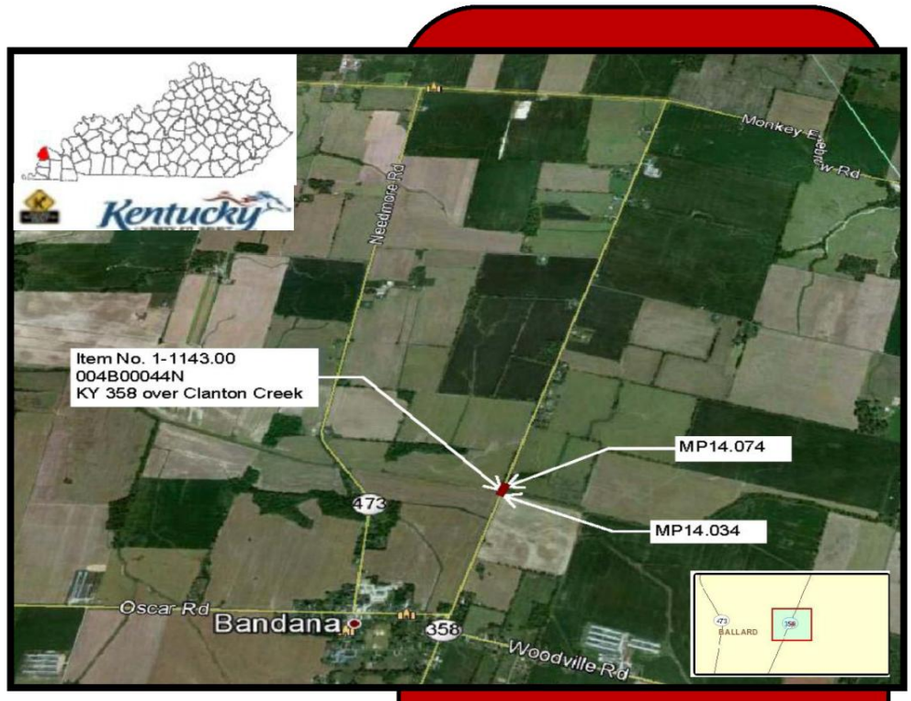
Data Needs Analysis



Scoping Study

KENTUCKY TRANSPORTATION CABINET

KY 358
Ballard County
Clanton Creek
Bridge Replacement
Item No. 1-1143.00

Prepared by
KYTC District 1

June 2012

I. PRELIMINARY PROJECT INFORMATION

County: Ballard **Item No.:** 1-1143.00
Route Number(s): KY 358 **Road Name:** Bandana Road
Program No.: 86740 **UPN:** 004 0358 014-015
Federal Project No.: BRO 0103 (306) **Type of Work:** Bridge Replacement
2013 **Highway Plan Project Description:**

Replace bridge on KY 358 over Clanton Creek approximately 0.5 miles North of KY 473 (SR 26.5)
004B00044N

Beginning MP: 14.034 **Ending MP:** 14.074 Project Length: 0.04

Functional Class.: ☐ Urban ☑ Rural — Collector
State Class.: ☐ Primary ☑ Secondary
Route is on: ☐ NHS ☐ NN ☑ Ext Wt
MPO Area: Not Applicable
Truck Class.: A
In TIP: ☐ Yes ☑ No
% Trucks: 9.3
ADT (current): 233 2010
Terrain: Rolling
Access Control: ☐ None ☑ Permit ☐ Fully Controlled ☐ Partial Spacing:
Median Type: ☑ Undivided ☐ Divided (Type):
Existing Bike Accommodations: Designated US Bike Rou
Ped: ☐ Sidewalk
Posted Speed: ☐ 35 mph ☐ 45 mph ☑ 55 mph ☐ Other (Specify):
KYTC Guidelines Preliminarily Based on : 50 **MPH Proposed Design Speed**

Roadway Data:	**EXISTING**	**COMMON GEOMETRIC**
No. of Lanes	2	2
Lane Width	9'	9'
Shoulder Width	2'	2' paved
Max. Superelevation**		6%
Minimum Radius**		835'
Maximum Grade		7%
Minimum Sight Dist.		425'
Sidewalk Width(urban)		n/a
Clear-zone***		30'

Existing Rdwy. Plans available? ☐ Yes ☑ No
Year of Plans:
☑ **Traffic Forecast Requested**
Date Requested: 5/16/2012
☐ Mapping/Survey Requested
Date Requested:
Type:

Project Notes/Design Exceptions?: Yes, DE for 50mph instead of 55mph to more closely match existing conditions.

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

Bridge No.*:	(Bridge #1)
Sufficiency Rating	26.5
Total Length	96.1'
Width, curb to curb	22.0'
Span Lengths	29.9'
Year Built	1957
Posted Weight Limit	10 ton
Structurally Deficient?	Yes
Functionally Obsolete?	No

Existing Geotech data available? ☐ Yes ☑ No

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

II. PROJECT PURPOSE AND NEED

A. Legislation

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

Funding	*Phase*	*Year*	*Amount*
BRO	D	2013	$280,000
BRO	R	2014	$150,000
BRO	U	2014	$250,000
BRO	C	2015	$600,000

B. Project Status

Design funds for this project have been requested. This project is to replace the bridge on KY 358 over Clayton Creek approximately 0.5 miles North of KY 473. (SR 26.5) 004B00044N. The project will span from milepoint 14.034 to milepoint 14.074.

C. System Linkage

KY 358 is classified as Rural Minor Collector. It serves the local community as Bandana Road.

D. Modal Interrelationships

KY 358 is rated Truck Class A and has 9.3% total trucks.

A section of KY 358 is included as part of a designated bike route in Kentucky. From MP 7.984 to MP 17.007, KY 358 is designated as part of the Ramblin' River Tour bike route.

E. Social Demands & Economic Development

The area along KY 358 is made up of farm land. There looks to be very little expectation of economic development in the immediate area.

F. Transportation Demand

The last actual traffic count on KY 358 from MP 13.53 to MP 17.00 was in 2010 and showed an ADT of 233 (This data can be found in CTS). According to the traffic count data shown in CTS, there has been a decline over 11 years.
Based upon the Traffic Forecast received 6-25-2012, the 2035 ADT is estimated to be 310. That is calculated using a growth rate of 1% per year.

II. PROJECT PURPOSE AND NEED (cont.)

G. Capacity

Based upon the current traffic count of 233 ADT for KY 358 at the bridge over Clanton Creek and the roadway geometrics of two 9' lanes with 2' earth shoulders, and being mindful of the decline in traffic over 11 years and the very slow growth prediction in the Traffic Forecast, capacity does not look to be an issue at this time.

H. Safety

The CRF for KY 358 is 0.413.
The collision data was obtained from the Kentucky State Police database for a ten year period from January 1, 2002 to June 12, 2012 and stretching along KY 358 from MP 13.0 and MP 15.0 for the project. There were only 2 collisions found using these criteria, and neither are within the limits of the project. Please see Exhibit 2 on Page 9 for more details on collision locations.

I. Roadway Deficiencies

The existing roadway on KY 358 consists of two 9' lanes with 2' of earth shoulder. These findings fit with the HIS assessment of two 9' lanes and 2' shoulder. Since this road is classified as a Rural Minor Collector, KYTC's Practical Solutions Geometrics for Rural Collectors recommends using two 9' lanes with 2' paved shoulders. (This design will require a design exception for use of a design speed of 50mph to more closely match existing conditions.)
None of the roadway appears to have any significant drainage problems. However, approximately 250' North of the bridge there is an approximately 14-15' elliptical equivalent pipe at approximately 45 degree skew that may cause issues with the construction of approaches via drainage, channel change, etc. Please see Exhibits 3 and 4 on Page 10 for more details.
The bridge on KY 358 was built in 1957. It is rated Structurally Deficient. It has a Sufficiency Rating of 26.5. The load limit is posted for 10 tons. Several notes have been made in the bridge report of the ongoing decay of the bridge. Please see Table 1 on Page 10 for details.

Draft Purpose and Need Statement:

Need: The bridge over Clanton Creek needs to be improved due to being Structurally Deficient, having a Sufficiency Rating of 26.5, and poor roadway geometric.

Purpose: The purpose of this study is to identify all necessary concerns involved with the replacement of the bridge over Clanton Creek on KY 358 and to improve the reliability of this bridge via replacement.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

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

STIP Pg.#: **TIP Pg.#:**

B. Archeology/Historic Resources

☐ Known Archeological or Historic Resources are present

Project will require a phase I archaeological and cultural historic survey.

C. Threatened and Endangered Species

Myotis sodalis-Indiana bat(903)(IB); Plethobasus cooperianus-orangefoot pimpleback(414)(OFPM); Lampsilis abrupta-pink mucket(409)(PMM); Obvaria retusa-ring pink(412)(RPM); Plethobasus cyphyus- sheepnose(415)(SNM); Pleuroblema clava-clubshell(416)(CM); Pleuroblema plenum-rough pigtoe(417)(RPTM); Potamilius capax-fat pocketbook(418)(FPBM); Scaphirhynchus albus-pallid sturgeon(506)(PS); Sterna antillarum-interior least tern(802)(ILT)

D. Hazardous Materials

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

Structure will require asbestos testing. No others hazmat sites were found.

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

Depending on alternate used impacts could include wetlands.

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 impacts are expected to be temporary in nature and will only occur during construction.

G. Socioeconomic

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

No environmental justice issues are expected.

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

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

N/A

Anticipated Environmental Document: CE Level 1

IV. POSSIBLE ALTERNATIVES

A. Alternative 1: No Build

This alternative may be carried forward, but does not address this need identified.

B. Alternative 2: Replace in Existing Location

Replace the two lane rural roadway approaches on KY 358 and bridge over Clanton Creek in the same location as the existing. The new bridge may need to be widened to allow for the recommended geometrics. This alternate will not change the horizontal alignment. Since the existing bridge cannot remain open during construction, the road will be closed during construction. Traffic will be detoured onto other roads. A sketch of the proposed project can be seen below.

Planning Level Cost Estimate:

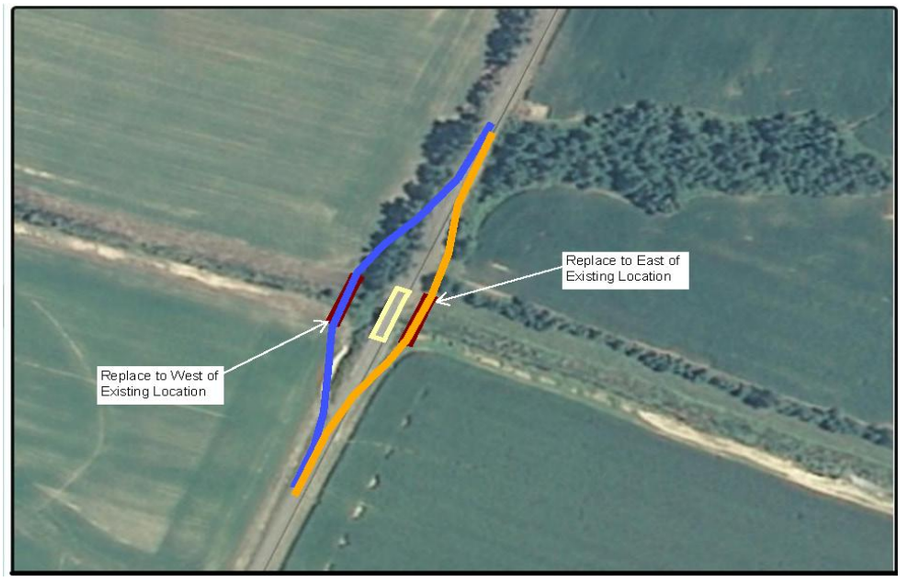
Phase	Estimate
Design	$275,000
R/W	$100,000
Utilities	$225,000
Const	$600,000
Total	**$1,200,000**

IV. POSSIBLE ALTERNATIVES (cont.)

B. Alternative 3: Replace to East / West of Existing Location

Replace the two lane rural roadway approaches on KY 358 and bridge over Clanton Creek just East or just West of its existing alignment. The new bridge may need to be widened to allow for the recommened geometrics. A sketch of the proposed project can be seen below.

Due to the extreme depth of the Creek at this location, the elliptical pipe North of the bridge, and taking into account the low ADT (233 ADT, 2010) for this road, the DNA Study Team finds this alternate to be "fiscally not feasible".



Planning Level Cost Estimate:

Phase	Estimate
Design	$275,000
R/W	$100,000
Utilities	$250,000
Const	$850,000
Total	**$1,475,000**

V. Summary

This study is a Data Need Analysis (DNA) of a Bridge Replacement project of the KY 358 (Bandana Road) bridge over Clanton Creek in Ballard County, Item Number 1-1143.00. Through analysis of the existing roadway geometrics, crash data, site visits, and discussion with the project team, several needs were identified within the project limits. The following were identified as project needs:

KY 358 has poor roadway geometrics.

KY 358 has a Sufficiency Rating of 26.5.

The purpose of this study is to address poor roadway geometrics and SR; and to improve the safety and reliability of the roadway and bridge on KY 358.

Included in the alternatives were a no build recommendation, a replace in the existing location alternative, and a replace to the East or West of the existing location alternative. After review of the data and discussion at the project team meeting, it was determined that Alternative #2, Replace in the existing location would best address the purpose and need for the project. The estimate for this alternative is within the funding listed in the current Highway Plan (phases D, R, U, and C).

Alt #	Description	D ($)BRO	R ($)BRO	U ($)BRO	C ($)BRO	Total ($mil)
1	No Build	-	-	-	-	-
2	Replace in Existing Location	275,000	100,000	225,000	600,000	1,200,000
3	Replace to East/West	275,000	100,000	250,000	850,000	1,475,000
-	Current Hwy Plan Estimated Cost	280,000	150,000	250,000	600,000	1,280,000
-	Current Pre-Con Estimated Cost	280,000	150,000	250,000	600,000	1,280,000

VI. Tables and Exhibits

Exhibit 1: Project Location Map

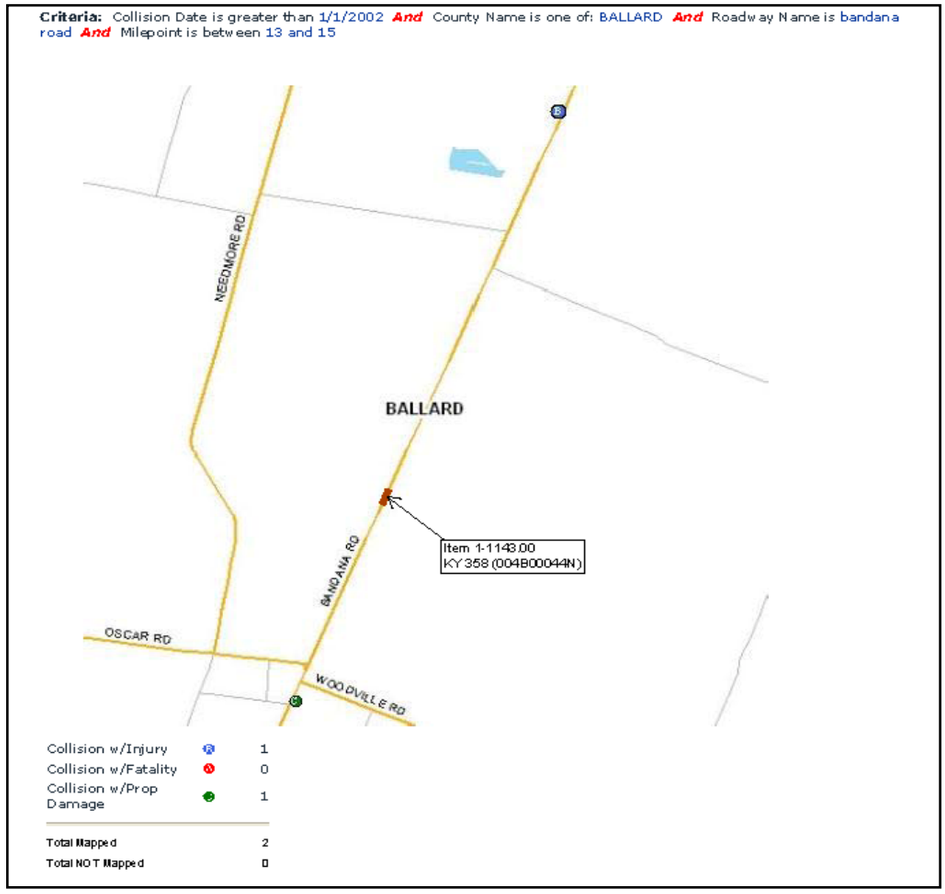


Exhibit 2: Collision Data from Kentucky State Police Database

VI. Tables and Exhibits (cont.)

Exhibit 3: Elliptical Equivalent Pipe

Exhibit 4: Elliptical Equivalent Pipe

Tables

Table 1: Specific Notes from 12/7/2011 Bridge Report
-Concrete Channel beams are heavily spalled with exposed steel with considerable amount of setion loss in each beam -Moderate to heavy decay in all timber piles. False bent in place at bent 2, due to pile failure. -Notable sag in deck on downstream side… -Recommend replacement; scour is a concern due to heavy stream degradation at bent #2.

Helpful Links:

Projectwise folder containing all DNA Study documents: Studies

Collision Reports: 1143 Collision Report - 1.pdf

1143 Collision Report - 2.pdf

Bridge Report: 1143 Bridge Report 12-7-2011.pdf

Bridge Pictures: 1143 Bridge Photos 12-7-2011.pdf

Traffic Forecast: 1143 Traffic Forecast 6-25-2012.pdf

(A printed version of these documents can be made available to those without Projectwise access.)