

**D**ata

**N**eeds

**A**nalysis



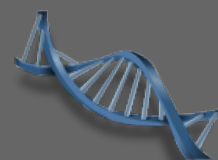
## Scoping Study



US 421, Jackson County  
Replace Bridge on US 421 over  
Pigeon Roost Creek at Junction  
with Water Street  
Item No. 11-1090.00

Prepared by the KYTC  
Division of Planning District 11

September 2012



## I. PRELIMINARY PROJECT INFORMATION

County: Jackson Item No.: 11-1090.00  
Route Number(s): US 421 Road Name:  
Program No.: UPN: (Function) (County #) (Route) (MPs)  
Federal Project No.: Type of Work: Bridge Replacement  
2014 Highway Plan Project Description: Bridge Replacement

Replace bridge on US 421 over Pigeon Roost Creek at intersection with Water Street E (CS 1006)

Beginning MP: 13.919 Ending MP: 13.959 Project Length: 0.04  
Functional Class.: ☐ Urban ☒ Rural  
Arterial ☐ State Class.: ☒ Primary ☐ Secondary  
Route is on: ☐ NHS ☐ NN ☐ Ext Wt  
MPO Area: Not Applicable Truck Class.: AAA  
In TIP: ☐ Yes ☐ No % Trucks: 5.8  
ADT (current): 7992 (2011) Terrain: Rolling  
Access Control: ☐ None ☒ Permit ☐ Fully Controlled ☐ Partial Spacing:  
Median Type: ☒ Undivided ☐ Divided (Type):  
Existing Bike Accomodations: Shared Lane Ped: ☐ Sidewalk  
Posted Speed: ☒ 35 mph ☐ 45 mph ☐ 55 mph ☐ Other (Specify):  
KYTC Guidelines Preliminarily Based on : 45 MPH Proposed Design Speed

### COMMON GEOMETRIC

Roadway Data:	EXISTING	PRACTICES*
No. of Lanes	2	2
Lane Width	11	12
Shoulder Width	3	8
Max. Superelevation**	--	8%
Minimum Radius**	1500	600
Maximum Grade	2%	6%
Minimum Sight Dist.	--	360
Sidewalk Width(urban)	4	4
Clear-zone***	--	20

Existing Rdwy. Plans available?  
☒ Yes ☐ No  
Year of Plans:  
☒ Traffic Forecast Requested  
Date Requested: 9/19/2012  
☐ Mapping Requested  
Date Requested:  
Type:

Project Notes/Design Exceptions?:

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

Bridge No.\*: 055B0003N  
Sufficiency Rating 33  
Total Length 41.0'  
Width, curb to curb 23.6'  
Span Lengths 37.0'  
Year Built 1928  
Posted Weight Limit at/above legal loads  
Structurally Deficient? yes  
Functionally Obsolete? no  
Existing Geotech data available?  
☐ Yes ☒ No

## II. PROJECT PURPOSE AND NEED

### A. Legislation

The following funds was listed in the 2012 General Assembly's Enacted Highway Plan.

<i>Funding</i>	<i>Phase</i>	<i>Year</i>	<i>Amount</i>
BRO	D	2014	\$300,000
BRO	R	2015	\$100,000
BRO	U	2015	\$50,000
BRO	C	2016	\$555,000

### B. Project Status

Design funds for this project have been requested. There is currently a project on the Unscheduled Needs List (UNL) that addresses reconstruction of US 421 from KY 89 to KY 587 (MP 10.802-14.808). This project is for the replacement of a structurally deficient bridge along US 421 at Mile Point 13.939.

### C. System Linkage

US 421 is the primary corridor for residents in Jackson County. This bridge is located just east of town. It is of vital importance for residents who live in the area and those who use this corridor to travel across Jackson County between Clay County and Madison County.

### D. Modal Interrelationships

This section of US 421 has no know modal interrelationships.

### E. Social Demands & Economic Development

US 421 is the primary route for social and economic development in Jackson County. Two tenths of a mile east of the project, Jackson County recently opened its new high school located on Educational Mountain Drive.

### F. Transportation Demand

The last actual traffic counts for this section of US 421 has an ADT of 7992 in 2011 with 5.80% trucks. According to the traffic volume history, this section had a peak traffic count in 1995 of 9,300 ADT. There has been a steady drop until 2008, but has since increase over the last four years. A traffic forecast has been requested.

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

### G. Capacity

There is sufficient capacity along this section of US 421. However, the bridge is structurally deficient and warrents replacement.

### H. Safety

There have been two accidents over the three year time span 01/01/2009-12/31/2011 on this bridge. These can be seen in Exhibit 3.

### I. Roadway Deficiencies

The bridge is classified as structurally deficient. According to the 01/24/2012 Structure Inventory and Appraisal Sheet, the bridge received an intolerable rating for deck geometry. From the site visit, the project team observed sections of exposed steel and cracked and falling concrete.

### Draft Purpose and Need Statement:

Need: This bridge is structurally deficient. It has a sufficiency rating of 33. With an intolerable rating on the deck and visual decay upon inspection, this bridge needs replaced.

Purpose: By replacing the bridge, US 421 in Jackson County will allow safer and more reliable access for the City of McKee and entire Jackson County community.

### III. PRELIMINARY ENVIRONMENTAL OVERVIEW

#### A. Air Quality

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

STIP Pg. #: 30

TIP Pg. #:

Jackson Co is attainment for all monitored air pollutants. 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. No historic resources have been identified. McKee Quad, 1976, -83.991669 37.430539 Decimal Degrees.

#### C. Threatened and Endangered Species

The USGS Quadrangle is McKee. Current species listed for Jackson County are Indiana bat, gray bat, Cumberland darter, blackside dace, Cumberland arrow darter and Kentucky arrow darter. Project is located in a P1 P2 IB polygon. 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. Other possible hazardous materials to investigate will be asbestos in structures.

#### 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 McKee. Pigeon Roost Creek is not listed as a special use water. No wetlands are identified near the project. A water of the United States, Pigeon Roost Creek, 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

Bridge replacement.

#### G. Socioeconomic

Check all that may apply: ☐ Low Income/Minority Populations affected ☐ Relocations ☐ Local Land Use Plan available  
Do not expect relocations.

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

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

None expected.

Anticipated Environmental Document:

CE Level 1





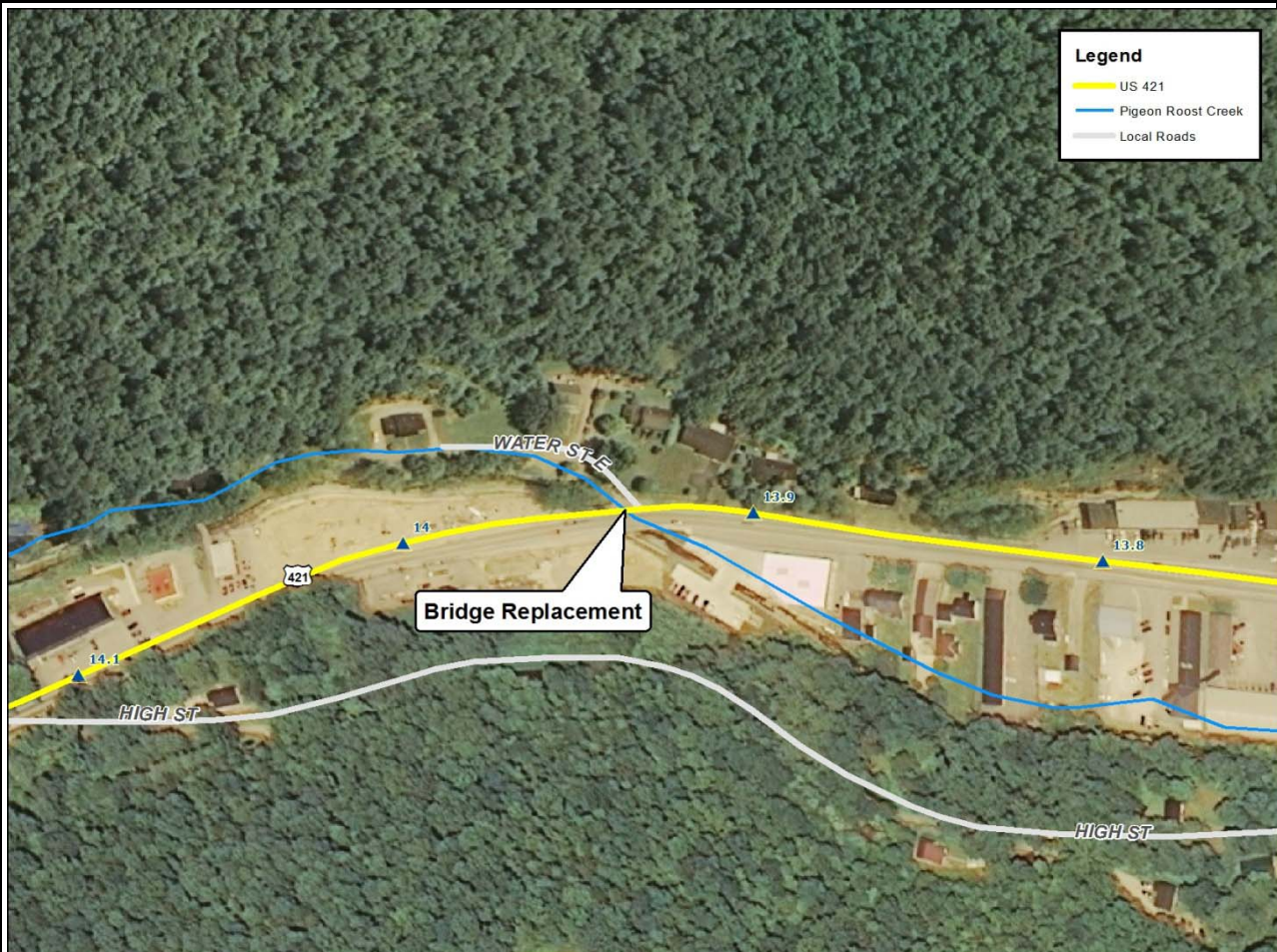
#### IV. POSSIBLE ALTERNATIVES

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

This alternate could be carried forward, but does not address the need to replace a the bridge that is structurally deficient. If the bridge was closed, the residents would have to use an approximate 14 mile detour.

##### B. Alternative 2: Build In-Place With Diversion

Due to the roadway alignment approaching this bridge, only one alternate will be considered. This entire section of roadway has residential and commercial development. The bridge is to be replaced in its existing location. However, retaining walls are built adjacent to the bridge on the south side of US 421. Extreme caution should be used not to disturb the existing retaining walls. Since a detour around the bridge would require an approximate 14 mile drive, a diversion will be necessary. The diversion will be parallel to the north of the existing bridge.



Planning Level Cost Estimate:

<u>Phase</u>	<u>Estimate</u>
Design	\$300,000
R/W	\$35,000
Utilities	\$50,000
Const	\$575,000
<b>Total</b>	<b>\$960,000</b>

### V. Summary

This study is a Data Needs Analysis (DNA) of a bridge replacement over Pigeon Roost Creek at the intersection with Water Street on US 421. Through analysis of the existing roadway geometrics, site visits, and discussion with the project team, several key points were identified within the project limits. The following were identified as key points:

- ® The bridge needs replaced.
- ® There are no apparent deficiencies in the roadway tying into the bridge.
- ® The detour is an unacceptable length.

In conclusion, the project team recommends replacing the existing bridge in the same location, while using a diversion parallel to the north of the existing bridge.

Alt #	Description	D (\$) <a href="#">(BRO)</a>	R (\$) <a href="#">(BRO)</a>	U (\$) <a href="#">(BRO)</a>	C (\$) <a href="#">(BRO)</a>	Total
1	No Build	-	-	-	-	-
2	Build In-Place With Diversion	300,000	35,000	50,000	575,000	960,000
-	Current Hwy Plan Estimated Cost	300,000	100,000	50,000	555,000	1,005,000
-	Current Pre-Con Estimated Cost	300,000	35,000	50,000	575,000	960,000

### VI. Tables and Exhibits

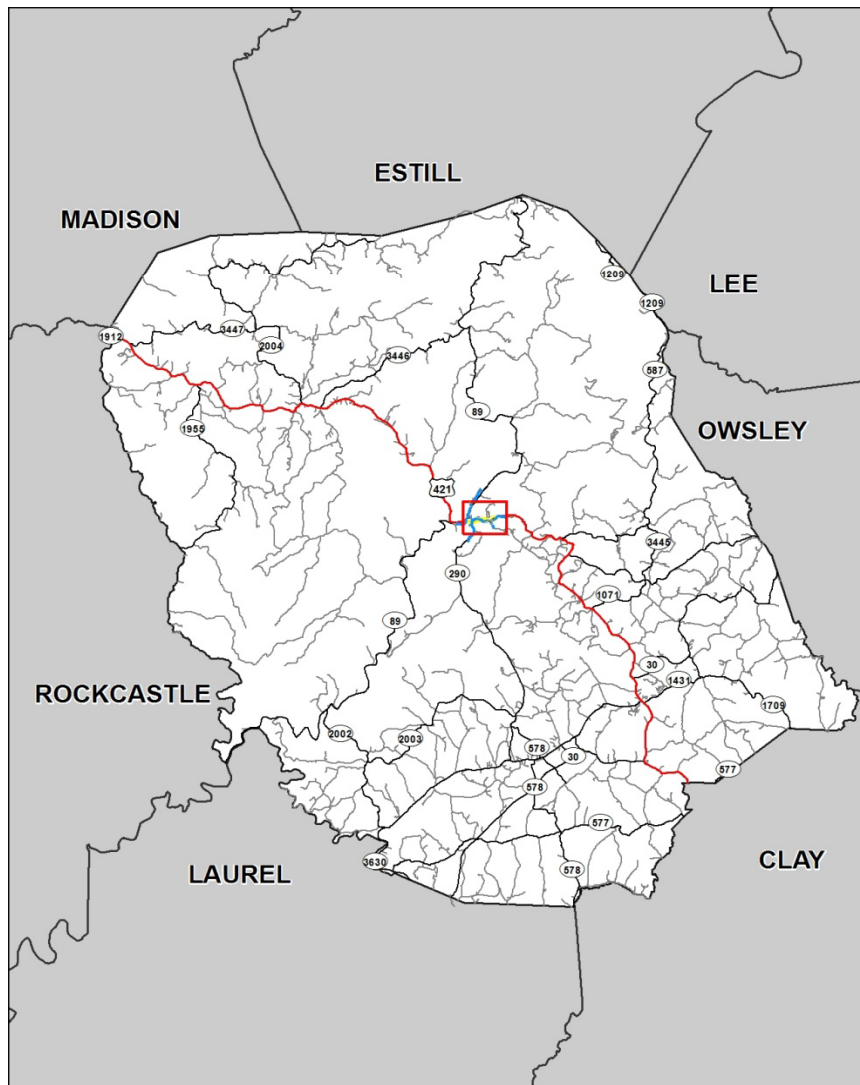


Exhibit 1: Project Location Map



VI. Tables and Exhibits (cont.)

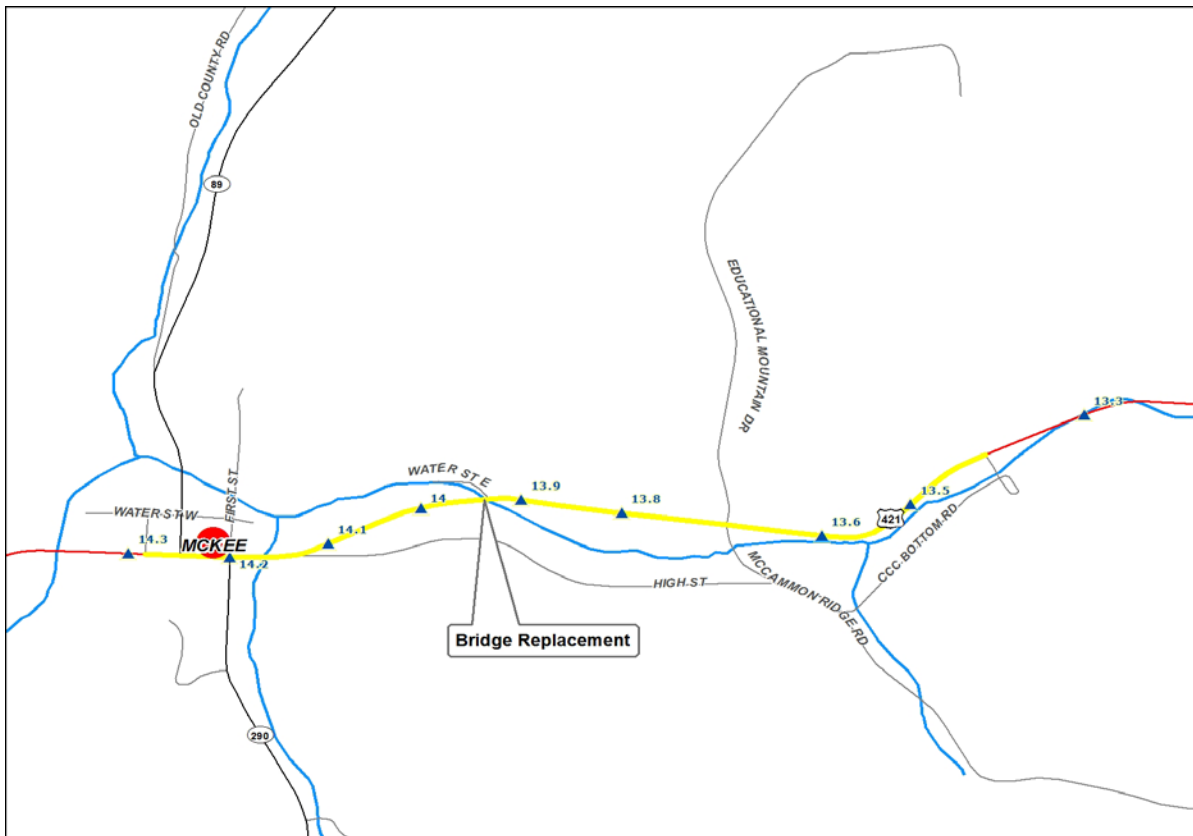


Exhibit 2: Detailed Location Map

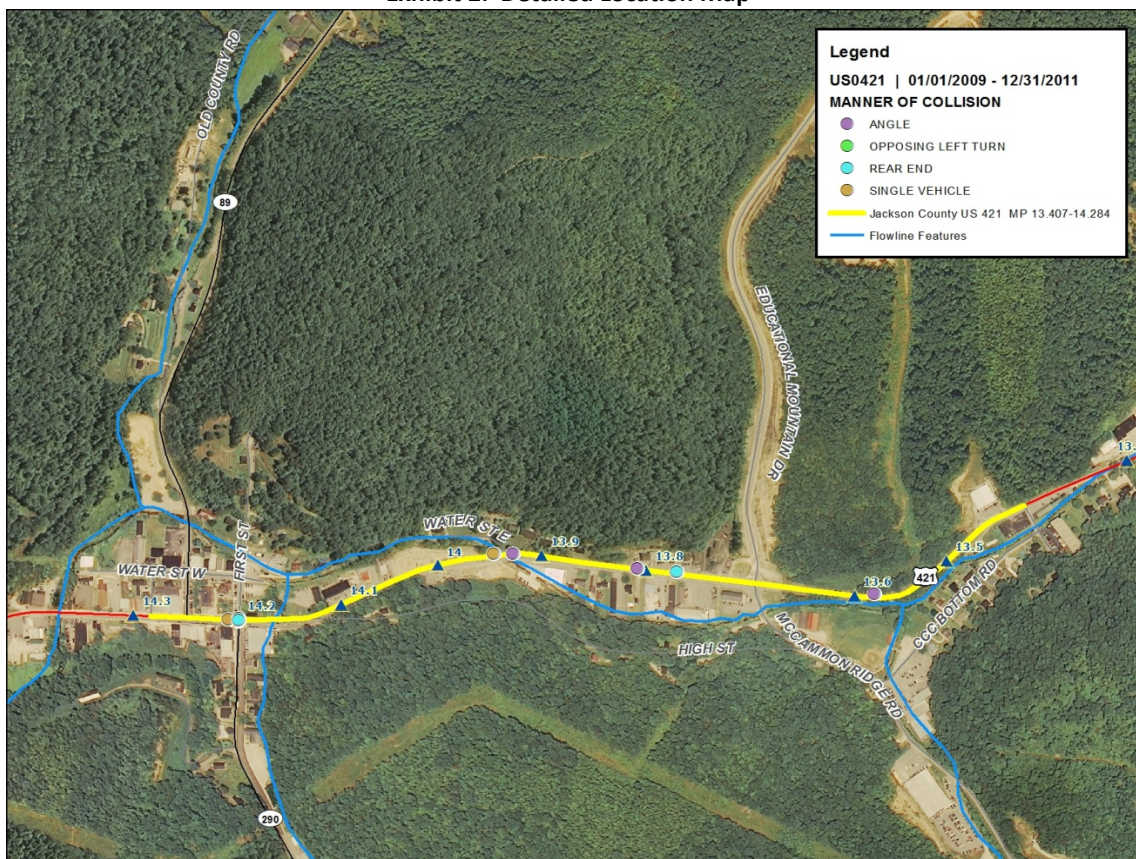


Exhibit 3: Collision Map



**VI. Tables and Exhibits (cont.)**



**Exhibit 4: Looking West on US 421 Bridge over Pigeon Roost Creek toward McKee**



**Exhibit 5: Looking North at US 421 Bridge over Pigeon Roost Creek**