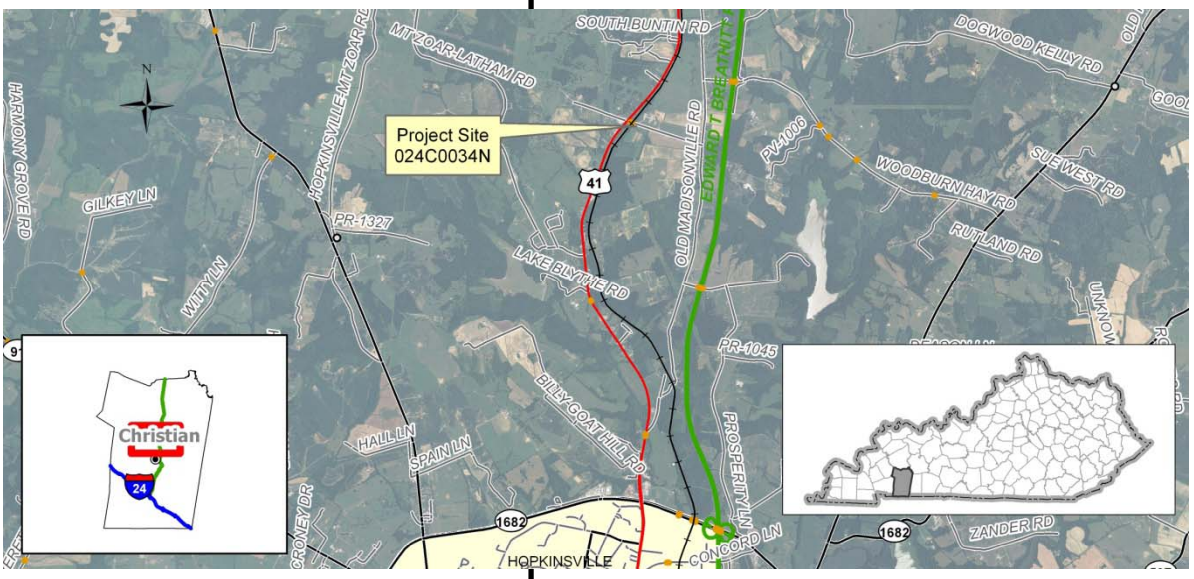
Data Needs Analysis



Scoping Study

Sub Station Road (CR 1116)
Christian County
Replace Bridge over CSX RR

Item No. 2-1085.00

Prepared by KYTC

April 2013

KENTUCKY TRANSPORTATION CABINET

I. PRELIMINARY PROJECT INFORMATION

County: Christian **Item No.:** 02-1085.00
Route Number(s): CR 1116 **Road Name:** Sub Station Road
Program No.: 8757501D **UPN:** FD52 024 1116 000-001
Federal Project No.: BRZ 0203 (311) **Type of Work:** Bridge Replacement

2012 **Highway Plan Project Description:**

REPLACE BRIDGE ON SUB STATION RD (CR 1116) OVER CSX RR 0.04 MILE E OF US 41 (SR 34.4)
024C00034N

BMP: 0.019 **EMP:** 0.059 **Project Length:** 0.04 MI.

Functional Class.: ☐ Urban ☑ Rural Local **State Class.:** ☐ Primary ☐ Secondary
Route is on: ☐ NHS ☐ NN ☐ Ext Wt
MPO Area: Not Applicable **Truck Class.:**
In TIP: ☐ Yes ☐ No **% Trucks:** Unknown
ADT (current): 102 (2006) **Terrain:** Rolling
Access Control: ☐ None ☐ Permit ☐ Fully Controlled ☐ Partial Spacing:
Median Type: ☑ Undivided ☐ Divided (Type):
Existing Bike Accommodations: Shared Lane **Ped:** ☐ Sidewalk
Posted Speed: ☐ 35 mph ☐ 45 mph ☐ 55 mph ☐ Other (Specify):
KYTC Guidelines Preliminarily Based on : 15 **MPH Proposed Design Speed**

Roadway Data:	**EXISTING**	**COMMON GEOMETRIC PRACTICES***
No. of Lanes	1	AASHTO's "Geometric
Lane Width	14 ft	Design Guidelines for very
Shoulder Width	Unknown	low-volume local roads
Max. Superelevation**	Unknown	(ADT ≤ 400)" states a
Minimum Radius**	Unknown	replacement bridge can be
Maximum Grade	Unknown	constructed with the same
Minimum Sight Dist.	Unknown	width as the existing bridge
Sidewalk Width(urban)	N/A	with no site-specific
Clear-zone***		safety problem

Existing Rdwy. Plans available? ☐ Yes ☑ No
Year of Plans:
☐ Traffic Forecast Requested
Date Requested:
☐ Mapping/Survey 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.*:	024C00034N
Sufficiency Rating	34.4
Total Length	80.1 ft
Width, curb to curb	12.1 ft
Span Lengths	3 spans, Max span 30.8 ft
Year Built	1935
Posted Weight Limit	Posted, 14 tons
Structurally Deficient?	Yes
Functionally Obsolete?	No
Existing Bridge Type	Steel Girder, Wood Deck

Existing Geotech data available? ☐ Yes ☑ No

Bypass Detour Length(s): 3.7 mi

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

II. PROJECT PURPOSE AND NEED

A. Legislation

This project is in the approved 2012 Highway Plan.

Funding	*Phase*	*Year*	*Amount*
BRZ	D	2013	$175,000
BRZ	R	2015	$150,000
BRZ	U	2015	$120,000
BRZ	C	2017	$500,000

B. Project Status

Design funds for this project were authorized in February 2013. There are no other projects near the project site in the current Highway Plan or on the Unscheduled Needs List (UNL).

C. System Linkage

This county road provides access to a power sub station and a connection from US 41 to Old Madisonville Road.

D. Modal Interrelationships

The bridge spans over the CSX RR double tracks.

E. Social Demands & Economic Development

N/A.

F. Transportation Demand

The only traffic data for this road was reported on the Bridge Long Form as 102 in 2006. However, during a site visit a considerable amount of traffic was observed. A new count would be beneficial as it appears traffic has increased along the route.

II. PROJECT PURPOSE AND NEED (cont.)

G. Capacity

There currently are no capacity problems on this route and none are expected in the future.

H. Safety

According to the KY State Police database, no collisions were reported on or near the bridge in the last three years. The bridge is structurally deficient which could impact the safety of motorists is not addressed.

I. Roadway Deficiencies

In order to get the clearance needed over the RR, the one-lane bridge arches over the RR with the crest of the vertical curve near the midpoint of the bridge. Sight distance is limited for the two-way traffic on the one-lane bridge. Additionally the bridge is classified as structurally deficient.

Draft Purpose and Need Statement:

Need: The bridge over the CSX RR is structurally deficient. There is poor sight distance for two-way traffic due to the vertical curve that crests near the middle of the one-lane bridge.

Purpose: The purpose of this project is to address the structural deficiencies and limited sight distance in order to provide a safe connection between US 41 and the power sub station and Old Madisonville Road.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

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

STIP Pg.#: None **TIP Pg.#:**

Attainment is for 8-hour Ozone (2008 NAQS)

B. Archeology/Historic Resources

☐ Known Archeological or Historic Resources are present

Archaeological issues possible in surrounding fields. Dependent upon disturbance of areas around approach and bridge. No know Historic Resources at this stage of project

C. Threatened and Endangered Species

No Effect unless large trees on South are removed. Will have to pay mitigation fees contingent upon time of year they are removed (Indiana Bat requirements). DEA Biologist examined site

D. Hazardous Materials

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

Structure is treated wood with metal trusses, supports. No know asbestos at this time.

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

USACE Letter of Notification may be needed. DEA Permits Expert needs to examine final plans

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

One house is adjacent and will be affected by construction noise. New bridge will not increase noise. Analysis is not expected at this time

G. Socioeconomic

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

Bridge replacement that increases safety is desired in the Christian Co / Hopkinsville Land Use Plan

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

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

Resources do not appear to be present at this stage of project

Anticipated Environmental Document: CE Level 1

IV. PROJECT SCOPING

A. Alternative 1: No Build

The bridge will continue to deteriorate and eventually need replacement.

B. Alternative 2: Replace Bridge

Construct new 60' single span bridge to replace existing bridge on same alignment.

	Current Estimate
Phase	Estimate
Planning	
Design	$350,000
R/W	$75,000
Utilites	$200,000
Const	$321,000
Total	**$946,000**

The cost estimate is based on replacing the existing 3-span, single lane structure (total length = 80') to a single span bridge with a total length of 60' in the same location with no alignment shift. The proposed bridge includes 2 - 12' lanes (24 feet curb to curb). The proposed approach length on the east side extends to the entrance of the substation. The current approach width needs to be widened to accommodate the widening of the bridge. There may be differential elevation for embankment due to the vertical alignment (steep grade) and clearance needed for CSX railroad. Temporary easements for construction would most likely need to be acquired around the bridge for removal of the existing structure and other construction activities as well as allowing room for materials. Overhead utilities will have to be relocated. RR approval will be required for this project.

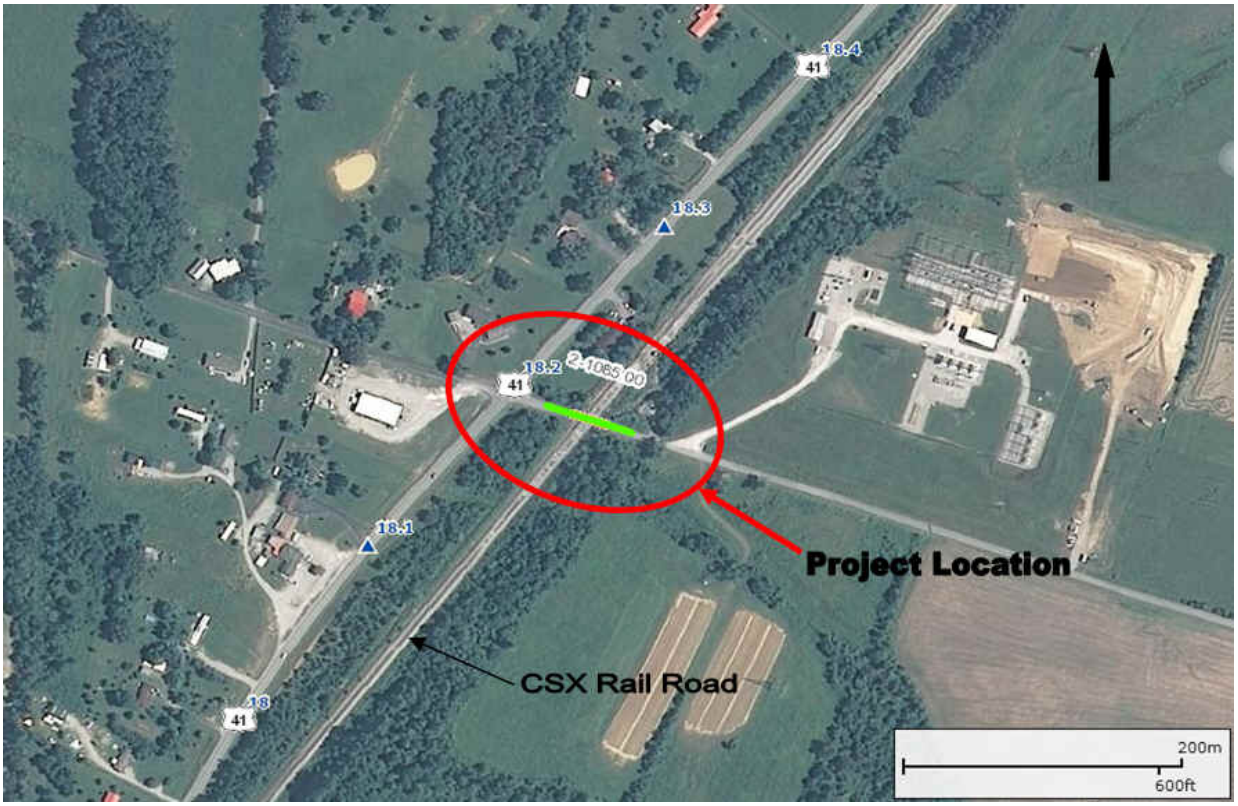
C. Alternative 3: Replace Bridge

Construct new 3 span bridge (Total Length = 80') to replace existing bridge on same alignment.

	Current Estimate
Phase	Estimate
Planning	
Design	$350,000
R/W	$75,000
Utilites	$200,000
Const	$448,000
Total	**$1,073,000**

The cost estimate is based on replacing the existing 3-span, single lane structure (total length = 80') to a 3-span bridge with the same total length of 80' in the same location with no alignment shift. New constructed piers are considered. The proposed bridge includes a widening of 2 - 12' lanes (24 feet curb to curb). The proposed approach length on the east side extends to the entrance of the substation. The current approach width needs to be widened to accommodate the widening of the bridge. There may be differential elevation for embankment due to the vertical alignment (steep grade) and clearance needed for CSX railroad. Temporary easements for construction would most likely need to be acquired around the bridge for removal of the existing structure and other construction activities as well as allowing room for materials. Overhead utilities will have to be relocated. RR approval will be required for this project.

IV. PROJECT SCOPING (cont.)

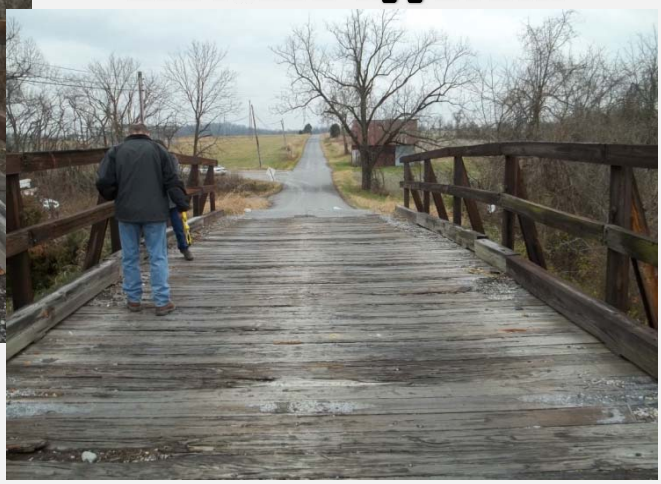


V. Summary

Taking into consideration the utility and right of way impacts and RR involvement, it may be more desirable to replace the bridge in place. The detour is approximately 4 miles. Consideration should be given to the sight distance issues created by the vertical crest that will be on the bridge and the clearance needed for the railroad. It is recommended to use Alternative 2 based on cost and having appropriate RR clearances while meeting the Purpose and Need.

Westward Approach

Eastward Approach



VI. Tables and Exhibits

VI. Tables and Exhibits (cont.)