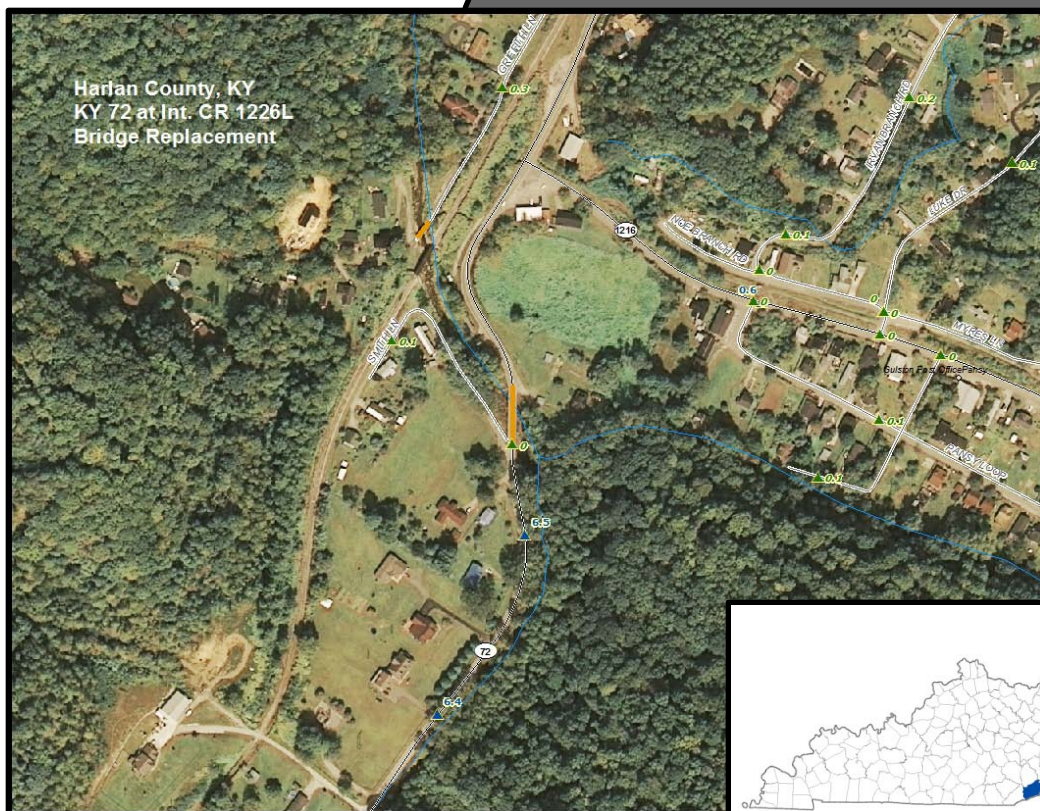


# Data Needs Analysis



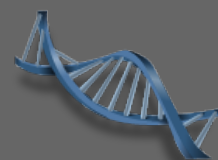
## Scoping Study



KY 72, Harlan County  
Replace Bridge over Catron  
Creek at Intersection of KY  
72 and Smith Lane  
Item No. 11-1087.00

Prepared by the KYTC  
Division of Planning  
District 11

July 2012



## I. PRELIMINARY PROJECT INFORMATION

County:	Harlan	Item No.:	11-1087
Route Number(s):	KY 72	Road Name:	Catrons Creek Road
Program No.:	86579	UPN:	048 0072 006-007
Federal Project No.:	BRO 1103 254	Type of Work:	BRIDGE REPLACEMENT

2012 Highway Plan Project Description:

REPLACE BRIDGE ON KY 72 OVER CATRON CREEK AT INTERSECTION OF KY 72 AND SMITH LANE

Beginning MP:	6.4	Ending MP:	6.7	Project Length:	0.3
Functional Class.:	<input type="checkbox"/> Urban <input checked="" type="checkbox"/> Rural	State Class.:	<input type="checkbox"/> Primary <input checked="" type="checkbox"/> Secondary		
	Local <input type="button" value="v"/>	Route is on:	<input type="checkbox"/> NHS <input type="checkbox"/> NN <input type="checkbox"/> Ext Wt		
MPO Area:	Not Applicable <input type="button" value="v"/>	Truck Class.:	A <input type="button" value="v"/>		
In TIP:	<input type="checkbox"/> Yes <input type="checkbox"/> No	% Trucks:	10.4		
ADT (current):	<u>1,311</u> 2009	Terrain:	Rolling <input type="button" value="v"/>		
Access Control:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Permit <input type="checkbox"/> Fully Controlled <input type="checkbox"/> Partial	Spacing:	<input type="button" value="v"/>		
Median Type:	<input checked="" type="checkbox"/> Undivided <input type="checkbox"/> Divided (Type):				
Existing Bike Accommodations:	Shared Lane <input type="button" value="v"/>	Ped:	<input type="checkbox"/> Sidewalk		
Posted Speed:	<input checked="" type="checkbox"/> 35 mph <input type="checkbox"/> 45 mph <input type="checkbox"/> 55 mph <input type="checkbox"/> Other (Specify):				
KYTC Guidelines Preliminarily Based on :	<u>40</u> MPH Proposed Design Speed				

### COMMON GEOMETRIC

Roadway Data:	EXISTING	PRACTICES*	
No. of Lanes	<u>2</u>	<u>2</u>	<a href="#">Existing Rdwy. Plans available?</a> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Lane Width	<u>9</u>	<u>10</u>	
Shoulder Width	<u>2</u>	<u>5</u>	Year of Plans: <u>1935</u>
Max. Superelevation**	<u>n/a</u>	<u>6%</u>	<input checked="" type="checkbox"/> <a href="#">Traffic Forecast Requested</a>
Minimum Radius**	<u>395</u>	<u>380</u>	Date Requested: <u>6/4/2012</u>
Maximum Grade	<u>n/a</u>	<u>10%</u>	<input type="checkbox"/> Mapping/Survey Requested
Minimum Sight Dist.	<u>&lt;1500</u>	<u>250</u>	Date Requested: <u></u>
Sidewalk Width(urban)	<u>n/a</u>	<u>n/a</u>	Type: <input type="button" value="v"/>
Clear-zone***	<u>n/a</u>	<u>14</u>	

Project Notes/Design Exceptions?: Expected bridge width to match mainlane.

\*Based on proposed Design Speed, \*\*AASHTO's A Policy on Geometric Design of Highways and Streets, \*\*\*AASHTO's Roadside Design Guide

Bridge No.*:	<u>048B00030N</u>	<a href="#">Existing Geotech data available?</a> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sufficiency Rating	<u>30</u>	
Total Length	<u>140</u>	*If more than two bridges are located on the project, include additions sheets.
Width, curb to curb	<u>19'8"</u>	
Span Lengths	<u>45,45,45</u>	
Year Built	<u>1964</u>	
Posted Weight Limit	<u>None</u>	
Structurally Deficient?	<u>No</u>	
Functionally Obsolete?	<u>Yes</u>	

## II. PROJECT PURPOSE AND NEED

### A. Legislation

The following funding was listed in the FY 2012-FY 2018 Highway Plan.

<i>Funding</i>	<i>Phase</i>	<i>Year</i>	<i>Amount</i>
BRO	D	2013	\$400,000
BRO	R	2014	\$50,000
BRO	U	2014	\$50,000
BRO	C	2015	\$1,300,000

### B. Project Status

Design funds for this project have been requested. There is currently a project on the Unscheduled Needs List (UNL) that addresses congestion/capacity issues on KY 72 from Upper Branch Road to US 421 (MP 4.671-10-913).

### C. System Linkage

This segment of KY 72 connects the communities of Liggett, Bardo , and Stanfill to the City of Harlan and US 421. It is classified as a Rural Local Route.

### D. Modal Interrelationships

Approximately two miles South of the KY 72 bridge, there is a coal mine and railroad. Trucks from various mines haul coal to this site to ship out of the area.

### E. Social Demands & Economic Development

A coal mine is located approximately two miles past this project, just past the community of Liggett.

### F. Transportation Demand

The last actual traffic counts for this section from HIS has an ADT of 1311 from 2009.

## II. PROJECT PURPOSE AND NEED (cont.)

### G. Capacity

There is sufficient capacity along this section of KY 72. However, the bridge is structurally deficient and warrents replacement.

### H. Safety

Collisions may be seen in Exhibit 3. Collision data was obtained from the Kentucky State Police database for the years ranging from January 1st, 2009 to December 31st, 2011. The CRF for this section of KY 72 is 0.218. There are three accidents over the last three years in the vicinity of the bridge. Two of the accidents were single vehicle collisions and one was a side swipe collision.

### I. Roadway Deficiencies

The bridge is classified as functionally obsolete. According to the Structure Inventory and Appraisal Sheet, the bridge received an intolerable rating for the deck geometry. KY 72 has several sharp curves both north and south of the bridge. These may be improved as part of the bridge project.

### Draft Purpose and Need Statement:

Need: This bridge is functionally obsolete with a sufficiency rating of 30.

Purpose: By replacing the bridge, this section of KY 72 is more safe and reliable for the local community.

### III. PRELIMINARY ENVIRONMENTAL OVERVIEW

#### A. Air Quality

Project is in: ☒ Attainment area ☐ Nonattainment or Maintenance Area ☐ PM 2.5 County

STIP Pg. #: 52

TIP Pg. #:

Harlan Co is attainment for all monitored air pollutants. This project is a bridge replacement and no increase in traffic is expected. Air quality during construction will be controlled with good construction practices.

#### B. Archeology/Historic Resources

☐ Known Archeological or Historic Resources are present

A phase I archaeological survey will determine cultural significance and if eligible sites are located in the project footprint. The bridge, the bungalow to the north and the small house to the south are possible historic resources and significance will be determined.

#### C. Threatened and Endangered Species

Current T&E species listed for Harlan County, USGS Harlan quadrangle, are Myotis sodalis, Indiana bat, Myotis grisescens, gray bat and Phoxinus cumberlandensis, blackside dace. This bridge will cross Catron Creek. Future study will address the requirements of USFWS and prevent detriment to the protected species.

#### D. Hazardous Materials

☐ Potentially Contaminated Sites are present ☒ Potential Bridge or Structure Demolition

Fueling stations or where petroleum products have been used can be identified for hazardous materials during phase I investigations and determine if phase II will be necessary. Asbestos and lead are possible hazardous materials in structures and these will be assessed during the environmental phase.

#### E. Permitting

Check all that may apply: ☒ Waters of the US ☐ MS4 area ☐ Floodplain Impacts ☐ Navigable Waters of the US Impacts  
Are 401/404 Permits likely to be required? ☒ Yes ☐ No Impacts to: ☐ Wetlands ☒ Stream/Lake/Pond  
☒ ACE LON ☒ ACE NW ☐ ACE IP ☐ DOW IWQC ☐ Special Use Waters

The USGS Quadrangle is Harlan. Wetlands are not identified on the project. A water of the United States with impacts below ordinary high water will require coordination with the officers of the CORP and DOW. Construction activities may need a USACE 404 permit and a DOW 401 permit. Additionally, a surface water KYR 10 permit may be required for construction disturbance.

#### F. Noise

Are existing or planned noise sensitive receptors adjacent to the proposed project? ☒ Yes ☐ No  
Is this considered a "Type I Project" according to the [KYTC Noise Analysis and Abatement Policy?](#) ☐ Yes ☒ No

Noise issues will be temporary and limited to those associated with construction activity. It does not appear there are noise receptors within 150 feet of the project. Project will not increase capacity or through travel lanes.

#### G. Socioeconomic

Check all that may apply: ☐ Low Income/Minority Populations affected ☒ Relocations ☐ Local Land Use Plan available

Relocations are possible as the geometrics of the road are addressed along with the bridge replacement. There appears to be no impacts to prime farmland.

#### H. Section 4(f) or 6(f) Resources

The following are present on the project: ☐ Section 4(f) Resources ☐ Section 6(f) Resources

Should structures be accepted as eligible for the National Register of Historic Places, they could be afforded protection under Section 4(f). KYTC has options to mitigate and avoid impacts to section 4(f) resources including a programmatic agreement for mitigating historic bridges, or using 'de minimus' guidance for properties with minor strip takings



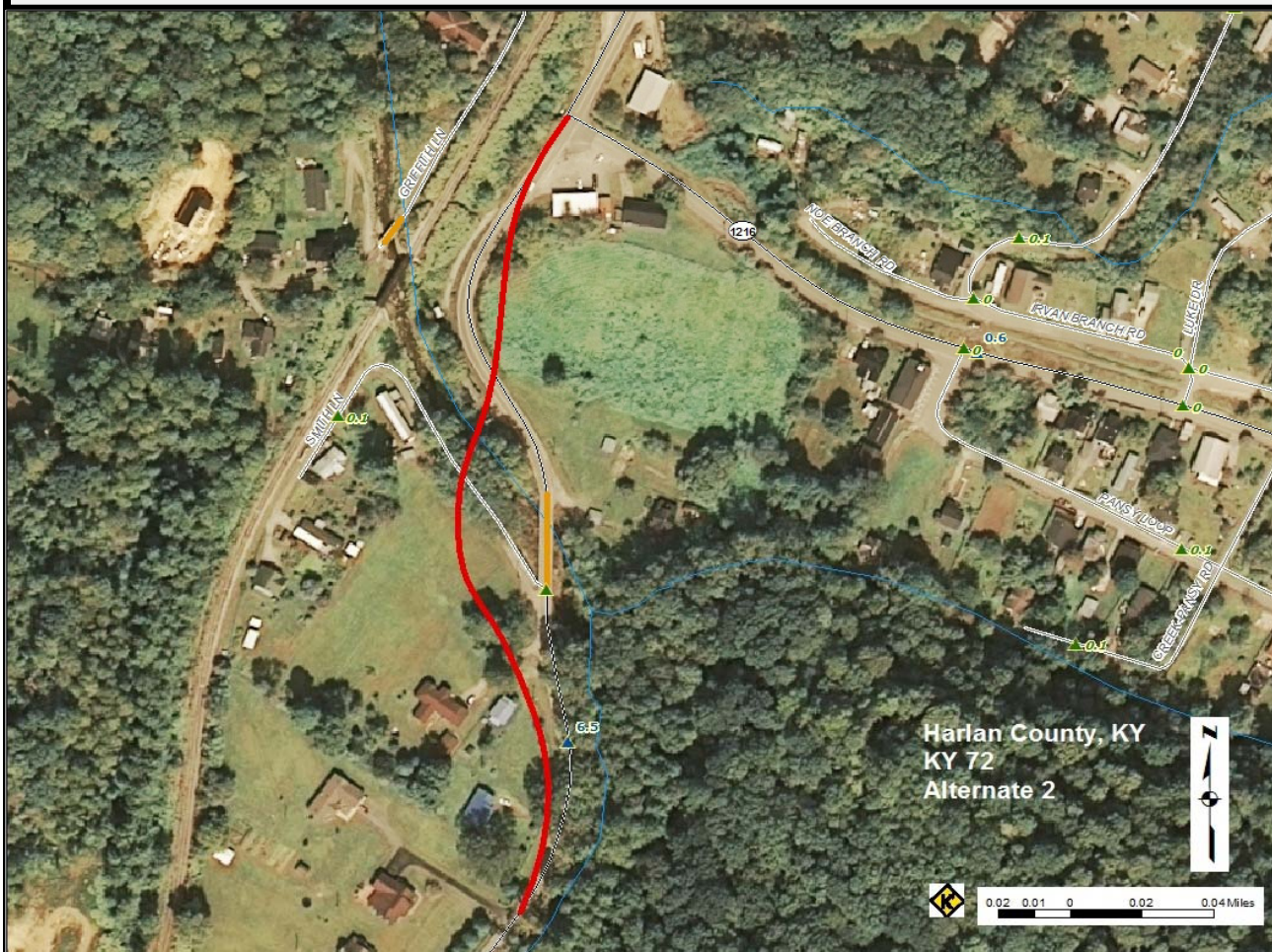
#### IV. POSSIBLE ALTERNATIVES

##### A. Alternative 1: No Build

This alternate could be carried forward, but does not address the need to replace a the bridge that is functionally obsolete. If the bridge was closed, the residents who lived on the South of the bridge would have no access to US 119.

##### B. Alternative 2: New Bridge Downstream with a New Alignment

Alternative 2 moves the bridge downstream to the west. The structure length would be reduced; however approach work would be required. This would allow the section north of the bridge to improve on the sharp curve just before the bridge. However, to tie the southern section into the new bridge location, several homes may be affected.



##### Planning Level Cost Estimate:

<u>Phase</u>	<u>Estimate</u>
Design	\$400,000
R/W	\$200,000
Utilities	\$50,000
Const	\$900,000
<b>Total</b>	<b>\$1,550,000</b>



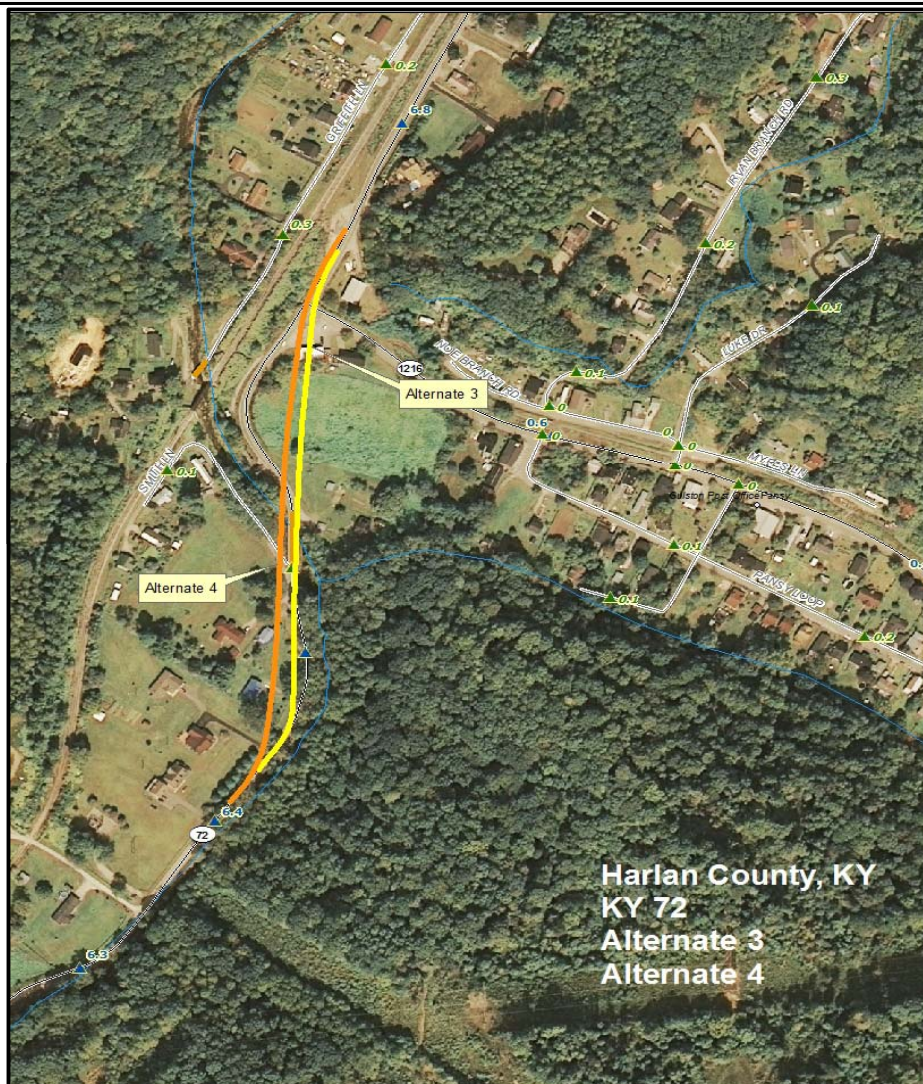
#### IV. POSSIBLE ALTERNATIVES (cont.)

### B. Alternative #3: Build In-Place with Diversion

Alternate 3 will replace the bridge in the same location as it is now. However, it will correct several geometric deficiencies in the sections of KY 72 tying into the bridge. The north section will be realigned to the bridge beginning at the intersection of KY 1216. It will affect at least one property on the northern side. Slight geometric improvements can be achieved on the southern side of the bridge. Several properties will be affected with the southern alignment of KY 72 and tying in with Smith Lane.

### C. Alternative #4: Build New Bridge with a New Alignment Parallel to the West

Alternate 4 will realign the bridge parallel to the west of the existing bridge. The alignment of the roadway for Alternate 4 is very similar to Alternate 3. However, more right of way impacts are anticipated.



**Planning Level Cost Estimate:**

	Alternate 3	Alternate 4
<u>Phase</u>	<u>Estimate</u>	<u>Estimate</u>
Design	\$400,000	\$400,000
R/W	\$200,000	\$245,000
Utilities	\$50,000	\$50,000
Const	\$1,500,000	\$1,500,000
<b>Total</b>	<b>\$2,150,000</b>	<b>\$2,195,000</b>

### V. Summary

This study is a Data Needs Analysis (DNA) of a bridge replacement over Catron Creek on KY 72 in Harlan County, Item Number 11-1087. Through analysis of the existing roadway geometrics, site visits, and discussion with the project team, several needs were identified within the project limits. The following were identified as project needs:

- The bridge needs replaced.
- The new bridge cannot be shifted toward the east, due to another stream tying into Catron Creek adjacent to the existing bridge.
- The roadway north and south of the bridge has sharp curves tying into the bridge. These could be improved when the bridge is reconstructed.

Included in the alternates were a no build recommendation, shifting the bridge to the west, replacing the bridge in its current location, and constructing the bridge parallel to the existing location.

Alt #	Description	D (\$)(BRO)	R (\$)(BRO)	U (\$)(BRO)	C (\$)(BRO)	Total
1	No Build	-	-	-	-	-
2	New Bridge Downstream	400,000	200,000	50,000	900,000	\$1,550,000
3	Build In-Place with Diversion	400,000	200,000	50,000	1,500,000	\$2,150,000
4	Build New Bridge to the West	400,000	245,000	50,000	1,500,000	\$2,195,000
-	Current Hwy Plan Estimated Cost	400,000	50,000	50,000	1,300,000	\$1,800,000
-	Current Pre-Con Estimated Cost	400,000	2,450,000	50,000	1,500,000	\$2,195,000

### VI. Tables and Exhibits

#### Exhibit 1: Mainline Northbound





**Exhibit 2: Barrier Wall beside Smith Lane**



**Exhibit 3: Collisions on KY 72**

