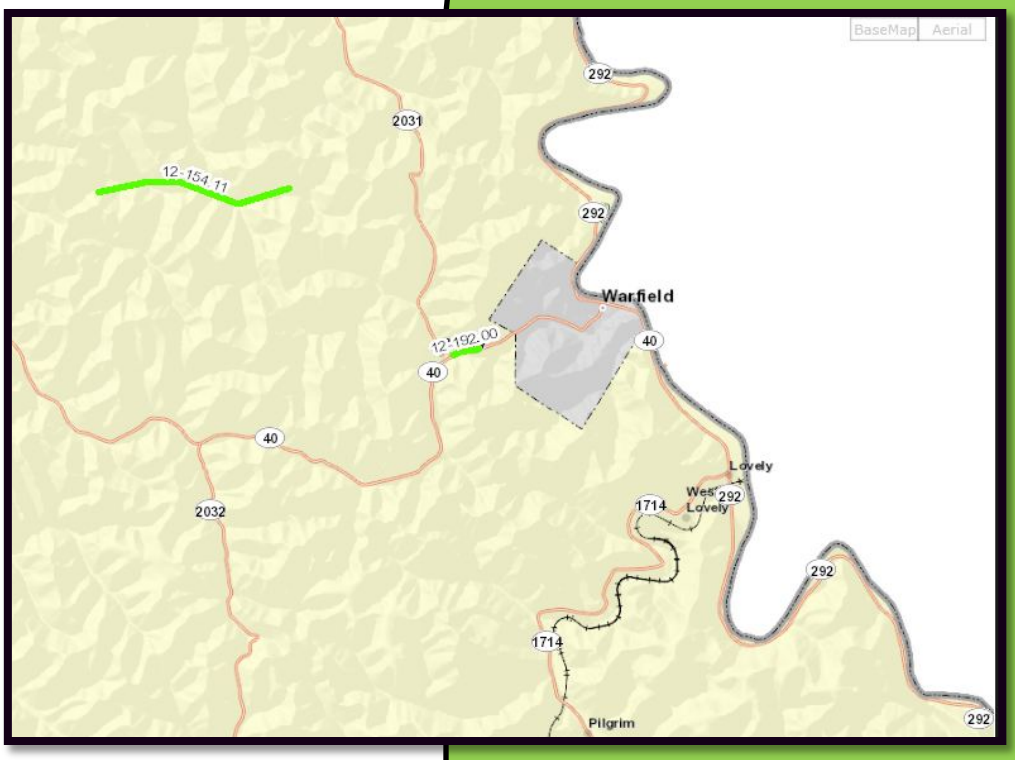
Data Needs Analysis



Scoping Study

Proposed Reconstruction
Martin County
Improve Alignment & Geometrics of Curve and Bridge Before Junction of KY 2031 & KY 40
Item No. 12-0192.00

Prepared by KYTC
Division of Planning
District 12

January 2013

KENTUCKY TRANSPORTATION CABINET

I. PRELIMINARY PROJECT INFORMATION

County:	Martin	**Item No.:**	12-0192.00
Route Number(s):	KY 40	**Road Name:**	Inez-Warfield Road
Program No.:	87468	**UPN:**	FD04 080 0040 018-019
Federal Project No.:		**Type of Work:**	Reconstruction

2012 **Highway Plan Project Description:**

Improve alignment & geometrics of the curve located just before the junction of KY 2031/KY 40 to 0.1M before Gordon Hollow Rd & improve the culvert/safety design to increase motorist/pedestrian safety.

Beginning MP: 18.15 **Ending MP:** 18.4 **Project Length:** 0.25

Functional Class.: ☐ Urban ☑ Rural **State Class.:** ☐ Primary ☑ Secondary

Route is on: ☐ NHS ☐ NN ☐ Ext Wt

MPO Area: Not Applicable **Truck Class.:**

In TIP: ☐ Yes ☐ No **% Trucks:** 10

ADT (current): 4760 2011 **Terrain:**

Access Control: ☑ None ☐ Permit ☐ Fully Controlled ☐ Partial Spacing:

Median Type: ☐ Undivided ☐ Divided (Type): N/A

Existing Bike Accommodations: **Ped:** ☐ Sidewalk

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

KYTC Guidelines Preliminarily Based on : 45 **MPH Proposed Design Speed**

Roadway Data:	**EXISTING**	**COMMON GEOMETRIC PRACTICES***
No. of Lanes	2	2
Lane Width	10	12
Shoulder Width	4	4
Max. Superelevation**	N/A	8%
Minimum Radius**	N/A	600
Maximum Grade	4.4%	6%
Minimum Sight Dist.	N/A	360
Sidewalk Width(urban)	N/A	N/A
Clear-zone***	N/A	N/A

Existing Rdwy. Plans available? ☑ Yes ☐ No

Year of Plans: 1930

☐ Traffic Forecast Requested

Date Requested:

☑ Mapping/Survey Requested

Date Requested:

Type:

Project Notes/Design Exceptions?: The entire project is located within a floodplain.

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

Culvert No 10042	080B00001N	(Bridge #2)
Sufficiency Rating	46.9	
Total Length	51.8	
Width, curb to curb		
Span Lengths	24.9	
Year Built	1930	
Posted Weight Limit	N/A	
Structurally Deficient?	Yes	
Functionally Obsolete?	Yes	

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 2012 General Assembly's Enacted Highway Plan.

Funding	*Phase*	*Year*	*Amount*
SPP	Design	2014	$500,000
SPP	Right of Way	2016	$100,000
SPP	Utilities	2016	$220,000
SPP	Construction	2017	$1,150,000

B. Project Status

Design funds for this project have been approved.

C. System Linkage

KY 40 connects the city of Inez to the towns of Beauty and Warfield. The KY 40 corridor is currently being relocated. The new route will bypass this project and the town of Beauty. However, the entire corridor relocation is not scheduled to be open to traffic until approximately 2022.

D. Modal Interrelationships

This section of KY 40 is not located on a coal haul route. There are no bike routes located along this corridor.

E. Social Demands & Economic Development

KY 40 is a primary connector between the cities of Inez and Warfield. There has been slight economic growth in the city of Inez during the past few years. No major economic development is anticipated in either Inez or Warfield.

F. Transportation Demand

This section of KY 40 has a ADT of 4760. Increases in ADT is not expected in the future. The KY 40 corridor is currently being relocated and decreases in ADT are more likely to occur on this section.

II. PROJECT PURPOSE AND NEED (cont.)

G. Capacity

There are no known capacity issues with this section of KY 40 and traffic congestion will more than likely be alleviated with the completion of the relocation of KY 40.

H. Safety

A ten year review of collision data from M.P. 18.2 to M.P. 18.4 using the KY State Police Analysis Database was performed with the following results: 26 total crashes with 10 crashes causing 14 injuries. There has also been 1 fatality due to a vehicle running off the roadway and hitting the culvert.

I. Roadway Deficiencies

The culvert is classified as structurally deficient and functionally obsolete. The Sufficiency Rating is 46.9. According to the Structure Inventory and Appraisal Sheet there are some open cracks in the walls of the culvert. The approaches on each side of the culvert are located within curves. The curves and alignment geometrics on this section of KY 40 are substandard.

Draft Purpose and Need Statement:

Need: Substandard geometrics of the curve located near the junction of KY 2031 and deficiencies in the culvert contribute to safety issues with this section of KY 40.

Purpose: To improve safety through this section of KY 40 primarily through geometrics including a relocated alignment, construction of a new bridge and/or culvert, and a reconstructed intersection with KY 2031.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

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

STIP Pg.#: 31 **TIP Pg.#:**

This project is state funded, therefore it will not have a STIP or TIP Pg. #

B. Archeology/Historic Resources

☑ Known Archeological or Historic Resources are present

With the culvert having wet stone masonry abutments, it will be considered historic. A cultural historic survey will be required. Other historic resources could also be impacted depending on scope of project.

C. Threatened and Endangered Species

The Indiana Bat (Myotis Sodalis) is listed as threatened or endangered species in the for Martin County. Tree cutting restrictions or the Indiana Bat Programmatic Agreement can be implemented to satisfy Section 7 requirements.

D. Hazardous Materials

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

With the culvert being demolished, an inspection of the culvert for asbestos containing materials or lead paint will be required.

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

Stream impacts should be less than 300 L.F., resulting in a ACE LON.

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

G. Socioeconomic

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

Some relocations are possible depending on final alternate chosen.

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

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

This project is state funded, therefore 4(F) or 6(F) does not apply.

Anticipated Environmental Document: None (Completely State funded)

IV. POSSIBLE ALTERNATIVES

A. Alternative 1: No Build

This alternative does not address the needs identified.

B. Alternative 2: Replace Existing Structure and Construct New Alignment with 600' Radius

This alternative would remove the existing structure and either a culvert or bridge would be constructed with the new alignment shifted to the south of the existing alignment. Approximately 600' of KY 40 between M.P. 18.23 to M.P. 18.33 would be reconstructed with a 600' radius. An improved intersection with KY 2031 would also be constructed. With any improvements to this intersection, an existing drainage structure would be removed and a new structure would be constructed. The proposed alignment for KY 40 would include two (2) twelve (12') lanes with four (4') shoulders. The proposed design speed would be 45 MPH. There will be at least one relocation with this alternative.

Planning Level Cost Estimate:

Phase	Estimate
Design	$500,000
R/W	$311,400
Utilities	$300,000
Const	$1,155,585
Total	**$2,266,985**

IV. POSSIBLE ALTERNATIVES

C. Alternative 3: Replace Existing Structure and Construct New Alignment with 2000' Radius

This alternative would remove the existing structure and either a culvert or bridge would be constructed with the new alignment sifted to the south of the existing alignment. Approximately 1200' of KY 40 between M.P. 18.15 to M.P. 18.38 would be reconstructed with a 2000' radius. An improved intersection with KY 2031 would also be constructed. With any improvements to this intersection, an existing drainage structure would be removed and a new structure would be constructed. The proposed alignment for KY 40 would include two (2) twelve (12') lanes with four (4') shoulders. The proposed design speed would be 45 MPH. There will be at least one relocation with this alternative.

Planning Level Cost Estimate:

Phase	Estimate
Design	$500,000
R/W	$324,400
Utilities	$300,000
Const	$1,646,245
Total	**$2,770,645**

V. SUMMARY

This study is a Data Needs Analysis (DNA) of a reconstruction project to address safety and geometric deficiencies of a section of KY 40 in Martin County, Item Number 12-0192.00. 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:

- The No Build Alternative is not feasible due to the poor geometrics of the current alignment.
- The proposed design shall incorporate minimal right-of-way impacts.
- The proposed design must include improvements to the approach of KY 2031.
- Improvement of the geometrics of KY 40 is a primary goal.
- Maintenance of traffic will be a critical component of the proposed design.

Alt #	Description	D ($)(Fund)	R ($)(Fund)	U ($)(Fund)	C ($)(Fund)	Total ($mil)
1	No Build	0	0	0	0	0
2	Alignment with 600' Radius	500,000	311,400	300,000	1,155,585	2,266,985
3	Alignment with 2000' Radius	500,000	324,400	300,000	1,646,245	2,770,645
-	Current Hwy Plan Estimated Cost	500,000	100,000	220,000	1,150,000	1,970,000
-	Current Pre-Con Estimated Cost					

VI. TABLES AND EXHIBITS

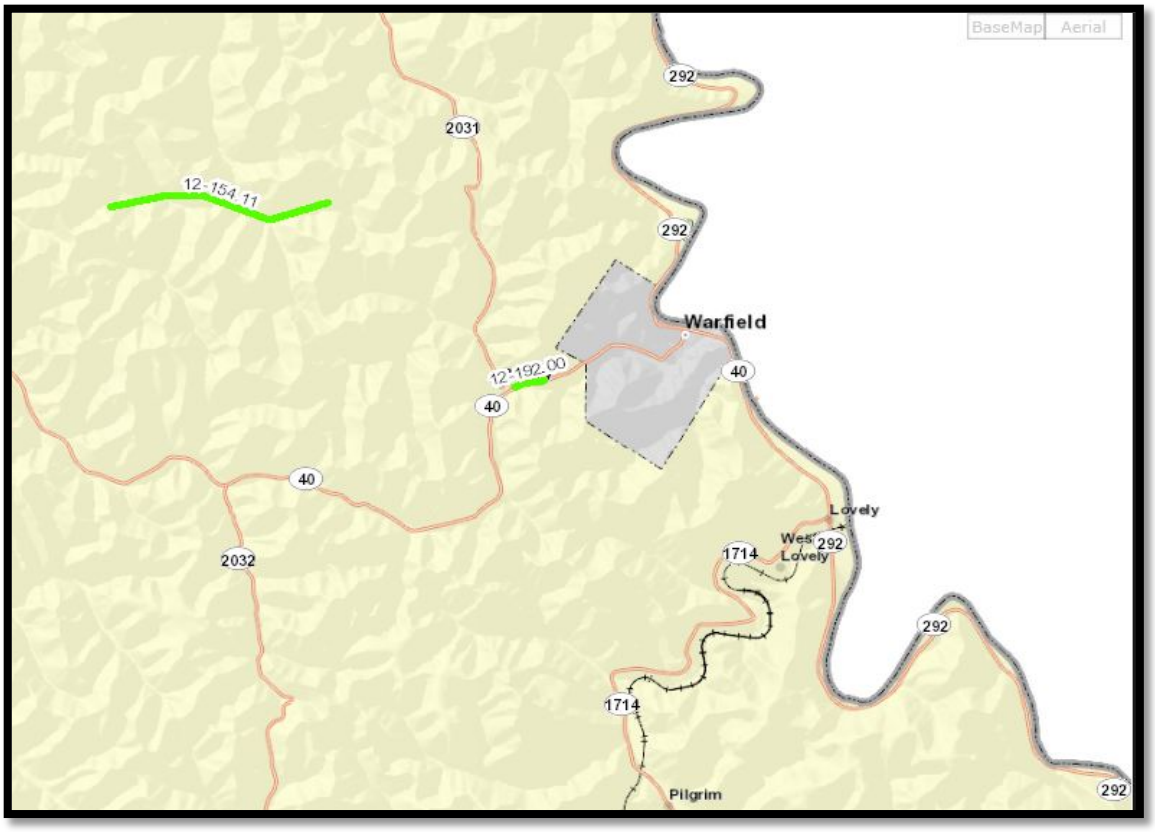


Exhibit 1: Project Location Map

VI. TABLES AND EXHIBITS (cont.)

Exhibit 2: Project

Exhibit 3: Existing Structure