurring in the study area. In a letter dated October 29, 2010, KSNPC responded that several listed species are known to occur in the study area. KSNPC noted that Laurel Creek Gorge is “a significant ecological site that harbors several rare aquatic and terrestrial species”; and that the Ed Mabry-Laurel Gorge WMA contains a portion of the site and efforts should be made to avoid impacts to the WMA. The agency listed rare aquatic organisms known to occur in waters near the study area, and recommended that “a written erosion control plan be developed that includes stringent erosion control methods.” The agency also recommended periodic monitoring of the control measures and a survey of impacted streams by a qualified biologist before there is any stream disturbance. KSNPC also listed several protected bat species that are known to occur within 10 miles of the study area, and recommended that a survey for the species be conducted if suitable habitat will be disturbed. The agency

noted: “To avoid impacts to bats, bottomland forests and riparian corridors, particularly near caves, should not be disturbed.”

Kentucky Department of Fish and Wildlife Resources (KDFWR). A consultation letter was sent to the KDFWR office in Frankfort, Kentucky, on October 27, 2010, requesting information regarding listed species or their critical habitat, trout streams/fish spawning areas, or protected natural areas, in the study area. KDFWR replied in a letter dated July 22, 2011, that, while no federally listed species are known to occur within the boundaries of the study area, the state listed trout-perch is known to occur within Big Caney Creek. The agency noted Laurel Creek and Big Caney Creek are listed as Special Use Waters by KDOW and highly recommended avoidance of these areas. Also, both Christy Creek and Laurel Creek run through the Ed Mabry-Laurel Gorge WMA, which KDFWR identified as having “great ecological and recreational value.” KDFWR stocks these streams with trout, and stated: “Streams providing suitable habitat for trout are becoming increasingly rare in Kentucky, and therefore it is imperative to protect habitats that can support this guild.” KDFWR recommended avoidance of the WMA, identification of streams and wetlands in the study area, and minimization of impacts. The agency also recommended “strict erosion control measures be developed and implemented prior to construction to minimize siltation into streams....”

Kentucky Division of Water (KDOW). A consultation letter was sent to KDOW—Water Quality Branch on October 27, 2010, requesting information regarding significant aquatic resources occurring in the study area. In a letter dated November 4, 2010, KDOW responded that two streams of special classification and designation were identified in the project area. Laurel Creek is a Coldwater Aquatic Habitat (CAH) stream from river mile 0.6 to 7.6 (from mouth to Carter School Road Bridge) and a CAH, Reference Reach, and Outstanding State Resource Water (OSRW) from river mile 7.6 to 14.7 (Carter School Road Bridge to the headwaters). Big Caney Creek is a CAH, Reference Reach, and OSRW from river mile 1.8 to 15.3 (Grayson Lake to the headwaters). KDOW stated that CAH and OSRW must be protected per regulation in 401 KAR 10:031. KDOW noted that enhanced Best Management Practices and maintenance of the riparian zone are critical to the temperature regime of a CAH, as well as protection from pollutants carried by stormwater runoff.

A consultation letter was sent to KDOW—Ecological Support Section on October 27, 2010, requesting information regarding any water quality studies that have been performed within the proposed study area. On September 29, 2011, the Ecological Support Section emailed¹⁰ fish, habitat, water chemistry, and macro-invertebrate sampling results for seven sites along Laurel Creek and Big Caney Creek.

Kentucky Division of Forestry (KDOF). A consultation letter was sent to KDOF office in Frankfort, Kentucky, on October 27, 2010, requesting information regarding significant forestry resources, including State Champion Trees and state forests, in the study area. KDOF stated in an undated letter (received on November 9, 2010) that the agency did not find any issues or concerns regarding the forest resources in this area.

Kentucky Geological Survey (KGS). A consultation letter was sent to the Kentucky Geological Survey on November 3, 2010, requesting geologic information about groundwater and geologically significant areas in the project area. In a letter dated November 8, 2010, KGS stated that liability and cost issues prevented it from performing interpretive analyses of specific projects. However, KGS provided several websites to assist in the identification of significant geological areas. A review of important geological information is provided in Section 3.4, *Terrestrial Ecosystems*.

¹⁰ The email is not included in Appendix A.

Kentucky Speleological Society. A request for information regarding the location of local caves and karst features was submitted to the society on October 28, 2012. No response has been received as of the date of this report.

3.8.5 Avoidance, Minimization, and Mitigation

Efforts to avoid and minimize impacts to aquatic and terrestrial ecosystems have been made during the development of the preliminary alternatives and impacts will be minimized to the maximum extent possible during final design should a build alternative be selected. The potential minimization and mitigation options identified by the regulatory agencies will be provided to the engineering design team to consider during the final design if a build alternative is selected.

Mitigation measures for impacts to aquatic habitats, including streams, wetlands, and open water (ponds), will be addressed through the permitting process (see Section 3.9, *Permitting*) and through KYTC's Best Management Practices and Standard Specifications. Mitigation for unavoidable stream and wetland impacts will be determined through the permitting process under Sections 404 and 401 of the Clean Water Act as administered by the USACE and KDOW, respectively. Mitigation is not typically required for open water impacts; however, mitigation requirements will be determined by the USACE and KDOW during the permitting process.

Because the project corridor runs parallel to two Outstanding State Resource Waters, several agencies noted the importance of erosion control and protecting the resources from pollutants in stormwater runoff. In addition to or as a feature of mitigation to be defined in the permitting stage, KYTC commits to implementing enhanced mitigation ("green infrastructure") measures, such as permanent stormwater collection devices/bio-swales within the right-of-way, sized to collect runoff and potential hazmat spill materials from the road.

Mitigation measures for impacts to terrestrial habitats are limited to minimization of impacts to the mature woods habitat. As discussed previously, the more disturbed open field/old field habitat will be impacted to a greater extent. Further mitigation measures are not proposed. Regarding wetlands, due to their ecological functions associated with water quality and water supply, the impacts to wetlands and potential mitigation for the impacts are discussed in Section 3.9, *Permitting*.

Mitigation measures for state and federal threatened or endangered species include minimization of impacts to prime habitat areas, minimization of riparian tree clearing, use of proper equipment staging and fueling areas, and enhanced erosion control measures. Further mitigation requirements for federally protected species will be determined through coordination with USFWS under the Biological Assessment (BA) process. Coordination may also identify the need for the use of an Indiana Bat Conservation Memorandum of Agreement (IBCMOA). Measures to mitigate impacts resulting from the project are further discussed in Chapter 4.0.

3.9 Permitting

All necessary permits will be applied for and obtained prior to the construction of this project, and the terms and conditions of these permits will be adhered to during the construction and maintenance of this facility. Contractors will be required to obtain the necessary permits that are related to their construction practices such as for construction of temporary roads or waste and borrow pits, if necessary.

Water quality impacts from erosion and sedimentation during construction would be controlled in accordance with KYTC's *Standard Specifications* and through the use of Best Management Practices.

Mitigation measures proposed for impacts during construction are addressed in Chapter 4.0, *Mitigation Measures*. The following permits could be required:

404 Permit. Section 404 of the Clean Water Act requires a permit before dredged or fill material may be discharged into “waters of the United States” (*i.e.*, jurisdictional waters, waterways, and wetlands). Under Section 404, U.S. Army Corps of Engineers (USACE) is the agency responsible for administering permit decisions, conducting or verifying jurisdictional determinations, and enforcing Section 404 provisions. There are two major categories of permits that pertain to impacts to jurisdictional waters—*general* and *individual*. Regional General Permits (RGPs) and Nationwide Permits (NWP) are the two types of general permits, and projects qualifying for either must have minimal impacts to waters of the U.S. Projects not qualifying for an RGP or NWP may qualify for an Individual Permit (IP), which is used for larger and more significant impacts to waters of the U.S., and in general is much more involved and takes longer to secure.

If a build alternative is selected and the total area of jurisdictional wetlands within its disturbance limits is greater than 0.5 acre, a USACE Individual 404 Permit will be required. Wetland disturbance acreages falling between 0.1–0.5 acre would potentially qualify for a Nationwide Permit per review by USACE. Wetland disturbance less than 0.1 acre only requires USACE notification. All alternatives considered with this project would have a wetland impact more than 0.5 acre: Alternative 3, the recommended preferred alternative, would potentially impact 1.45 acres; Alternative 1A, 0.62 acre; Alternative 1B, 0.75 acre, and Alternative 2A, 0.55 acre. Therefore, a USACE Individual 404 Permit will be required with any build alternative selected.

401 Water Quality Certification. The Section 401 Water Quality Certification is a state’s review of applications for Section 404 USACE’s permits for compliance with state water quality standards. Because a Section 404 Permit will be required, a Section 401 Water Quality Certification from KDOW would also be required.

Kentucky Pollutant Discharge Elimination System (KPDES) General Stormwater Permit. A KPDES General Stormwater Permit would be required from KDOW because the construction site would be greater than 1.0 acre with the selection of any of the build alternatives.

No-rise Certification and Floodplain Construction Permit. Construction activities in floodplains are regulated by FEMA and, potentially, KDOW permits. Should a build alternative be selected, appropriate regulatory agencies will be consulted regarding potential floodplain impacts, and a floodway analysis will be performed to determine the need for a No-rise Certification and floodplain plan. If required, a floodplain plan would be developed in coordination with FEMA. If filling/wasting in a floodplain is necessary, then a KDOW Floodplain Construction Permit could also be required. The study area is out of the floodplain in Rowan County and floodplain mapping data is not available for Elliott County. It is anticipated that no floodplains will be affected by the project.

3.10 Section 106: Historical Architecture and Archaeological Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800 (Protection of Historic Properties, Revised 11 January 2001) require the Federal Government to take into account the effect of its proposed actions on historic and archaeological properties or resources before making project decisions. Historic and archaeological sites listed in or eligible for the National Register of Historic Places (NRHP) are afforded protection under federal regulations.

In accordance with the procedures contained in 36 CFR Part 800, cultural resource assessments, including background research and field surveys, have been performed for the proposed project to locate

cultural historic resource properties, sites, and structures that may be affected by the proposed project. Phase I archaeological investigations have been conducted to determine whether there are prehistoric and historic archaeological sites within the proposed right-of-way of the preferred alternative that are listed in or eligible for the NRHP. Results of the cultural historic assessments appear in the following reports, which are on file with KYTC:

- *Historic Architectural Eligibility Study (Eligibility Study)*, which identified resources located within the area of potential effects (APE), evaluated their historical significance, identified properties that are listed in the NRHP, and provided an evaluation regarding which other properties within the APE could be determined eligible for listing in the NRHP.
- *Determination of Effects Report (DOE Report)*, which summarized information about NRHP listed and eligible properties and provided a preliminary evaluation of the proposed alternatives' potential effects (i.e., No Effect, No Adverse Effect, or Adverse Effect) on the identified resources.

The sections below discuss the historical resources identified for the project; the Section 106 consulting party process and activities related to this project; potential project impacts and mitigation; and steps to be taken to identify the NRHP listed or eligible archaeological sites that could be affected by the project. Exhibits 1 and 4 show the boundary of the Area of Potential Effect and location of the NRHP listed and eligible cultural historic resources¹¹ in relation to proposed build alternatives. Unless noted, coordination correspondence and related Section 106 documentation referenced herein are in Appendix C.

3.10.1 Area of Potential Effects (APE)

The APE is the “geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist” (36 CFR 800.16(d)). Indirect effects include noise, light, vibrations, aesthetics impacts, etc. On November 17, 2010, FHWA submitted the boundary of the cultural historic APE to the Kentucky State Historic Preservation Officer (SHPO) for review and comment. On December 13, 2010, the SHPO concurred that the APE boundary was appropriate, and appreciated the “comments in the APE attachment that allow for the possibility of revisions to the APE in the future as the project is further developed.”

3.10.2 Public Involvement—Consulting Parties

A key element of the Section 106 process is the involvement of “consulting parties” who have an interest in the historic resource issues associated with the project. According to KYTC and Kentucky FHWA policy there are two types of consulting parties: “by-right” consulting parties and “by-invitation” consulting parties. By-right consulting parties are legally entitled to participate and, for this project, include the SHPO, federally recognized Native American tribes, FHWA, KYTC, and local governments. By-invitation consulting parties may include individual citizens, local historic preservation organizations or interest groups, and federal/state agencies with an interest in the project. By-invitation consulting parties must petition KYTC in writing to formally request to become a consulting party. Participation in the consulting party process for this project was solicited in a variety of ways, including:

- Letters of invitation to be consulting parties to local government officials and other by-right individuals, and owners of historic properties in the area.
- Information provided at the public meeting on February 17, 2011.

¹¹ To protect the integrity of archaeological sites, information regarding their locations is limited and the sites are not shown on exhibits in this Environmental Assessment.

The invitation letters and the information handed out at public meetings generated several responses of interest in participation in the Section 106 process, including requests for consulting party status. There are currently three by-right consulting parties (the SHPO, and representatives of the counties of Elliott and Rowan) and three by-invitation consulting parties. Native American tribes potentially having an interest in the project area will be identified and invited to be consulting parties prior to the initiation of the archaeological investigations that will be conducted should a build alternative be selected.

3.10.3 Historic Architectural Resources

An assessment of cultural historic resources that was conducted for this project included a review of Kentucky Heritage Council files for historic places in Elliott and Rowan counties, and a literature search on the project vicinity. The purpose of this examination was to gather background material to establish the historic themes in the project area. Following the literature research, on-site reconnaissance was conducted in the project area, including a field review that was coordinated with and attended by representatives of KYTC, the Kentucky Heritage Council, and representatives of KYTC and project consultants. The *Historic Architectural Eligibility Study*, completed October 17, 2011, was submitted to the SHPO. The study, which was based on the research and field surveys, identified individual sites, structures, and districts within the project APE that are listed in or potentially eligible for listing in the NRHP. In a letter dated January 13, 2012, the SHPO concurred with the eligibility determinations in the *Eligibility Study*.

On May 24, 2012, a consulting parties meeting was held to provide an overview of Section 106 process and discuss the project APE and sites that are listed in or determined eligible for listing in the NRHP. Consulting party comments were addressed during the meeting and there was general agreement regarding the eligibility determinations. The only written comment submitted following the meeting regarded eligibility of and potential impacts to a property previously determined to be ineligible.

The *Determination of Effects* report was submitted to the SHPO on August 27, 2012. The report presented the findings of the effects (i.e., No Effects, No Adverse Effects, or Adverse Effects) of each build alternative on the NRHP listed and eligible property identified in the *Eligibility Study*. The SHPO concurred with the effects findings in a letter dated October 4, 2012. Table 18 identifies the listed and eligible sites, and the effects findings for each site. The sites are identified on Exhibits 1 and 4.

Table 17: NRHP Listed and Eligible Properties in the Project APE, and Effects Findings

Site ID and acres within site's boundary	Description	Effects Findings, by Alternative
Site Listed in the National Register		
Site RW-15 (0.09 ac):	Hogtown Voting House	• All Alternatives – <i>No Effect</i>
Sites Determined to Meet National Register Criteria		
Site RW-190 (2.01 ac):	Elliottville School	• All Alternatives – <i>No Effect</i>
Site EL-26 (25.68 ac):	Black-Caudill Log House	<ul style="list-style-type: none"> • Alt. 1A (Yellow) – <i>Adverse Effect</i> (7.2 acres and house) • Alt. 1B (Pink) – <i>No Adverse Effect</i> (0.02 acre, <i>de minimis</i>) • Alt. 2A (Red) – <i>No Adverse Effect</i> (0.48 acre, <i>de minimis</i>) • Alt. 3 (Green) – <i>No Adverse Effect</i> (0.5 acre, <i>de minimis</i>)
Site EL-32 (3.8 ac):	H.H. Johnson House/Store	• All Alternatives – <i>No Effect</i>
Site EL-38 (26.64 ac):	Montgomery and Mary Crockett House	<ul style="list-style-type: none"> • Alts. 1A, 1B, 2A – <i>No Effect</i> • Alt. 3 – <i>No Adverse Effect</i> (<i>de minimis</i>, 2.2 acres)
Site EL-51 (1.46 ac):	Concord School	• All Alternatives – <i>No Effect</i>

Indirect and Cumulative Impacts. Indirect impacts occur as a result of changes in land use induced due to the construction of the proposed project. Cumulative impacts occur as a result of past, current, and future projects that alter land uses. Impacts of these types are likely to result in a loss of the historic settings associated with the eligible properties. It is not anticipated that new development induced by the project would occur that would affect NRHP listed or potentially eligible historic sites. Currently no local/regional land use plans indicate future development in the area. It is anticipated that most, if not all, future development would be located along KY 32 and in or around the communities of Elliottville and Newfoundland, at the north and south termini of the project corridor.

Mitigation. As Table 18 shows, Alternative 1A would acquire a residence and land (7.2 acres) from the NRHP eligible Black-Caudill Log House Site (EL-26) resulting in an Adverse Effect determination.

Alternative 3, the recommended preferred alternative, would acquire a minimal (*de minimis*) amount of right-of-way from the Black-Caudill Log House Site (EL-26) and the Montgomery and Mary Crockett House Site (EL-38). The SHPO concurred that there would be no adverse effects to the sites (see Appendix C, correspondence dated October 4, 2012¹²). Alternative 3 would not have an adverse effect to any listed or eligible site along its entire length. Therefore, no mitigation will be required.

3.10.4 Archaeological Resources

The boundary of the archaeological APE, per 36 CFR 800.16(d), has been defined through consultation with the SHPO, as the right-of-way for the preferred alternative. Field investigations were conducted as part of the Phase I archaeological survey within this right-of-way. As a result of the shovel probes conducted as part of the field survey, four archaeological sites were identified.

The draft Phase I Report is currently undergoing revision; therefore, it has not yet been submitted to the SHPO for comment and/or concurrence with the “no further work” recommendation. Chapter 4.0, *Mitigation*, outlines steps that would be taken to address potential impacts as a result of the project, should a site(s) be considered eligible for listing in the NRHP.

3.10.5 Cemeteries

Numerous small cemeteries associated with local families and the settlement of the area are located within the cultural historic APE and some are discussed in the *Historic Architectural Eligibility Study*. None of the cemeteries observed within the APE have been determined eligible for listing in the NRHP.

During the course of the Section 106 consultation, several consulting parties helped locate and provided information about local cemeteries, including some not within the APE. Field visits were conducted to verify their locations, but eligibility determinations were not made for those found to be outside the APE.

Table 19 lists the cemeteries identified during the course of this study and identifies potential impacts. The information is the result of research, the input of consulting parties, and field visits to verify cemetery locations and identify potential effects of the project. The Skaggs-Caudill Cemetery (Site 23) would be within the right-of-way of Alternatives 1B and 2A. It has been determined that, where the potential for impacts exist, alignments might be shifted or other measures could be taken to avoid impacts to the cemeteries. Therefore, should either of these alternatives ultimately be selected, efforts will be made to avoid relocation of the cemetery, if practicable.

¹² The letter inadvertently states that there would be both “No Effect” and “No Adverse Effect” to the sites. The determinations to which the SHPO referred in issuing its concurrence are, in both cases, “No Adverse Effect,” as stated in the *Determination of Effects* report submitted by FHWA to the Kentucky Heritage Council (SHPO), a copy of which is also on file with KYTC.

The cemetery locations are shown on Exhibits 1 and 4 by the identification numbers shown in Table 19.

Table 18: Cemeteries Identified to Determine Potential Impacts

Site ID Number	Cemetery	County	Comments (Includes potential project impact)
1	Roe	Rowan	No impact.
2	Cox	Rowan	No impact.
3	Prince-Lands	Rowan	No impact.
4	Adkins-Trent	Rowan	No impact.
5	Unnamed	Rowan	No impact.
6	Ferguson	Rowan	No impact.
7	Ison	Rowan	No impact.
8	Conn	Rowan	No impact.
9	Mays	Rowan	No impact.
10	Fraley	Rowan	No impact.
11	Barnett	Rowan	No impact.
12	Porter	Rowan	No impact.
13	Adkins	Rowan	No impact.
14	Mays (2)	Rowan	No impact.
15	Brown	Rowan	No impact.
16	Jones	Rowan	No impact.
17	Lyons	Rowan	No impact.
18	E. Fraley	Rowan	No impact.
19	Benjamin Caudill	Rowan	No impact.
20	Cox/Fey-Crockett	Rowan	No impact.
21	J.M. Caudill	Rowan	No impact.
22	Unverified	Rowan	No impact.
23	Skaggs-Caudill	Rowan/Elliott	In right-of-way of Alternatives 1B and 2A
24	Johnson	Elliott	No impact.
25	Johnson Loop	Elliott	No impact.
26	Brown-Porter	Elliott	No impact.
27	Crum	Elliott	No impact.
28	Unnamed	Elliott	No impact.
29	Carter-Keegley	Elliott	No impact.
30	Riley-Conn	Elliott	No impact.
31	Shelton	Elliott	No impact.
32	Unnamed	Elliott	No impact.
33	Unnamed	Elliott	No impact.
34	Unnamed	Elliott	No impact.
35	Unnamed	Elliott	No impact.
36	Unnamed	Elliott	No impact.
37	Unnamed	Elliott	No impact.
38	Unverified	Elliott	No impact.
39	Unverified	Elliott	No impact.
40	Kemplin	Elliott	No impact.
41	Unnamed	Elliott	No impact.
42	Unverified	Elliott	No impact.
43	King	Elliott	No impact.

3.11 Section 4(f) and Section 6(f)

3.11.1 Section 4(f)

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 provides protection for a significant publicly owned park, recreation area, and wildlife or waterfowl refuge; and for significant historic sites listed in or eligible for listing in the NRHP; and archaeological sites listed in or eligible for listing in the NRHP and important for “preservation in place.” Section 4(f) requires that—prior to the use of such protected resources—it must be determined that there are no prudent and feasible alternatives that avoid such use and that the project includes all possible planning to minimize harm to such resources.

USDOT has a review process for Section 4(f) resources potentially impacted by a federally aided transportation project. If it is determined that the project would have a minimal (*de minimis*¹³) impact that would result in a No Adverse Effect finding, the Section 4(f) process is complete. The KY 32 project corridor includes NRHP listed and eligible cultural historic sites, publicly owned recreation areas, and a wildlife management area (WMA). Section 3.10.3, *Historic Architectural Resources*, and Section 3.1.1, subsection “Parks, Recreational Areas, and Wildlife Management Area,” provide details regarding these three resources in relation to the project. The applicability of Section 4(f) evaluations associated with these protected properties is addressed below.

Historic Architectural Sites. The Kentucky SHPO has been consulted on the determination of eligibility and finding of effects for properties within the project APE. In a letter dated October 4, 2012 (see Appendix C) the SHPO concurred with the effects findings presented in the *Determination of Effects* report prepared for this project and on file with KYTC. Table 18 (p.50) identifies the No Effects, Adverse Effects, or No Adverse Effects findings applicable to the alternatives, and the protected properties to which the effects findings apply. The effects findings included:

- Site EL-26 (Black-Caudill Log House)—Adverse Effects with Alternative 1A and No Adverse Effects with Preferred Alternative 3 and Alternatives 1B and 2A.
- Site EL-38 (Crockett House)—No Adverse Effects with Preferred Alternative 3.

In the case of the findings of No Adverse Effects to Sites EL-26 and EL-38, with which the SHPO concurred (see the in October 2012 correspondence), only minimal amounts of land from both would be acquired for right-of-way, FHWA has determined that the *de minimis* rule applies and there would be no Section 4(f) use of historic resources. Exhibits 1 and 4 show the locations of the cultural historic resources identified within the project area.

Publicly Owned Park and Recreation Areas, and Publicly Owned Wildlife Refuge. Three Section 4(f)-protected resources are located in/near the project study area: Grayson Lake State Park, in both Elliott and Carter counties; Daniel Boone National Forest, which encompasses a large part of Rowan County and extends all the way to the Tennessee state line; and the Ed Mabry-Laurel Gorge WMA in Elliott County. Figure 12 shows the locations of these resources in relation to the project corridor. The park and recreation areas are not within the project corridor. The northern tip of the WMA is adjacent to but not within the proposed KY 32 right-of-way. The following agency coordination meetings included discussions of these resources: November 22, 2010 with KDFWR; and April 21, 2011, and February 29, 2012 with KDOW (see meeting minutes, Appendix A). No recreational or park lands or land within the WMA would be acquired to implement any of the build alternatives; therefore, there would be no use related to these Section 4(f) protected resources.

13 *De minimis* impacts related to historic sites are defined as the determination of either "no adverse effect" or "no historic properties affected" in compliance with Section 106 of the National Historic Preservation Act (NHPA).

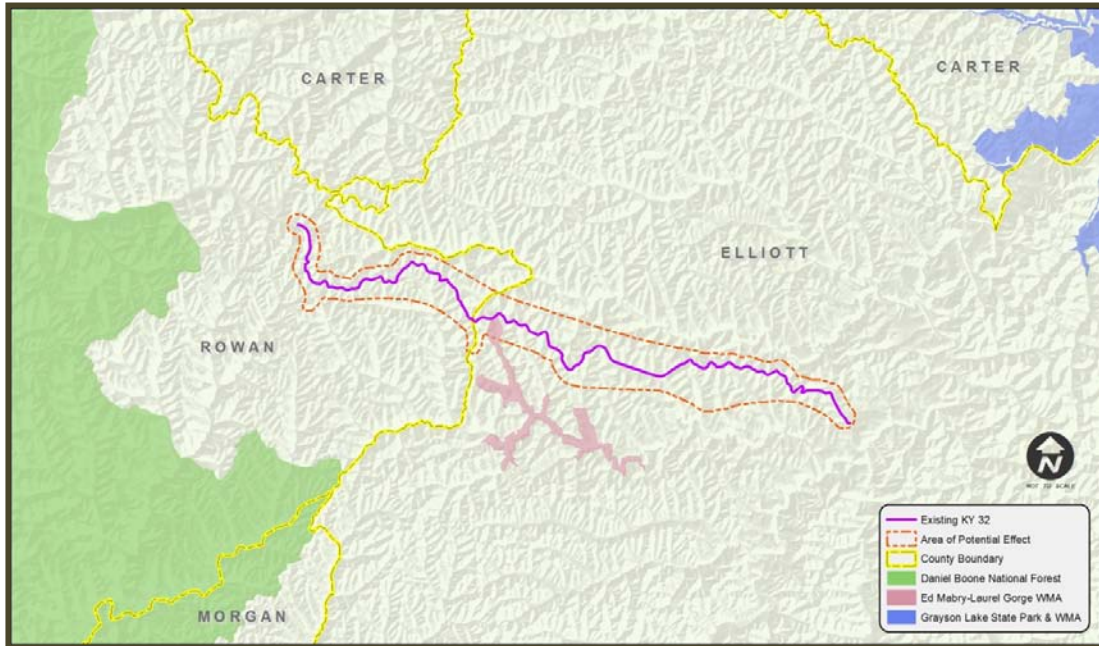


Figure 12: Publicly Owned Park, Recreation, and Wildlife Management Areas

3.11.2 Section 6(f)

Federal Land and Water Conservation Act (LWCA) funds are often used to purchase or improve lands that are used for parks, conservation, recreation, or similar purposes. This program is administered by the U.S. Department of the Interior, National Park Service. Under Section 6(f) of the act, any project that would convert any part of a property improved with LWCA funds to another use must be approved by the Secretary of the Interior. To be approved, the project must demonstrate that equivalent land or facilities have been replaced elsewhere adjacent to the impacted property. No properties purchase or improved with LWCA funds would be affected by any alternatives associated with this project.

3.12 Hazardous Materials

A primary concern when developing a new facility, or improving an existing roadway, is the potential for disturbing hazardous materials sites. It is essential to identify early in the development of a project the hazardous materials site locations. Discovering a hazardous materials site during right-of-way acquisition or construction would have a detrimental impact on the project. The project could be delayed or even halted until a lengthy, detailed, and expensive site evaluation is completed. If identified early in the process, mitigation measures to either eliminate or minimize impacts can be addressed.

Phase I Environmental Site Assessment (ESA). A Phase I ESA was prepared for this project and is on file with KYTC. Table 20 (p.56) provides a summary of the assessment results and recommendations. Coordination with the Kentucky Division of Waste Management Underground Storage Tanks was conducted in September 2012. A government database search report was generated for the Phase I ESA which included a 1-mile diameter search relative to the project, as well as numerous site visits. In addition to the database search reports, letters of inquiry were submitted to select government agencies. Site inspections were initially conducted in February 2010, followed by subsequent site visits through 2011 and 2012. Observations were made relative to environmental issues including, but not limited to: polychlorinated biphenyls (PCBs), underground storage tanks (USTs), aboveground storage tanks

(ASTs), special and hazardous waste, and visible or suspected site contamination. The potential environmental concerns include the following:

Polychlorinated Biphenyls (PCBs)—Several power pole-mounted electrical transformers that may contain polychlorinated biphenyls (PCBs) are found in the project area. Due to the quantity of PCBs typically found in these types of transformers, any releases or associated contamination would be minimal. Fluorescent light fixtures with ballast that may contain PCBs could be located in subject structures, which were inspected only on the exterior during site investigations.

Underground Storage Tanks (USTs)—Information in the government database search report and field visits indicate the presence of two registered underground storage tank (UST) sites adjacent to the existing KY 32. However, the USTs from both sites have since been removed. The field inspection confirmed their locations as well as another potential UST site where any past removal remains unconfirmed. Any or all of them may have an impact on the project, depending on the final design. No vent/fill pipes or any other evidence of unregistered USTs were observed during the site inspection. Due to the age of some structures, however, heating fuel oil USTs could exist on local residential property or farming operations.

Aboveground Storage Tanks (ASTs)—ASTs may be associated with certain residences located in the project area. The investigations for this report did not include an inspection of the interior of subject structures and it is possible that additional ASTs may be located in residential dwellings to store heating fuel oil for boiler systems. A case-by-case survey of those residences to be taken by the selected alignment will determine the prevalence of these tanks.

Solid Waste Disposal and Uncontrolled Dumping—No registered solid waste landfills, transfer stations, or recycling facilities are located within the project area. Due to site conditions, some of the undeveloped and forested areas were not fully inspected during field investigations. These areas, which were viewed only from a distance, could include waste dumps hidden by vegetation. Residential/farm waste dumps could be present within these forested areas on private properties. Where such dumps are encountered, the materials should be recycled or otherwise disposed of properly.

Pesticides / Herbicides—Area farms are likely to use pesticides and herbicides. Pesticides or herbicides pose a hazard if they are improperly disposed of or misapplied. No obvious evidence of chemical misapplication or improper storage of chemicals was observed during investigations. Likewise, no large-scale chemical storage operations were observed in the study area. The inspection of structures was limited to the exterior and there may be materials stored on area farms that that would meet the criteria of hazardous waste.

Site Contamination. During the site reconnaissance, the inspector looked for evidence of current or past site contamination or sources of potential site contamination. Contamination due to leakage of petroleum products from stored or abandoned automobiles is a concern at a few residences adjacent to the existing road. Contamination could include heavy metals, volatile and semi-volatile organic compounds, and other constituents of petroleum-based products. The potential contamination is not considered to be extensive.

Gas Utility. An underground gas pipeline crosses the existing KY 32 roughly halfway between its intersections with KY 504 and KY 173. It is within the disturbance limits of all build alternatives except Alternative 1A. Coordination will occur with the owner of the pipeline before and during construction for proper handling and/or removal or relocation of pipes or pipeline-related appurtenances.

Hazardous Materials Manufacture, Use, Storage, Treatment, Transportation, and Disposal. These activities are regulated by the *Resource Conservation and Recovery Act of 1976 (RCRA)*, as amended by the hazardous and solid waste amendments of 1984. The *Comprehensive Environmental Response,*

Compensation and Liability Act (CERCLA), as amended, is responsible for regulating the control, cleanup, and liability designation for abandoned, uncontrolled, or inactive waste sites. *CERCLA* is also designed to handle hazardous materials discharges and emergencies. The 1986 Amendments of *CERCLA*, also known as the *Superfund Amendments and Reauthorization Act of 1986 (SARA)*, were designed to provide protection against liability for both private and public "Innocent Landowners." This defense was provided for those parties who acquire property without prior knowledge of the presence of hazardous materials, and who made a good faith effort to identify any hazardous materials located on the site prior to purchase. Other federal laws with relevance to the generation, control, disposal, or detection of hazardous materials include NEPA, the *Clean Water Act*, the *Safe Drinking Water Act*, the *Toxic Substances Control Act (TSCA)*, the *Clean Air Act*, and the *Occupational Safety and Health Act (OSHA)*.

The Phase I investigation identified five sites that were within or near the project disturbance limits and were reported as potential hazardous materials site locations. The evaluation of build alternative alignments identified these sites as potentially affecting one or more of the build alternatives. Table 20 identifies those sites by number that could be affected by the project, the potential contaminants at those sites, and recommendations for investigations on sites where right-of-way or an easement is required. Sites 1 – 3 would potentially be impacted by the preferred alternative. Two of which are former UST sites that have had the UST's removed. However, these sites are quite manageable and would not require any realignment of alternatives; therefore no major impacts are anticipated. The sites' locations are shown on Exhibits 1 and 4, and identified by the "Site ID" number in Table 20.

Throughout the project area, sites having utility transformers, asbestos-containing materials (ACMs), residential USTs/ASTs, demolition debris, agricultural chemicals, and other environmental concerns were observed. These impacts would be addressed during the normal right-of-way acquisition process. Further reconnaissance would be required to identify all sites.

Table 19: Suspected Contamination Sites and Recommendations

Site ID	Site Name / Description	Potential Issue(s)	Area of Concern	Recommended (if Area of Concern acquired)	Build Alternative Potentially Affected
1	Natural gas pipeline, underground.	Fire/ explosion hazard if ruptured during excavation.	Location under existing road.	Phase II ESA. Coordinate with pipeline owner prior to ground disturbing activities.	Alts. 1A, 1B, 2, 3
2	Trent's Grocery (closed). Former fuel station; USTs removed 2009.	Possible contamination from petroleum, volatile and semi-volatile organics, heavy metals, and other petroleum constituents.	Locations of removed tanks.	Phase II ESA. Handle and dispose of any contaminated soil according to laws, regulations.	Alts. 1B, 2, 3
3	McBrayer Grocery & Farm Supply. Former fuel station; USTs removed 2012.		Locations of removed tanks.	Phase II ESA. Handle and dispose of any contaminated soil according to laws, regulations.	Alts. 1B, 2, 3
4	Abandoned Store. Former fuel station, potential UST(s) (no closure record).		Location of UST(s).	Phase II ESA. Close tanks and handle and dispose of any contaminated soil according to laws, regulations.	None
5	BP fuel station/ convenience store; USTs.		Location of UST(s).	Phase II ESA. Close tanks and handle and dispose of contaminated soil according to laws, regulations.	None
Not mapped*	Pole-mounted electrical transformers.		PCBs	Location of transformers	Contact electric utility for removal or relocation of transformers, if needed.
Not mapped*	Potential pesticides, herbicides, asbestos, lead-based paint, fuel oil tanks, ASTs.		Locations of contaminants, ASTs.	Identify, evaluate condition of stored pesticides or herbicides. Inspect residences to be acquired for presence of regulated materials. Handle and dispose according to laws, regulations.	To Be Determined
Total					Alt. 1A = 1 Alts. 1B, 2, 3 = 3

Mitigation. Should a build alternative be selected that is affected by a given site, a Phase II hazardous materials investigation will be conducted. Chapter 4.0, *Mitigation*, addresses the steps that would be taken during Phase II investigations.

3.13 Visual Impacts

“Aesthetics” refer to the visual qualities and scenic nature of an area. Studies show there can be individual and regional preferences over what qualifies as “scenic.” The project corridor encompasses a rural environment characterized by steep slopes, rolling terrain, forests, and pastureland. The viewsheds from KY 32 extend many miles to the horizon and present views typical in this region.

Although there are no unique aesthetic features or viewsheds along the project corridor, input received from the stakeholders’ meetings and the public meetings has indicated that the scenic views (see Figure 13) are valuable to the local residents and tourists. The public input has requested that, should the project be constructed, it include opportunities for pull-offs where travelers can park and get out of their cars to enjoy the scenic vistas. If implemented, these areas could provide plaques that inform visitors about the local history and the natural resources. This desire has been included as a goal in the purpose and need of the project. Below are select pictures of the project corridor to illustrate some of the viewsheds.



Figure 13: Vistas Along KY 32

In March 2000, an application to designate KY 32 as a scenic highway was made to KYTC by the local government in Elliott County. Although the application was not approved, it is indicative of the local's value to the scenic viewsheds from the road. The application states: "(KY 32) provides magnificent vistas where the hillsides slope steeply down from both sides of the road.... From the high points along the road you are treated to spectacular panoramic views of farms, hills, woodlands, and distant ridges. The most notable site is at mile 6.5 where a 360 degree vista can be seen."

- View of the Road—While roadway construction would remove some structures (primarily residential and outbuildings) and replace some open ground, trees, and other vegetation, there are no unique aesthetic features or viewsheds potentially impacted by the proposed project.
- View from the Road—Preferred Alternative 3 is primarily on new alignment in the vicinity of the existing KY 32; therefore, its viewshed is similar, i.e., typical of farming areas and pleasantly pastoral. Roadway construction would replace open ground, trees, and other vegetation.

Stakeholders and the public have noted the value of the area's scenic vistas and recommended enhancements such as pullovers along the new roadway, and multi-use paths with associated user facilities along the remaining section(s) of the existing roadway. KYTC commits to considering enhancements and to establishing a stakeholders committee to review Phase II design plans for the potential to include enhancements (see additional information in Section 3.3.3, *Economic Impacts—Taxes and Revenues*).

Recommended Alternative 3 would provide the best opportunity for constructing scenic pullover areas. The other alternatives provide the highest potential for adverse visual impacts due to the need to obtain borrow material offsite but near the construction site. The location and final view of the borrow area would be largely outside the control of KYTC and could result in unsightly areas along the corridor, contrary to

the public desire to enhance the viewshed from the road. The visual impact of the No-Build Alternative would be that associated with increased traffic and congestion on the existing roadway network.

3.14 Construction Impacts

The proposed project is anticipated to produce a beneficial short-term economic impact by stimulating the local economy in terms of construction-related jobs, sales, income, government revenue and expenditures, and other variables. Furthermore, it could be expected to produce a beneficial long-term impact by providing the necessary infrastructure for efficient and safe mobility.

Highway construction activities would also have temporary air, water quality, noise, and traffic flow and associated impacts within the project area. Steps that will be taken to minimize or avoid these temporary impacts are described in Chapter 4.0, *Mitigation Measures*. These steps will be applied to both the construction of the roadway and construction-related activity at any of the borrow sites needed for Alternatives 1A, 1B, and 2A, should one of these be the selected alternative.

4.0 MITIGATION MEASURES

Chapter 3.0 of this Environmental Assessment identifies the impacts for the proposed build alternatives and, where applicable, whether mitigation measures could be expected to result from the project. The following summarizes these impacts and the committed mitigation measures associated with them. The section of this report wherein a subject is discussed is indicated in brackets [0.0] following each category heading, below.

Economic Impacts—Taxes and Revenues [3.3.3] and Visual Impacts [3.13]. In response to stakeholders' and the public's recommendations regarding the tourism benefits offered by scenic vistas in the project area, KYTC commits to considering pullovers along the new roadway and multi-use paths with associated user facilities along the remaining section(s) of the existing roadway; and establishing a stakeholders committee to review Phase II design plans for the potential to include such enhancements. Recommended Alternative 3 would provide the best opportunity for constructing scenic pullover areas and multi-use paths.

Relocations/Displacements [3.4]. All build alternatives would result in the acquisition of residences for right-of-way, as follows: Alternative 1A, 14; Alternative 1B, 20; Alternative 2A, 13; and Preferred Alternative 3, 15. The only business displacement (1) would occur with Alternative 1A, and there would be no institutional displacements. Because Alternative 3 is mostly on new alignment and would attract traffic from the existing road, loss of revenues and closure for some businesses along the existing road could occur. If a build alternative is selected KYTC will implement a program in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646)*, as amended in 1987. Relocation resources will be available to all residential relocatees and business/institutional displacement without discrimination.

A review of the local housing market reveals a limited supply of comparable housing available at any one time. It is anticipated that there could be more relocations than available, affordable residences at any given time; consequently, it is unlikely all the residences could be relocated at the same time. However, over the course of a year or more for relocations, it is possible that sufficient comparable housing would become available when the right-of-way is acquired for this proposed project. Accordingly, it is likely the relocations for this project would be accomplished using normal relocation procedures, and the need for Last Resort Housing should not be anticipated. This program would be used if comparable replacement housing would not be available, or unavailable within the displacee's financial means, and the replacement payment exceeds the state legal limitation.

Streams [3.8.1]. Depending upon the build alternative considered, the linear feet of streams within the construction limits at the alternatives' stream crossings range from approximately 8,540 linear feet with Alternative 1A, which would provide spot improvements to the existing roadway; to 36,915 linear feet with Preferred Alternative 3, which is primarily on new alignment. Alternative 3's impacts include a total of 755 linear feet of two perennial streams—Christy Creek and Big Caney Creek; a total of 21,710 linear feet of 56 intermittent streams; and 14,450 linear feet of 64-four ephemeral streams.

In a letter of July 22, 2011, Kentucky Department of Fish and Wildlife Resources (KDFWR) recommendations included avoidance of Big Caney Creek, which is listed as Special Use Waters by KDOW; and "strict erosion control measures be developed and implemented prior to construction to minimize siltation into streams." Kentucky State Nature Preserves Commission (KSNPC) also called for an erosion control plan in its letter of October 29, 2010. In a letter dated November 4, 2010, Kentucky Division of Water (KDOW) noted that a section of Big Caney Creek is a Cold Water Aquatic Habitat

(CAH), Reference Reach and Outstanding State Resource Water (OSRW) and, therefore, must be protected per regulation in 401 KAR 10:031. KDOW noted that enhanced Best Management Practices and maintenance of the riparian zone are critical to the temperature regime of a CAH, as well as protection from pollutants carried by stormwater runoff. See Section 3.8.5, *Intergovernmental Coordination*, for additional information regarding agency coordination, and Appendix A for copies of the correspondence containing the agencies' comments and recommendations.

Because the project corridor runs parallel to two OSWRs, several agencies noted the importance of erosion control and protecting the resources from pollutants in stormwater runoff. In addition to or as a feature of mitigation to be defined in the permitting stage, KYTC commits to implementing enhanced mitigation ("green infrastructure") measures, such as permanent stormwater collection devices/bio-swailes within the right-of-way, sized to collect runoff and potential hazmat spill materials from the road.

If a build alternative is selected, stream impacts will be minimized to the maximum extent possible during final design. Because avoidance of all stream impacts is not possible with any of the build alternatives evaluated, mitigation for unavoidable stream impacts will be required through the permitting process under Sections 404 and 401 of the Clean Water Act as administered by the USACE and KDOW, respectively. A USACE Individual 404 Permit and KDOW 401 Water Quality Certification would be required with any build alternative selected. Mitigation may include payment to the Kentucky Wetland and Stream Mitigation Fund through the EIU (Ecological Integrity Unit) credit system. According to the KDFWR website, the cost per credit is \$650 in the Big Sandy Service Area (western study area) and \$610 in the Upper Licking Service Area (eastern study area).

If excess fill deposition sites located outside of the project corridor are needed, these areas would be surveyed for potential "waters of the United States." Fill sites (if needed) that would impact a stream deemed by USACE to be jurisdictional will require USACE 404 and KDOW 401 permitting. If this permitting is to be the responsibility of the contractor, the contractor will be made aware of such obligations.

Recommendations identified by the above-referenced regulatory agencies will also be taken into consideration by the engineering team during final design. Water quality impacts from erosion and sedimentation during construction will be controlled in accordance with KYTC's Standard Specifications and through the use of Best Management Practices.

Wetlands and Open Water (Ponds) [3.8.1]. Based on recommendations in the *Ecological Report*, impacts to jurisdictional wetlands are anticipated to range from approximately 1.42 acres with Preferred Alternative 3 to 0.50 acre with Alternative 2A; and impacts to jurisdictional open waters (ponds) are expected to range from 2.91 acres with Alternative 1B to 0.61 acre with Preferred Alternative 3. (See Table 15, p. 40.) USACE will make jurisdictional determinations at the permitting stage of a project.

Wetland impacts will be minimized to the maximum extent possible during final design, should a build alternative be selected. Because avoidance of all impacts to jurisdictional wetlands is likely not possible with any build alternative evaluated, mitigation for unavoidable impacts will be required through the permitting process under Sections 404 and 401 of the Clean Water Act as administered by USACE and KDOW, respectively. A USACE Individual 404 Permit and KDOW 401 Water Quality Certification will be required with any build alternative selected. Mitigation is not typically required for open water (pond) impacts; however, mitigation requirements will be determined by the USACE and KDOW during the permitting process.

Prior to construction (i.e., after final design) KYTC, Division of Environmental Analysis will make an exact determination of impacts to jurisdictional wetlands. Detailed permit coordination—which will identify

specific mitigation measures—will occur with USACE during the final design phase of the project should a build alternative be selected. All wetlands in the project corridor were identified as emergent due to lack of woody vegetation rooted within the wetlands' boundaries. For the loss of emergent wetlands and ponds, mitigation could include creation of small, shallow, seasonally flooded ponds to minimize the loss of these habitats. Ideally, the mitigation would take place on-site if locations with available right-of-way are suitable. If suitable locations are not found onsite, off-site mitigation would be required. Additionally, wetland mitigation may include payment to the Kentucky Wetland and Stream Mitigation Fund through the AMU (Adjusted Mitigation Unit) credit system. According to the KDFWR website, the cost per credit is \$30,000.

See "Streams (3.8.1)," above, for the commitment regarding erosion control and stormwater runoff.

Threatened and Endangered Species [3.8.3]. Three federally protected (endangered) bat species are known to occur in Rowan and Elliott counties, Kentucky—Virginia big-eared bat, Indiana bat, and gray bat. Although no individuals of these species were observed during the field assessment, foraging and/or roosting habitat is present in the project area. Similarly, two federally and state-listed mussel species are known to occur in Rowan County—northern riffleshell and pink mucket. However, no habitat for either mussel species is present in the study area; therefore, direct impacts to these mussel species are not anticipated as a result of this project.

Mitigation measures for threatened or endangered species include minimization of impact to prime habitat areas, minimization of riparian tree clearing, use of proper equipment staging and fueling areas, and enhanced erosion control measures. A Biological Assessment (BA) of the project will be performed prior to right-of-way to determine potential impacts to these federally protected species. The BA, which would be prepared in coordination with USFWS, will identify potential direct, indirect, and cumulative impacts to these species, as well as mitigation measures, should they be required. Coordination may also identify the need for the use of an Indiana Bat Conservation Memorandum of Agreement (IBCMOA).

Historic Architectural and Archaeological Resources [3.10]. If archaeological sites are discovered during construction, the following stipulations must be met:

- Work must cease and the project engineer must be notified immediately.
- Coordination with the Kentucky SHPO will be made to determine the potential eligibility of such sites and whether Phase II testing should be completed.
- If human remains, associated burial items, sacred items, or items of cultural patrimony are discovered, construction in those areas must cease and FHWA will notify and consult with the SHPO, identified Native American tribes, and other parties deemed appropriate by FHWA to determine a specific protocol for treatment, handling and reburial of the remains.

Hazardous Materials [3.12]. The build alternatives could impact several sites that have the potential to contain hazardous materials. Preferred Alternative 3 is estimated to impact three sites (Sites 1 – 3). Two of these sites are former UST sites that have had the tanks removed and the other site is a gas pipeline. These sites are quite manageable and would not require any realignment of alternatives; therefore no major impacts are anticipated. There is, however, limited potential to impact sites scattered throughout the project area but not mapped during this study. These sites include pole-mounted electrical transformers; and area residential/ agricultural properties containing ASTs/USTs, pesticides, herbicides, and other pollutants. These impacts would be addressed during the normal right-of-way acquisition process.

During right-of-way acquisition and/or construction, if a site suspected of containing hazardous materials is discovered, then activities at that site will cease and further investigations must be performed before construction can proceed. Such materials/conditions could include hazardous building materials, soil discoloration, odors, or oily sheen on water.

Construction Impacts [3.14]. Highway construction activities would also have temporary air, water quality, noise, and traffic flow and associated impacts within the project area. Steps that will be taken to minimize or avoid these temporary impacts in accordance with KYTC's *Standard Specifications for Road and Bridge Construction (Standard Specifications)*, as directed by the KYTC project manager.

These steps will be applied to both the construction of the roadway and construction-related activity at any of the borrow sites, should Alternatives 1A, 1B, or 2A be selected.

5.0 COMMENTS AND COORDINATION

FHWA and KYTC have provided opportunities for public involvement and resource agency coordination in the development of this Environmental Assessment. Opportunities for public involvement have included identifying consulting parties for the Section 106 process, and seeking input from the general public. Resource agency coordination has included meetings, field trips, and correspondence. Activities associated with public and resource agency involvement are summarized below. The environmental documentation process involved an extended timeframe to ensure ample opportunities were available for obtaining input from stakeholders and the public. The input received was essential in the identification of notable resources and potential impacts due to the project, insight into local and regional needs and plans, and feedback on alternatives that, ultimately, were advanced for evaluation in this Environmental Assessment. The environmental documentation process will not conclude nor will an alternative be selected until a Public Hearing has been held and all comments have been given consideration.

5.1 Public Involvement Activities

Stakeholders Meetings. Elected officials representing local, state, federal governments were invited to participate in the stakeholder meetings for the KY 32 project. Other key civic leaders from Elliott and Rowan counties also were invited to participate. One or more of the meetings were attended by local residents, representatives of KYTC; and project consultants. The meetings that have been held, to date, are summarized below.

January 27, 2011—The first meeting included an overview of the project, engineering and environmental tasks to be undertaken, anticipated schedules, and current and anticipated funding; an outline of information to be presented at the first public meeting; and proposed presentation of project data. An exercise was held to help the attendees identify their priorities for the KY 32 project.

February 25, 2011—The second meeting was held to update participants about the project status, including the development of project alternatives, the environmental analyses activities, and the results of the February 17 public meeting.

September 7, 2011—The third meeting focused on a summary of activities since the previous meeting, a review of preliminary alternatives being advanced for detailed evaluation, and an environmental overview.

November 1, 2012—The fourth meeting consisted of presenting a complete project overview to date, including a comprehensive view of the environmental and planning process as well as the recommended alternative.

Public Meetings. Two public meetings have been held. The following paragraphs summarize the conduct and results of each meeting.

February 17, 2011—The first public meeting was held in Elliottville at the Elliottville Church. 139 people signed in at the “open house” format meeting. Aerial photographs showing the preliminary alternatives were displayed for review, and project staff were on hand to help identify properties, explain project alternative alignments, and answer questions from the public. Midway through the open house, a presentation was given to describe the project, the status of environmental and design tasks, funding, and schedules; and to request the public’s input on existing conditions/features that could impact the roadway design process. The Section 106 “consulting party” process was explained and participation solicited. Application forms for consulting party status were available. Meeting handouts also included a brochure summarizing the project and purpose of the meeting; and a questionnaire asking for input regarding

problems with KY 32 that need to be addressed, places/activities that should be connected with KY 32, and local resources/areas/issues that should be considered during project development. Approximately 57 questionnaires were returned.

October 27, 2011—The second public meeting was held in Sandy Hook to present alignment alternatives and solicit comments from the public: 121 visitors signed in at the meeting. Once again, the meetings followed an “open house” format, with a formal presentation given mid-way through the meeting to explain the status of the environmental tasks and alternatives evaluation process since the previous meeting. Meeting handouts included a questionnaire that contained a request for input regarding preferences of alternatives presented at the meeting. Questionnaires/comment cards returned after the meeting indicated 58.1% favored advancing Alternative 3 further study versus 36.4% for Alternative 1B, 25.5% for Alternative 2A, and 65% for Alternative 1A (which has had public support but does not meet the project’s purpose and need. These alternatives were advanced for evaluation in this Environmental Assessment. (See Section 2.3.2 for discussion of the reasons for recommending Alternative 3 as preferred and not recommending the other alternatives.)

Consulting Party Consultation. A consulting parties meeting was held on May 24, 2012, and attended by the consulting parties, local elected officials, representatives of the Kentucky Heritage Council (SHPO), KYTC, and the project consultants. An overview of the Section 106 process was presented as well as the project APE and sites that are listed or believed to be eligible for listing in the National Register of Historic Places. The minutes for this meeting are included in Appendix C.

Other Public Involvement. January 29, 2013—KYTC sent a letter to property owners within the project corridor noting that the project is advancing and the Public Hearing is expected in Spring 2013 following approval of the Environmental Assessment. The correspondence included a newsletter in which the preliminary preferred alternative, Alternative 3, was identified and the primary reasons for its recommendation were listed. The newsletter also explained that an archaeological survey of the proposed Alternative 3 right-of-way and easement areas is required as part of the environmental evaluation process. It was further explained that archaeologists may require access to private properties to obtain field data, and a summary of the types of activity that could be expected was provided.

5.2 Interagency Coordination and Consultation

Coordination has occurred with the resource agencies and organizations identified in Table 21. Coordination correspondence and other project-related documentation received from responding agencies are provided in Appendix A, except those related to Section 106, which are in Appendix C.

Table 20: Coordination with Resource Agencies and Organizations

Agency/Organization	Coordination Date / Type	Agency Response / Other Actions	Location
Resource Agencies			
USDA—Natural Resources Conservation Service	October 27, 2010 letter requesting information re: soils, converted cropland, farmed wetlands, prime farmland.	December 7, 2010 letter of response and mapping identifying areas requested.	EA Append. A
USDOI—Fish and Wildlife Service	October 27, 2010 letter requesting information re: federally listed species.	No response. Obtained species list for counties from USFWS website; data included in <i>Ecological Assessment Report</i> (Aug. 2012).	Report on file: KYTC-DEA*
KY Div. of Water— Water Quality Branch	October 27, 2010, letter requesting information regarding significant aquatic resources. April 21, 2011, meeting re: Laurel and Big Caney creeks (exceptional waters) February 29, 2012, meeting re: project update, permits, Mabry WMA, impacts to water resources.	November 4, 2010, letter of response identifying two resources. Meeting minutes. Meeting minutes.	EA Append. A
	Ecological Support Section	October 27, 2010, letter requesting information re: water quality studies.	September 29, 2011, emailed sampling results for 7 sites. N/A
KY Dept. of Fish and Wildlife Resources	October 27, 2010, letter request re: threatened/endangered species; habitat, trout streams/spawning areas, protected natural areas. November 22, 2010, meeting re: potential impacts to Mabry WMA February 29, 2010, meeting re: (see above)	July 22, 2011, letter of response providing information requested and recommending protection measures. Meeting minutes Meeting minutes	EA Append. A
KY Dept. for Natural Resources—Division of Forestry	October 27, 2010, letter requesting information re: significant forestry resources.	Undated letter of response noting no issues or concerns in project area.	EA Append. A
KY Geological Survey	November 3, 2010, letter requesting geologic information.	November 8, 2010, letter of response providing research websites; data included in "Ecological Assessment Report" (Aug. 2012).	Report on file: KYTC-DEA*
KY Heritage Council, State Historic Preservation Officer	November 17, 2010, letter submitting APE to SHPO for review, concurrence. October 17, 2011: <i>Eligibility Report</i> prepared for SHPO for review, concurrence. January 26, 2012, letter submitting to SHPO names of two people requesting consulting party status. May 24, 2012: Consulting parties meeting. August 27, 2012, letter submitting <i>Determination of Effects</i> report to SHPO for review, concurrence.	December 13, 2010 SHPO letter noting APE to be adequate. January 13, 2012, SHPO letter concurring with determinations of eligibility. February 23, 2012, SHPO letter concurring with requests. KHC (SHPO) representatives attended. Meeting minutes prepared. October 4, 2012, SHPO letter concurring with effects findings.	EA Append. C
KY State Nature Preserves Commission	October 27, 2010 letter requesting Natural Heritage Program Database data re: threatened, endangered, special concern species.	October 29, 2010, letter of response providing information requested and recommending protection measures.	EA Append. A
Other			
KY Speleological Society	October 28, 2012, letter requesting cave/karst information.	No response to date.	Report on file: KYTC-DEA*
Morehead State University Graduate Research	Bioassessment research by MSU student identified during stakeholders' meetings.	Thesis obtained from MSU library for review of water quality sampling sites.	N/A

* These reports were prepared as baseline studies for use in this Environmental Assessment. As noted, the reports are on file with the KYTC Division of Environmental Analysis in Frankfort, Kentucky.