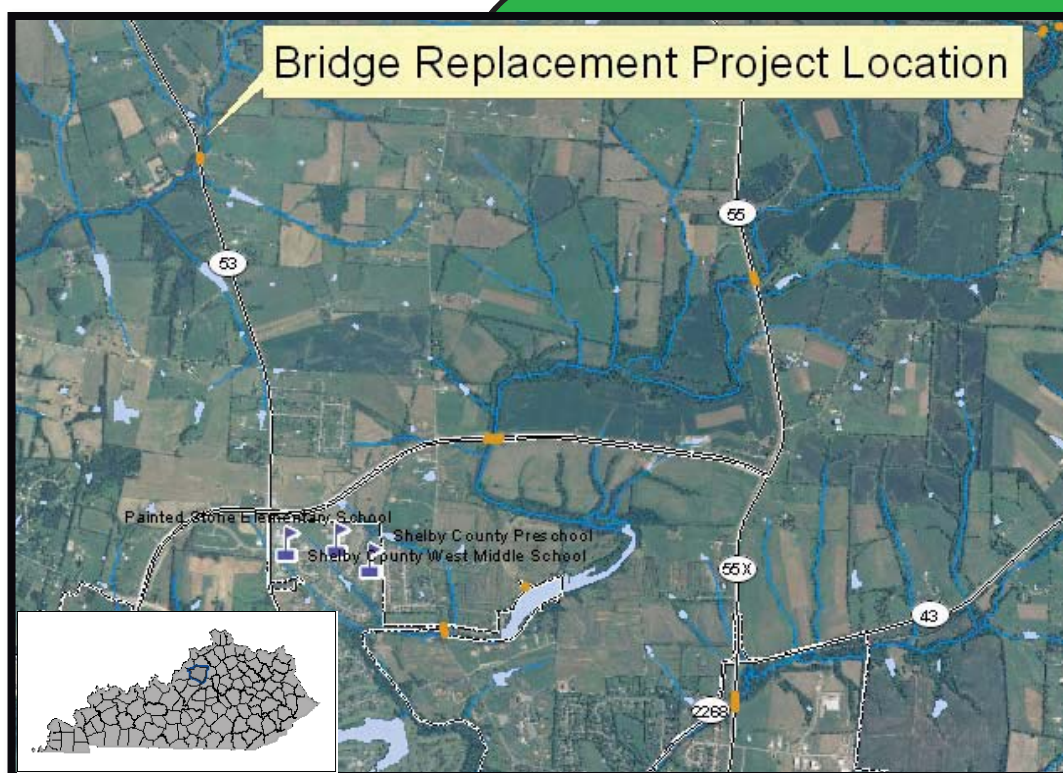


Data Needs Analysis



Scoping Study



Bridge Replacement on
KY 53 Over Fox Run Creek
Shelby County
MP 11.316 to MP 11.416
Item No. 5-1060.00

Prepared by the KYTC
Division of Planning and
KYTC District 5

September 2011



I. PRELIMINARY PROJECT INFORMATION

County: Shelby Item No.: 5-1060.00
Route Number(s): KY 53 Road Name: LaGrange Rd
Program No.: 86572 01D UPN: (FD52) 106 53 11.3-11.41
Federal Project No.: BRO 5158 (013) Type of Work: Bridge Replacement

2012 Highway Plan Project Description:

Replace Bridge on KY-53 (MP 11.366) over Fox Run Creek; 3.0 MI North of JCT US-60W; ID 106B00031N

Beginning MP: 11.316 Ending MP: 11.416 Project Length: 0.10 MI

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: 11.8

ADT (current): 4070 2011 Terrain: Rolling
Access Control: ☐ None ☒ Permit ☐ Fully Controlled ☐ Partial Spacing: ☐

Median Type: ☒ Undivided ☐ Divided (Type):
Existing Bike Accommodations: None Ped: ☐ Sidewalk

Posted Speed: ☐ 35 mph ☐ 45 mph ☒ 55 mph ☐ Other (Specify):

KYTC Guidelines Preliminarily Based on : 55 MPH Proposed Design Speed

COMMON GEOMETRIC

Roadway Data:	EXISTING	PRACTICES*	
No. of Lanes	<u>2</u>	<u>Min. 2</u>	Existing Rdwy. Plans available? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Year of Plans: <u></u>
Lane Width	<u>9</u>	<u>12'</u>	
Shoulder Width	<u>0</u>	<u>8'</u>	<input checked="" type="checkbox"/> Traffic Forecast Requested Date Requested: <u>6/29/2012</u>
Max. Superelevation**	<u>N/A</u>	<u>8%</u>	
Minimum Radius**	<u>N/A</u>	<u>965'</u>	<input checked="" type="checkbox"/> Mapping/Survey Requested Date Requested: <u>9/20/2012</u>
Maximum Grade	<u>2%</u>	<u>5%</u>	
Minimum Sight Dist.	<u></u>	<u>495'</u>	Type: <u>Conventional</u>
Sidewalk Width(urban)	<u>N/A</u>	<u>0</u>	
Clear-zone***	<u></u>	<u></u>	

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.*: 106B00031N (Bridge #2)
Sufficiency Rating: 40.1 [Existing Geotech data available?](#)
Total Length: 129' ☐ Yes ☒ No
Width, curb to curb: 19'
Span Lengths: 40'
Year Built: 1927
Posted Weight Limit: T1/20T T2/27T T3/34T T4/40T
Structurally Deficient?: Yes
Functionally Obsolete?: No

*If more than two bridges are located on the project, include additions sheets.

II. PROJECT PURPOSE AND NEED

A. Legislation

This project was approved by the General Assembly as part of the Bridge Replacement Program in the 2012 Highway Plan.

<i>Funding</i>	<i>Phase</i>	<i>Year</i>	<i>Amount</i>
BRO	D	2012	\$110,000
BRO	R	2014	\$100,000
BRO	U	2014	\$70,000
BRO	C	2016	\$570,000

B. Project Status

Initial design funds of \$237,500 were authorized by TC-10 No. 86572-0 on 5/28/2012. See Alternative 2 for a map of the corridor showing the preferred alternative. The reconstruction of KY 53 from MP8.750 to MP19.609 is currently on the Unscheduled Needs List. The project is to be combined with two other bridge replacement projects in Shelby County (5-1063.00, 5-1069.00) to be advertised under one design consultant. The project is ready for advertisement.

C. System Linkage

KY 53 is a Rural Minor Arterial with ADT's: Current (2011): 4,070, Future (2036): 6,600. This Rural Minor Arterial connects LaGrange in Oldham County with Shelbyville in Shelby County.

D. Modal Interrelationships

NA

E. Social Demands & Economic Development

KY 53 connects the outer lying rural areas of Shelbyville to the city and its institutions including, but not limited to: hospitals, schools, churches, and businesses. Kentucky State Data Center suggests population for Shelby County to grow 1.87% annually over the next 20 years.

F. Transportation Demand

The ADT in 2012 was 4,200 and the projected ADT in 2036 is 6,600 according the Traffic Forecast dated July 31, 2012. Exponential growth analyses performed on historical data at traffic station 106777 (MP 11.2), suggests traffic volumes have been growing at a rate of 1.9% annually.

II. PROJECT PURPOSE AND NEED (cont.)

G. Capacity

There are currently no capacity issues with the bridge and none are anticipated.

H. Safety

The collision data from the KY State Police Analysis Database from 9/9/2009 to 9/9/2012 indicates that there were three collisions with property damage and one collision with injury in the project area.

I. Roadway Deficiencies

The bridge is a narrow two lane rated structurally deficient .

Draft Purpose and Need Statement:

Need: The project is necessary to replace the two-lane bridge, which is dilapidated and structurally deficient, to improve safety and substandard condition of the bridge. With severe spalling, deterioration, exposed reinforcement steel and section loss, the two-lane bridge has been assessed a sufficiency rating of 40.1.

Purpose: The purpose of this project is to replace the bridge (106B00031N - 85 year old, 3- span T-Beam Bridge, 129' in length) and its approaches on KY 53 between MP 11.316 and MP 11.416 over Fox Run Creek.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

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

STIP Pg. #: FY 2011-2014 p. 93

TIP Pg. #: N/A

B. Archeology/Historic Resources

☒ Known Archeological or Historic Resources are present

Bridge is concrete and greater than 50 years old (1927) but DEA architectural historian advises that the structure is not eligible for the NRHP. A site specific review by a qualified archaeologist and architectural historian will be required to complete the Section 106 review for the project.

C. Threatened and Endangered Species

Endangered species habitat exists in the project area. Most specifically, Indiana bat and gray bat habitat. Fox Run Creek is probably too small to provide habitat for endangered mussel species and a site specific biological review will be necessary to determine habitat for all endangered and threatened species.

D. Hazardous Materials

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

A NOI will be required to be submitted to the Division of Air Quality for the demolition of the deficient bridge. Typically, the contractor is required to submit this NOI to the regional office at least 10 working days before demolition. It is a concrete structure with guardrail so no ACM (Asbestos Containing Material) expected to be present. No UST's anticipated.

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

Project lies within a FEMA zone A with no base flood elevations known. Impacts to the stream are expected to be within ACE LON limits with no mitigation expected. Site specific survey will be required to determine.

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

Typically, bridge replacement projects are not type I projects so no noise survey will be required.

G. Socioeconomic

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

No impacts anticipated with this bridge replacement.

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

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

Unless the bridge is found eligible for the NRHP or there is an adjacent property identified during the architectural review to be eligible, NO Section 4(f) or 6(f) resources are anticipated for this project.

Anticipated Environmental Document:

CE Level 1



IV. POSSIBLE ALTERNATIVES

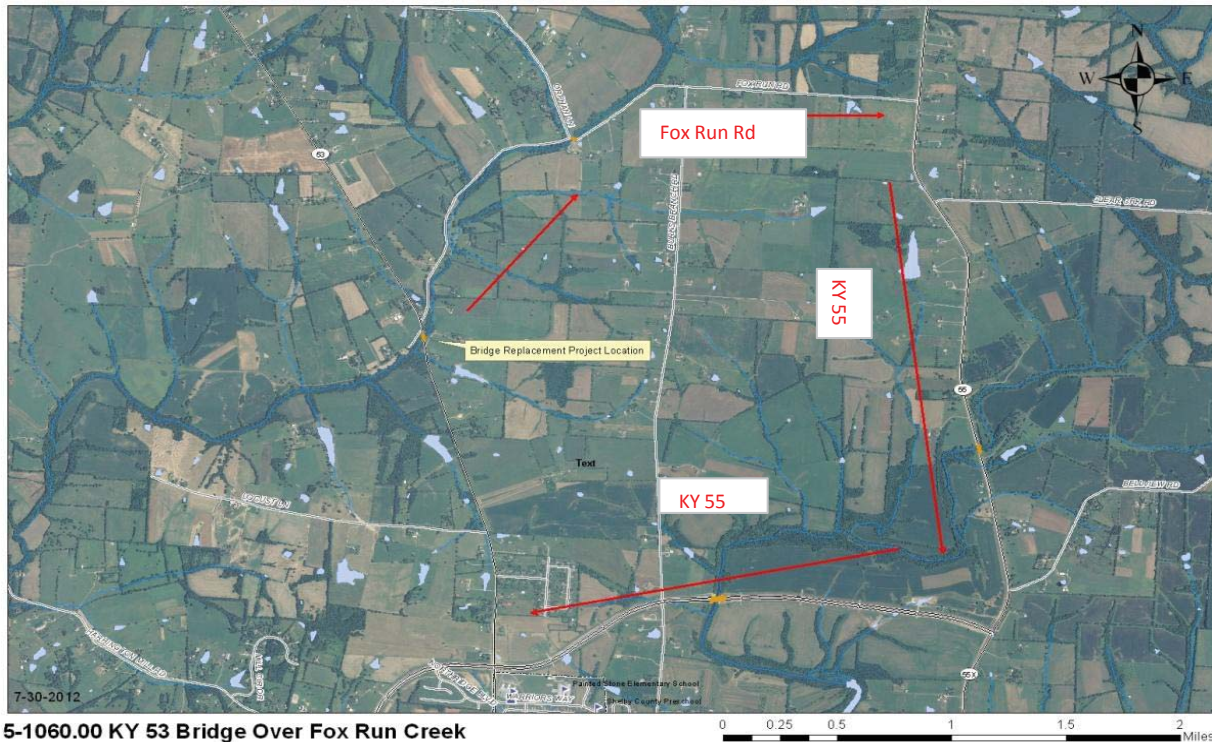
A. Alternative 1: No Build

This alternative should be carried forward, but does not meet the purpose and need of the project.

B. Alternative 2

Alternative 2 proposes to replace the bridge in its existing location. The detour route: KY 53 LaGrange Rd to KY 55 Freedom Way to KY 55 Eminence Pike then to Fox Run Rd and back to KY 53 LaGrange Rd as shown below is approximately 6.3 Miles. This alternative would require a minimum amount of Right of Way and minimize the impacts to utilities.

Alternate 2 - Replace Bridge in Existing Location & Detour Route



5-1060.00 KY 53 Bridge Over Fox Run Creek

Planning Level Cost Estimate:

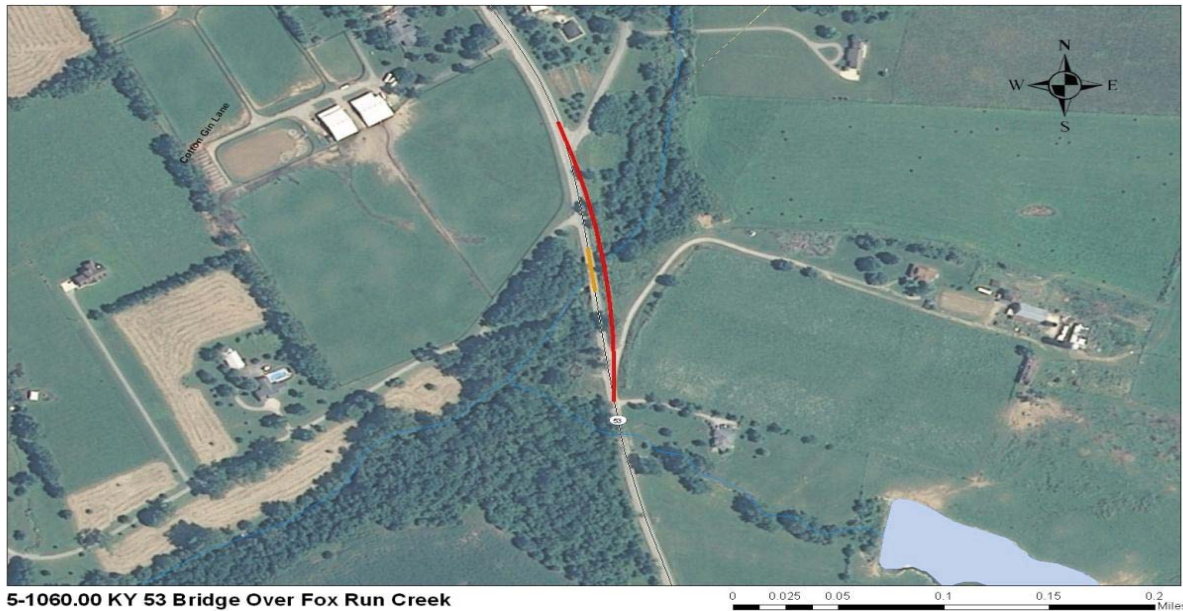
<u>Phase</u>	<u>Estimate</u>
Design	\$573,250
R/W	\$25,000
Utilities	\$30,000
Const	\$1,001,845
Total	\$1,630,095

IV. POSSIBLE ALTERNATIVES (cont.)

B. Alternative #3

Alternative 3 proposes to build a new bridge structure to the east of the existing bridge. The Alternative Map below shows that the diversion should be built to the east of the existing bridge as an 8" water main runs along the west side of the existing bridge and would be more costly to relocate. On the east side of the bridge there are existing utility poles on the that may be in conflict with the project limits. However, it may be possible to work around these during construction. A new alignment would require more roadway construction, Right of Way, and possibly have greater utility impacts, than Alternative 2, and is the most costly of the Alternatives.

Alternate 3 - Build Using Proposed New Alignment



Planning Level Cost Estimate:

<u>Phase</u>	<u>Estimate</u>
Design	\$573,250
R/W	\$50,000
Utilities	\$30,000
Const	\$1,381,751
Total	\$2,035,001

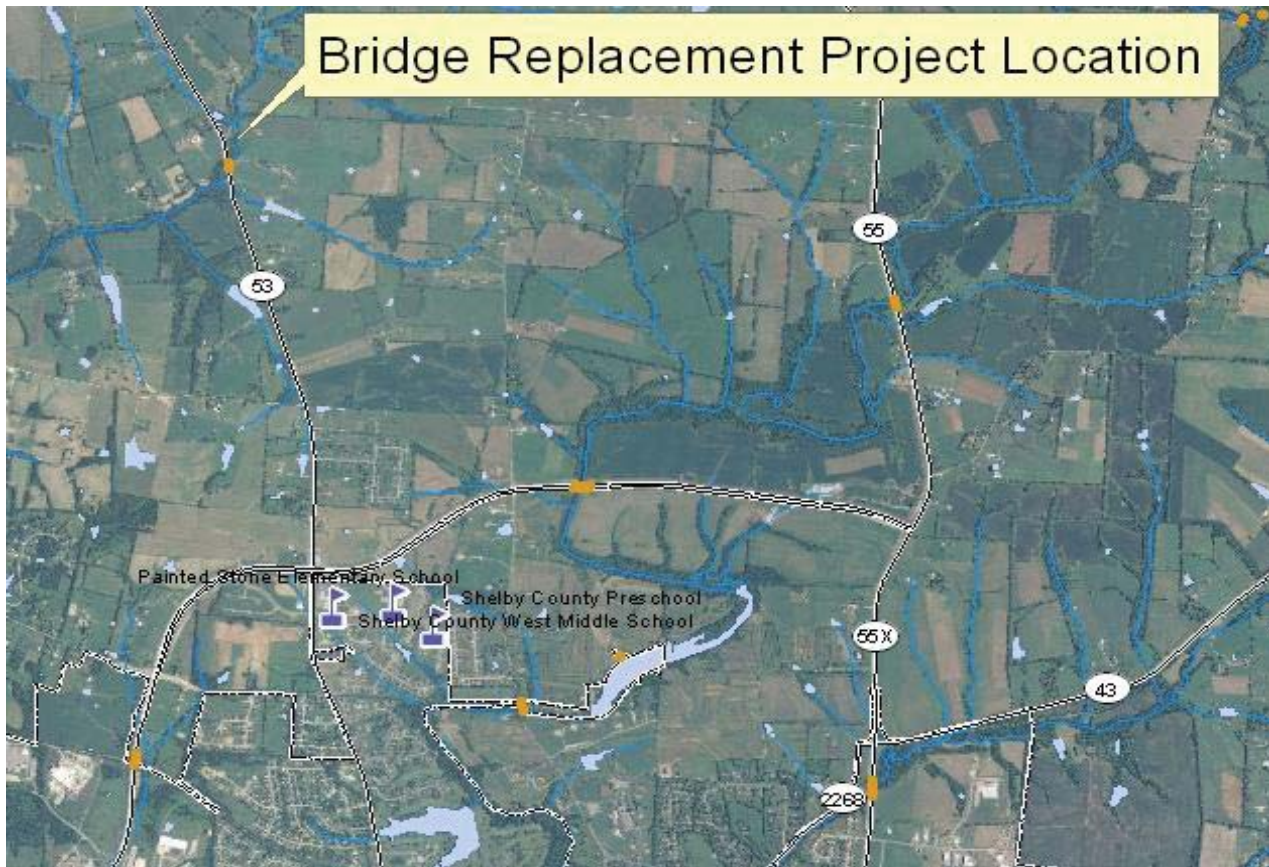
V. Summary

This is a DNA Study of Item #5-1060.00 Replace Bridge over Fox Run Creek as authorized in the 2012 Biennial Highway Plan. The reconstruction of KY 53 from MP 8.750 to MP19.609 is currently on the Unscheduled Needs List but does not propose any additional lanes. The new bridge structure should be wide enough to accommodate the potential width of a reconstructed KY 53. Construction of the bridge should be done as much as possible over the summer months. The project team recommends that Alternative 1 and Alternative 2 be carried forward into the Design Phase.

Alt #	Description	D (\$)(Fund)	R (\$)(Fund)	U (\$)(Fund)	C (\$)(Fund)	Total (\$mil)
1	No Build	-	-	-	-	-
2	Replace Bridge in Existing Location	\$573,250	\$25,000	\$30,000	\$1,001,845	\$1,630,095
3	New Alignment	\$573,250	\$50,000	\$30,000	\$1,381,751	\$2,035,001
-	Current Hwy Plan Estimated Cost	\$110,000	\$100,000	\$70,000	\$570,000	\$850,000
-	Current Pre-Con Estimated Cost					

VI. Tables and Exhibits

Exhibit 1: Project Location Map



Data Needs Analysis
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Replace Bridge on KY-53
Over Fox Run Creek
VI. Tables and Exhibits (cont.)

Exhibit 2: Collision Data



KY State Police Analysis Database Collision Data 9/9/2009 to 9/9/20012

VI. Tables and Exhibits (cont.)

Exhibit 3: Bridge Inspection Report

106B00031N Inspection 9-9-2011



Deck has multiple patches/cracks/delaminated



Deck cracks w/delamination



Deck cracks w/delamination



Deck cracks w/delamination

1

Data Needs Analysis
Scoping Study
Replace Bridge on KY-53
Over Fox Run Creek
VI. Tables and Exhibits (cont.)

106B00031N Inspection 9-9-2011



Cracked and delaminated areas breeking up at joint



Deck has lots of cracks w/delamination



Deck spalling and breaking up along joint



Cracked and delaminated areas breaking up along joint

2

Helpful Links:

ProjectWise Link to Design Working Folders:

<pw:\\KYTCP00W02.kytc.ds.ky.gov:KYTC-Main\\Documents\\Projects\\District 05\\05-1060.00 – SHELBY – KY53 – Replace Bridge Over Fox Run Creek\\Working Folders\\Highway Design Working Folder\\Project Background Data and Requests\\>

KYTC Bridge Data Miner Link:

Bridge No. 106B00031N

<http://kytcspwf03/PONTIS/default.aspx>