

Data Needs Analysis

Marion County KY 1195 Item No. 4-1066.00



Prepared By: Kentucky Transportation Cabinet (KYTC) District 4

October 20, 2011

Table of Contents

I. INTRODUCTION	4
A. Study Purpose.....	4
B. Location	4
II. PROJECT PURPOSE AND NEED	6
A. Legislation.....	6
B. Project Status	6
C. System Linkage.....	7
D. Modal Interrelationships	9
E. Social Demands & Economic Development	9
F. Transportation Demand.....	9
G. Capacity	9
H. Safety	9
I. Roadway Deficiencies	10
III. PRELIMINARY ENVIRONMENTAL OVERVIEW.....	14
A. Air Quality.....	14
B. Archaeology.....	14
C. Threatened and Endangered Species.....	14
D. Hazardous Materials	14
E. Historic Resources	14
F. Permitting.....	14
G. Noise	14
H. Socioeconomic.....	14
I. Section 4(f) Resources.....	15
J. Section 6(f) Resources.....	15
IV. PRELIMINARY PROJECT INFORMATION.....	15
A. Existing Conditions/Roadway Data.....	15
B. Right of Way	16
C. Utilities.....	16

D. Agency Coordination.....	16
V. PROJECT PURPOSE AND NEED STATEMENT	17
VI. POSSIBLE ALTERNATIVES.....	17
A. No Build	17
B. Build in Place	17
C. Build in Place using Existing abutments.....	17
VII. Summary.....	18

LIST OF FIGURES

Figure1: Project Location Map.....	5
Figure 2: System Linkage Map	8
Figure 3: Bridge over Cartwright Creek Looking North.....	10
Figure 4: Bridge over Cartwright Creek (Pier and Beam).....	11
Figure 5: Field Entrance Looking South.....	12
Figure 6: Bridge after a Rain Event.....	13

LIST OF TABLES

Table 1 USWS Listing of Threatened and Endangered Species in Marion County.....	14
Table 2 Existing Conditions and Data Summary	15

LIST OF APPENDICES

- Appendix A - Exhibits
- Appendix B - UPL Project Information Forms
- Appendix C - KYTC’s Common Geometric Practices for Rural Arterial Roads
- Appendix D – Structure Inventory and Appraisal Sheets
- Appendix E – Project Team Minutes
- Appendix F – FIRM Map

I. INTRODUCTION

A. Study Purpose

The purpose of the Data Needs Analysis (DNA) is to address the nine elements of Purpose and Need as defined by NEPA in order to develop a draft Purpose and Need statement for the project. This study will also provide a more defined project scope, planning-level cost estimates for possible alternatives, an identification of potential environmental impacts, and other information that will be of assistance in the Project Development phase of this project.

B. Location

This bridge project is located along KY 1195 in Marion County. Bridge #078B00051N is located over Cartwright Creek approximately 0.884 miles north of the junction with US 68 (See **Figure 1**). A topographic map of the study area, Exhibit 1, can also be viewed in **Appendix A**.



Figure 1: Project Location Map

II. PROJECT PURPOSE AND NEED

A. Legislation

The following is a description of the projects as they are listed in the 2010 General Assembly's Enacted Roadway Plan.

Item #4-1066.00, Marion County

Phase Fund Year Estimate

D: BRX 2012 \$150,000 (Authorized)

R: BRX 2014 \$75,000

U: BRX 2014 \$125,000

C: BRX 2016 \$230,000

REPLACE BRIDGE ON KY 1195 (MP 0.884) OVER CARTWRIGHT CREEK; 0.80 MI NORTH OF JCT US 68; (STRUCTURALLY DEFICIENT, SR=44.3) 078B00051N

B. Project Status

The bridge is structurally deficient with sufficiency ratings of 44.3, as identified above. Design funds have been authorized. The Highway Plan Design year is listed as 2012.

Other Projects in the area include:

- 4-192.2, Marion County -Reconstruct US 68 from 4600' west of Hourigan Lane to 1200' west of Beech Fork Church Road (MP 0.44 to MP 1.697). This project is under currently under construction with an expected completion date in 2012.
- 4-8304, Marion County – Reconstruct KY 49 from Lebanon to the Caney Creek Bridge. Design funds have been authorized for this project.

Projects near the study site on the Unscheduled Projects List include:

- 04 078 B0068 77.00, Marion County – Reconstruct the Eastern Intersection at KY 2154 with Curb and Gutter and add Turn Lanes on KY 2154 (MP 12.25 to MP 12.400). This project is rated high by the District. Project Information Form (PIF) for this project can be viewed in **Appendix B.**

C. System Linkage

KY 1195 in this area connects US 68 east of Lebanon to US 150 east of Springfield (see **Figure 2**).

KY 1195 between US 68 and US 150 has the following roadway classifications:

- **Functional Classification** – Rural Minor Collector
- **State System** – Rural Secondary
- **Truck Weight Classification** – A
- Not a designated Bike Route

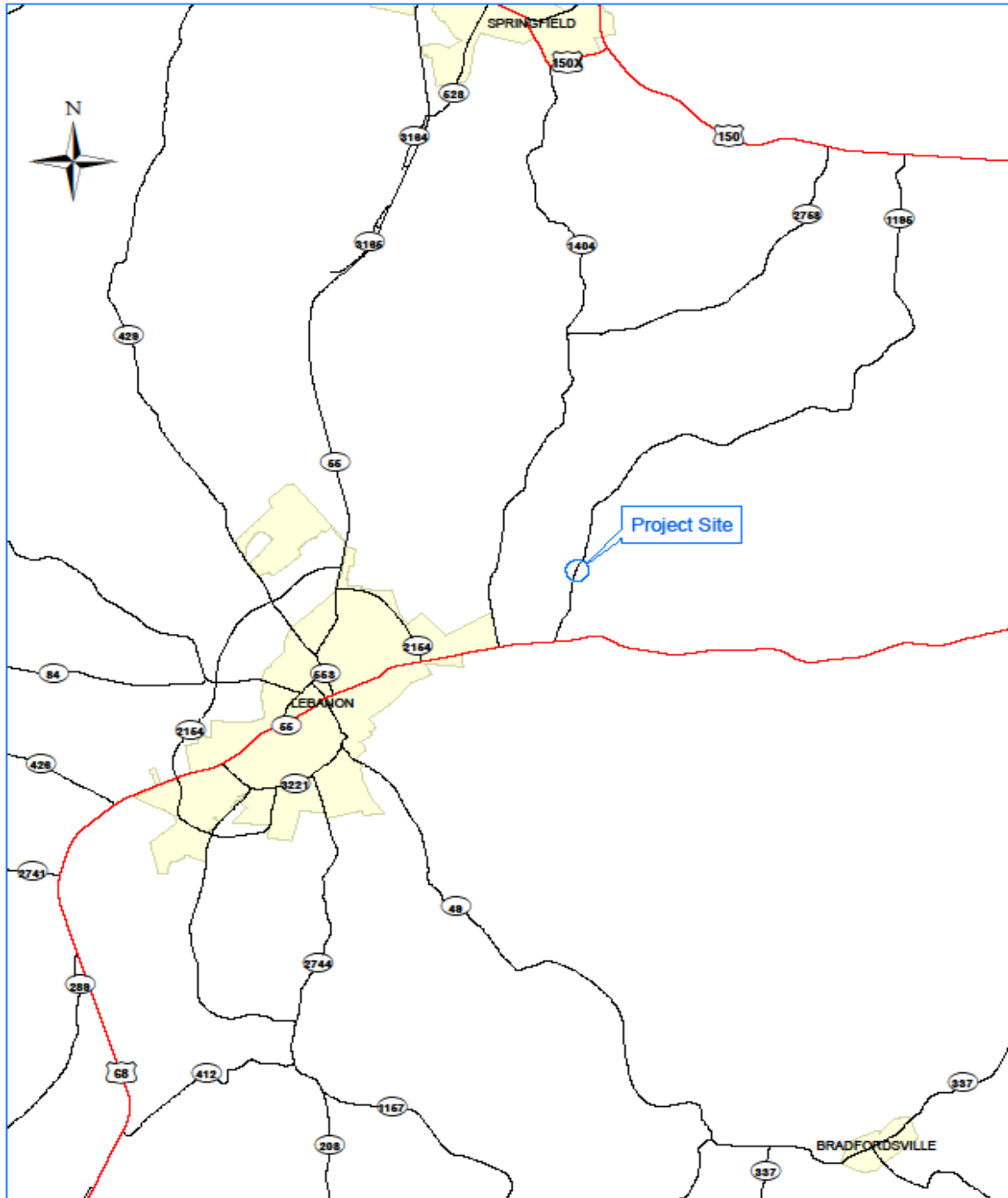


Figure 2: System Linkage Map

D. Modal Interrelationships

N/A

E. Social Demands & Economic Development

This is a rural route that is mostly agriculture and residential use. This is not an economic development corridor.

F. Transportation Demand

The last actual traffic count at this location was an ADT of 562 in 2010. The 20 year forecast is not likely to exceed 1000 vpd.

G. Capacity

Based on existing and expected future traffic, capacity is not an issue of concern on this project.

H. Safety

Collision data was obtained from the KY State Police database of collisions for a three year period of time from January 1, 2008 to August 31, 2011. There were 2 collisions reported in the project area during this three year time period. One of the accidents was a run off the road collision with a tree and the other was a collision with an animal. Weather did not appear to be a significant factor in the collisions. A 0.3 mile spot analysis was done at the project site which resulted in a 0.723 Critical Rate Factor.

I. Roadway Deficiencies

Within the project limits, the roadway currently has 9-ft lanes, 2 ft stabilized shoulders and approximately a 0% grade with a posted speed limit of 55 MPH. KYTC's Common Geometric Practices for Rural Collector Roads (see **Appendix C**) for this type of road recommends 11-ft lanes for a 60 MPH Design Speed and 5-ft graded shoulders. The roadway approach can be seen in **Figure 3**.



Figure 3: Bridge over Cartwright Creek Looking North

The bridge over Cartwright Creek is 49 feet long and 24 feet wide out to out (20.0 feet wide curb to curb). It is structurally deficient with a sufficiency rating of 44.3 and does not meet the guidelines stated above of 11-ft lanes and 5-ft shoulders. A Structure Inventory and Appraisal Sheet for this bridge can be found in **Appendix D**. Photographs of this bridge can be seen below in **Figure 4**.



Figure 4: Bridge over Cartwright Creek (Pier and Beam)

There is an existing entrance on the east side of Ky. 1195 south of the bridge. The sight distance from the entrance to the south is limited due to a large bank. The design team should consider removing the embankment or moving the entrance to improve the sight distance. See **Figure 5**.



Figure 5: Field Entrance Looking South

Flooding over the bridges has not been reported, and conveyance and debris does not seem to be a problem as can be seen in **Figure 6**.



Figure 6: Bridge after a Rain Event

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

Marion County is in attainment for all monitored air pollutants.

B. Archaeology

An archaeology Phase I survey will need to be completed in order to rule out any impacts to archaeological sites.

C. Threatened and Endangered Species

The USFWS has identified the known and potential presence of threatened and endangered species in Marion County (**Table 1**). During a site visit in July 2010 potential habitat was observed for the Indiana bat in the riparian corridor. The project is not in the vicinity of Tatum’s Cave. Therefore, section 106 consultations with USFWS can be satisfied with a No Effect finding for the Tatum Cave Beetle and impacts to Indiana Bat habitat can be mitigated through either tree cutting restrictions or payment to the IB conservation fund.

Table 1 – USFWS listing of Threatened and Endangered Species in Marion County.

Group	Species	Common name	Legal* Status
Marion County			
Mammals	<i>Myotis sodalis</i>	Indiana bat	E
Insects	<i>Pseudanopthalmus parvus</i>	Tatum Cave Beetle	C

D. Hazardous Materials

During a site visit on July 16, 2010, no properties were observed that would have a high probability of hazardous materials. However, due to the age of the bridges it should be tested for asbestos prior to demolition.

E. Historic Resources

The District Environmental Coordinator and the Division of Environmental Analysis Architectural Historian visited the site. The home located south of the bridge could potentially be eligible for the national register. However, there should be no adverse effect to the property by replacing the bridge.

F. Permitting

Any impacts below the ordinary highwater mark within Cartwright Creek will need a USACE 404 permit.

G. Noise

The scope of the project should not require additional noise analyses since there are no additional lanes of traffic planned for the facility.

H. Socioeconomic

No significant impact

I. Section 4(f) Resources

If the house to the south is determined to be eligible this would be a 4(f) resource

J. Section 6(f) Resources

IV. PRELIMINARY PROJECT INFORMATION

A. Existing Conditions/Roadway Data

A summary of the existing conditions can be seen in Table 2.

Table 2: Existing Conditions and Data Summary

Road Number	Ky 1195	ADT (current)	562
Road Name	Short Line Pike	Access Control	By Permit
Item	04-1066	Terrain	Rolling
BMP	0.834	Posted Speed	55 mph
EMP	0.934	Median	None
County	Marion	Funding	BRX
Functional Classification	Rural Minor Collector	State System	Rural Secondary
Truck Weight Classification	A		

Roadway Data:

No. of Lanes	2
Lane Width	9'
Shoulder Width	2'
Maximum Grade	0%
Design Speed	60 mph

Bridge Data:

Bridge Identification	078B00051N
Maximum Span Length	44.9'
Maximum Length	49'
Width (out to out)	24'
Width (curb to curb)	20'
Sufficiency Rating	44.3

B. Right of Way

Construction easements may be needed for this project.

C. Utilities

Windstream Communications
Barry Roberts, Group Supervisor
111 South Main Street
Elizabethtown, KY 42701

Inter-County RECC
Bud Griffith, Engineer
PO Box 87
Danville, KY 40423-0087

Marion County Water District
Jimmy Mudd, General Manager
PO Box 528
Lebanon, KY 40033

The project team confirmed that there are no gas or sewer lines near the project site. Confirmation of these locations should be verified as the project survey is completed in the Design phase.

D. Agency Coordination

The Project Team was given a list of items to consider on March 3, 2011 including alternate designs, bridge width and elevation, sight distance of an adjacent entrance, environmental and historic issues and duration of road closure. The team had several recommendations and concerns that were addressed and have been listed in **Appendix E**.

V. PROJECT PURPOSE AND NEED STATEMENT

Based upon the information presented in Section II of this report and discussion of the project team, the following purpose and need statement was drafted for these projects:

KY 1195 provides a connection between US 68 and US 150. The bridge located over Cartwright Creek is structurally deficient. There have not been very many collisions reported in this area however an entrance with substandard sight distance is adjacent to the bridge. **The purpose of this project is to address the structural deficiencies of this bridge and the sight distance of the adjacent entrance in order to provide safety, mobility and connectivity between US 68 and US 150.**

VI. POSSIBLE ALTERNATIVES

The following is a description of several of the alternatives analyzed and discussed during the development of this study.

A. No Build

The No Build option is not a feasible alternative due to the structural deficiency of the bridge. It would not address the draft purpose and need defined for this project.

B. Build in Place

One feasible option for this project is to replace the bridge in the current location due to the short length of road closure (60-90 days) and the short detour route (1.9 miles). However, the detour route would likely be a County Road (Hundley Lane). The bridge would be replaced with a bridge that is 24' curb to curb. This would include new piers put back at the current elevation. A bridge replacement in another location would require additional right of way and realignment of the roadway.

C. Build in Place using Existing Abutments

The Bridge Engineer determined that the abutments were not in good enough shape to salvage making this alternative not feasible.

Alternate B Cost Estimate

Design - \$150,000

Right of Way- \$75,000

Utilities-\$125,000

Construction - \$230,000

VII. Summary

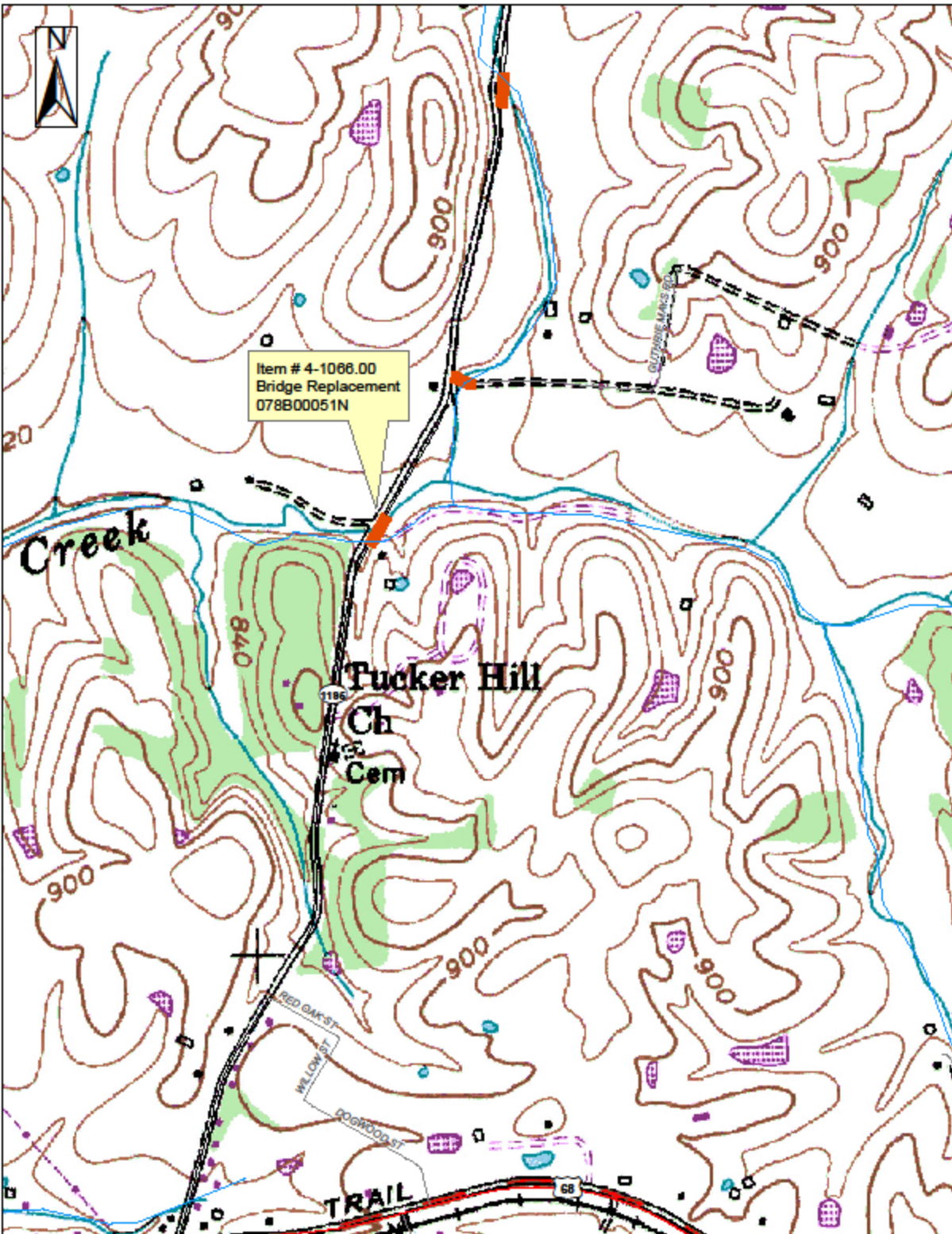
This study is a Data Needs Analysis (DNA) of a project located on KY 1195 just north of US 68 in Marion County. Bridge #078B00051N is located over Cartwright Creek. Through analysis of existing roadway geometrics, bridge ratings, crash data, site visits, and discussion with the project team the following needs were identified:

- The bridge located over Cartwright Creek is structurally deficient.
- There are very few reported collisions at this location however an entrance south of the bridge on the east side of KY 1195 has limited sight distance.
- There are no conveyance problems with the existing structures and the bridge piers do not accumulate large amounts of debris.

The purpose of this project is to address the structural deficiencies associated with this bridge and the limited sight distance of an adjacent entrance in order to provide safety, mobility and connectivity between US 68 and US 150.

Three possible alternatives for replacing the bridge are included in this study. The only viable alternative is to remove and replace the existing bridge in the current location to minimize cost of construction, right of way and utilities. The design should include a wider bridge and approaches with shoulders which would allow for more sight distance at the intersections with the adjacent entrance. The sight distance of the entrance should be addressed as part of this project by moving further to the south or removing embankment material to improve the sight lines. We would have to seek permission to utilize Hundley Lane as the detour route since the only State highway detour route would be very lengthy and likely not utilized by the public. The total cost of this project is around \$580,000 and the funding allocated in the Highway Plan should be sufficient.

Appendix A -Exhibits



Appendix B – UPL Project Information Form

PIF Revised: Aug. 2004

KYTC Project Identification Form

Cycle Year: 2007
 Priority: L: R: Hi D: Hi
 Tier: R: D:
 Tier Rank: R: D:
 Overall Top Ten: R: D:

Section I – General Information

Requested by: <u>Unknown</u> Title/Organization: Date:	UPL Control #: <u>04 078 B0068 77.00</u> Co. #: <u>078</u> Parent Control #: <u> </u> RSE Unique Number: <u>078 US-68</u>
Form Completed by: <u>Malham/K Young</u> Title/Organization: <u>LTADD/KYTC-D4</u> Date: <u>11/24/08</u>	District: <u>4</u> County: <u>Marion</u> Route: <u>US 68</u> ADD: <u>LTADD</u> MPO: <u> </u> SUA: <u>Lebanon</u>
Revision 1 by: Title/Organization: Date:	Mode: <u>Highway</u> State System: <u>State Secondary</u> Type: <u>Reconstruction</u> Funct'l Class: <u>Urban Mn Art</u>
Revision 2 by: Title/Organization: Date:	Project Length: <u>0.150</u> Total Cost Estimate: <u>\$ 1,500</u> (P: D:150 R:300 U:300 C:750)
Possible Funding Sources (Check all that apply): <input type="checkbox"/> IM <input type="checkbox"/> NH <input type="checkbox"/> HES <input type="checkbox"/> BR <input checked="" type="checkbox"/> STP <input checked="" type="checkbox"/> SP <input type="checkbox"/> TE <input type="checkbox"/> CMAQ <input type="checkbox"/> PLH <input type="checkbox"/> Other: <u> </u>	
Highway Networks (Check all that apply): <input type="checkbox"/> NN <input checked="" type="checkbox"/> Scenic Byway <input type="checkbox"/> Coal Haul <input checked="" type="checkbox"/> Non NHS <input type="checkbox"/> NHS <input type="checkbox"/> Defense <input type="checkbox"/> Strahnet <input type="checkbox"/> Ext. Wt. <input type="checkbox"/> ADHS () <input type="checkbox"/> Bike <input type="checkbox"/> Forest	
Existing Project Studies (Year): <u>2005 Heartland Parkway Study</u>	

Section II – Problem Statement

Route Number: <u>US 68</u> Beginning MP: <u>12.250</u> Ending MP: <u>12.400</u> Total Length: <u>0.150</u>	<table border="1"> <thead> <tr> <th>(Use Report Year)</th> <th>Original</th> <th>Rev. 1</th> <th>Rev. 2</th> </tr> </thead> <tbody> <tr> <td>Adequacy Rating:</td> <td>68.10: (06)</td> <td>: ()</td> <td>: ()</td> </tr> <tr> <td>• CRF: (Year)</td> <td>0.86: (06)</td> <td>: ()</td> <td>: ()</td> </tr> <tr> <td>• IRI: (Year)</td> <td>127: (06)</td> <td>: ()</td> <td>: ()</td> </tr> <tr> <td>• V/SF: (Year)</td> <td>0.39: (06)</td> <td>: ()</td> <td>: ()</td> </tr> <tr> <td>Current ADT: (Year):</td> <td>12,000: (07)</td> <td>: ()</td> <td>: ()</td> </tr> <tr> <td>Percent Trucks: (Year):</td> <td>7.9: (07)</td> <td>: ()</td> <td>: ()</td> </tr> <tr> <td>Projected ADT (HDO): Year:</td> <td>%Growth:</td> <td>ADT:</td> <td></td> </tr> </tbody> </table>	(Use Report Year)	Original	Rev. 1	Rev. 2	Adequacy Rating:	68.10: (06)	: ()	: ()	• CRF: (Year)	0.86: (06)	: ()	: ()	• IRI: (Year)	127: (06)	: ()	: ()	• V/SF: (Year)	0.39: (06)	: ()	: ()	Current ADT: (Year):	12,000: (07)	: ()	: ()	Percent Trucks: (Year):	7.9: (07)	: ()	: ()	Projected ADT (HDO): Year:	%Growth:	ADT:	
(Use Report Year)	Original	Rev. 1	Rev. 2																														
Adequacy Rating:	68.10: (06)	: ()	: ()																														
• CRF: (Year)	0.86: (06)	: ()	: ()																														
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Current ADT: (Year):	12,000: (07)	: ()	: ()																														
Percent Trucks: (Year):	7.9: (07)	: ()	: ()																														
Projected ADT (HDO): Year:	%Growth:	ADT:																															

Please provide a clear problem statement for this project:

The Adequacy Rating for this section of US 68 is 68.10, indicating that about 32% of similar roadway segments in the state are in better condition. The CRF of 0.86 is nearing the threshold of a possible safety issue. The IRI of 127 indicates potential pavement concerns. The Lebanon Bypass project (4-125.10) was recently constructed which may increase the amount of traffic flowing through this intersection.

Section III – Project Description

Project Description Narrative:

Reconstruct intersection at KY 2154 with curb and gutter and add turn lanes on KY 2154.

Regional Goals/Objectives Addressed: I - Improve the overall safety of the LTADD regional transportation system. III - Preserve, maintain and enhance the existing transportation system to ensure reliable, efficient and effective mobility.

Appendix C – KYTC’s Common Geometric Practices for Rural Collector Roads

EXHIBIT 700-02												
COMMON GEOMETRIC PRACTICES RURAL COLLECTOR ROADS												
		TRAFFIC VOLUME										
		TERRIAN	UNDER 400 A.D.T.			400-2000 A.D.T.			OVER 2000 A.D.T.			
MINIMUM DESIGN SPEED (M.P.H.)	⑦	LEVEL	40			50			60			
		ROLLING	30			40			50			
		MOUNTAIN	20			30			40			
PAVEMENT WIDTH (FEET)	① ⑧	DESIGN SPEED	UNDER 400 A.D.T.		400-1500 A.D.T.		1500-2000 A.D.T.		OVER 2000 A.D.T.			
		20 MPH	20 ⑨		20		22		24			
		25 MPH										
		30 MPH										
		35 MPH										
		40 MPH	20		22		24		24			
		45 MPH										
		50 MPH	22		22		24		24			
		55 MPH										
60 MPH	22		22		24		24					
MINIMUM GRADED SHOULDER WIDTH (FEET)	⑥	ALL SPEEDS	2		5 ⑩		6		8			
MIN. CLEAR ROADWAY WIDTH OF NEW AND RECONSTRUCTED BRIDGES		ALL SPEEDS	APPROACH ROADWAY WIDTH									
MINIMUM RADIUS (FEET)		DESIGN SPEED	eMAX. 4%			eMAX. 6%			eMAX. 8%			
		20 MPH	125			115			105			
		25 MPH	205			185			170			
		30 MPH	300			275			250			
		35 MPH	420			380			350			
		40 MPH	565			510			465			
		45 MPH	730			660			600			
		50 MPH	930			835			760			
		55 MPH	1190			1065			965			
		60 MPH	1505			1340			1205			
NORMAL PAVEMENT CROSS SLOPES	④	RATE OF CROSS SLOPE = 2%										
NORMAL SHOULDER CROSS SLOPES		EARTH = 8%					PAVED = 4%					
MAXIMUM GRADE (PERCENT)	⑤	M.P.H.	20		25		30		35		40	
		LEVEL	10		11		7		9		8	
		ROLLING	12		11		9		10		8	
MOUNTAIN	12		11		9		10		8			
MINIMUM STOPPING SIGHT DISTANCE	②	(FEET)	115		155		200		250		305	
MINIMUM PASSING SIGHT DISTANCE	③	(FEET)	710		900		1090		1280		1470	
		(FEET)	1625		1835		1985		2135		2135	

① WIDEN PAVEMENT ON CURVES IN ACCORDANCE WITH APPROVED DESIGN STANDARDS. REFER TO CURRENT STANDARD DRAWING FOR ADDITIONAL DETAIL.

② MINIMUM STOPPING SIGHT DISTANCE BASED ON HEIGHT OF EYE OF 3.5 FT AND HEIGHT OF OBJECT OF 2.0FT. CONSIDER BOTH HORIZONTAL AND VERTICAL ALIGNMENTS.

③ MINIMUM PASSING SIGHT DISTANCES BASED ON HEIGHT OF EYE 3.5 FT AND HEIGHT OF OBJECT OF 3.5 FT. CONSIDER BOTH HORIZONTAL AND VERTICAL ALIGNMENTS.

④ NORMAL PAVEMENT CROSS SLOPES ON BRIDGES IS 2%.

⑤ MAY USE ONE PERCENT STEEPER MAXIMUM GRADES ON SHORT LENGTHS (LESS THAN 500 FT) AND ON ONE-WAY DOWN GRADES.

⑥ WIDEN 3 FT FOR GUARDRAIL.

⑦ DOCUMENT AND RETAIN JUSTIFICATION FOR A DESIGN SPEED LESS THAN THE REGULATORY OR POSTED SPEED IN THE PROJECT FILES.

⑧ ON ROADWAYS TO BE RECONSTRUCTED, A 22 FT TRAVELLED WAY MAY BE RETAINED WHERE THE SAFETY RECORDS AND ALIGNMENT ARE SATISFACTORY.

⑨ 18 FT MINIMUM WIDTH MAY BE USED FOR ROADWAYS WITH DESIGN VOLUMES UNDER 250 A.D.T.

⑩ SHOULDER WIDTH MAY BE REDUCED FOR DESIGN SPEEDS GREATER THAN 30 MPH PROVIDED A MINIMUM ROADWAY WIDTH OF 30 FT IS MAINTAINED.

3-25-2004

Appendix D – Structure Inventory and Appraisal Sheets

N: Bridges : Todd Lawler : State Bridge Pres : 078 State Pres : 078 B3971V

KYTC

Bridge Maintenance
Bridge Maintenance

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 9750 Agency ID: 078B00051N SR: 44.3 SD/FO: SD

IDENTIFICATION				INSPECTION														
State 1:	21 Kentucky	Struc Num 8:	078B00051N	Frequency 91:	24 months	Inspection Date 92:	1/11/2010											
Facility Carried 7:	KY-1195	Location 9:	.80 MI NOR. OF JCT US 68	FC Frequency 92A:	NA	FC Inspection Date 93A:	NA											
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	3 State Hwy	UW Frequency 92B:	NA	UW Inspection Date 93B:	NA											
Level of Service 5C:	1 Mainline	Rte. Number 5D:	01195	SI Frequency 92C:	NA	SI Date 93C:	NA											
Directional Suffix 5E:	0 N/A (NBI)	% Responsibility:	Unknown	Element Frequency:	24 months	Element Inspection Date:	01/11/2010											
SHD District 2:	District 4	County Code 3:	Marion (078)	Next Inspection:		Next FC Inspection:	NA											
Place Code 4:	FIPS 0000	Mile Post 11:	0.684 mi	Next UW Inspection:		Next SI:	NA											
Feature Intersected 6:	CARTWRIGHTS CREEK			Next Elem. Insp. Due:	01/11/2012													
Latitude 16:	37d 35' 20"	Longitude 17:	085d 12' 20"															
Border Bridge Code 98:	Unknown (P)																	
Border Bridge Number 99:																		
STRUCTURE TYPE AND MATERIALS				CLASSIFICATION														
Number of Approach Spans 40:	0	Number of Spans Main Unit 45:	1	Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No bridge exists											
Main Span Material/Design 43A/B:				Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)											
1 Concrete		04 Tee Beam		Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough											
Deck Type 107:	1 Concrete-Cast-in-Place			Toll Facility 20:	3 On free road	Functional Class 28:	08 Rural min Collector											
Wearing Surface 108A:	6 Bituminous			Defense Hwy 110:	0 Not a STRAHNET hwy	Historical Significance 37:	5 Not eligible for NRHP											
Membrane 108B:	0 None			Owner 22:	01 State Highway Agency													
Deck Protection 108C:	None			Custodian 21:	01 State Highway Agency													
AGE AND SERVICE				CONDITION														
Year Built 27:	1951	Year Reconstructed 106:	0	Deck 58:	6 Satisfactory	Super 59:	6 Satisfactory											
Type of Service on 42A:	1 Highway			Culvert 62:	N N/A (NBI)	Sub 60:	6 Satisfactory											
Type of Service under 42B:	5 Waterway			Channel/Channel Protection 61:			7 Minor Damage											
Lanes on 28A:	2	Lanes Under 28D:	0															
ADT 29:	582	Truck ADT 109:	%															
		Year of ADT 30:	2010															
		Detour Length 19:	1.9 mi															
GEOMETRIC DATA				LOAD RATING AND POSTING														
Length Max Span 48:	44.9 ft	Structure Length 49:	49.0 ft	Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress											
Curb/Sdwk Width L 50A:	2.0 ft	Curb/Sidewalk Width R 50B:	2.0 ft	Inventory Rating 68:	HS6.7	Operating Rating 64:	HS19.5											
Width Curb to Curb 51:	20.0 ft	Width Out to Out 52:	24.0 ft	Design Load 31:	2 M 13.5 (H 15)	Posting 70:	5 A/Above Legal Loads											
Approach Roadway Width 32:	16.1 ft	Median 33:	0 No median (w/ shoulders)	Posting status 41:	A Open, no restriction													
Deck Area:	1,178. sq. ft																	
Skew 34:	30.00 °	Structure Flared 35:	0 No flare															
Vertical Clearance 10:	99.89 ft	Horiz. Clearance 47:	19.89 ft															
Minimum Vertical Clearance Over Bridge 53:			328.1 ft															
Minimum Vertical Underclearance Reference 54A:			N Feature not hwy or RR															
Minimum Vertical Underclearance 54B:			0.0 ft															
Minimum Lateral Underclearance Reference R 55A:			N Feature not hwy or RR															
Minimum Lateral Underclearance R 55:			0.0 ft															
Minimum Lateral Underclearance L 56:			0.0 ft															
PROPOSED IMPROVEMENTS				APPRAISAL														
Bridge Cost 94:	\$ 158,000	Type of Work 75:	31 Rep-Load Capacity	Bridge Rail 35A:	0 Substandard	Approach Rail 36C:	0 Substandard											
Roadway Cost 95:	\$ 0	Length of Improvement 76:	4.9 ft	Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard											
Total Cost 96:	\$ 158,000	Future ADT 114:	665	Str. Evaluation 67:	2	Deck Geometry 68:	3 Intolerable - Correct											
Year of Cost Estimate 97:	1994	Year of Future ADT 115:	2030	Underclearance, Vertical and Horizontal 69:	N Not applicable (NBI)													
				Waterway Adequacy 71:	7 Above Minimum	Approach Alignment 72:	6 Equal Min Criteria											
				Scour Critical 113:	8 Stable Above Footing													
NAVIGATION DATA				ELEMNT CONDITION STATE DATA														
Navigation Control 38:	0 Permit Not Required			Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft	1	13/1	Unp Conc Deck/AC Owl	(SF)	980	100 %	980	0 %	0	0 %	0	0 %	0	0 %	0
Pier Protection 111:	1 Not Required	Lit. Bridge Vertical Clearance 116:		1	110/1	R/Conc Open Girder	(LF)	196	0 %	0	100 %	196	0 %	0	0 %	0	0 %	0
				1	215/1	R/Conc Abutment	(LF)	114	0 %	0	100 %	114	0 %	0	0 %	0	0 %	0
				1	331/1	Conc Bridge Railing	(LF)	98	0 %	0	100 %	98	0 %	0	0 %	0	0 %	0
				1	359/1	Softfit Smart Flag	(EA)	1	0 %	0	0 %	0	100 %	1	0 %	0	0 %	0
				1	903/1	RC Curb	(LF)	98	0 %	0	100 %	98	0 %	0	0 %	0	0 %	0

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Fri 9/23/2011 13:44:19

Page 1 of 3

Appendix E – Project Team Notes

4-1066 Project Team Recommendations

David Kemper-

I wouldn't build a 20' wide bridge. Allow for the future, I would suggest 24'-26' horizontal clearance.

- -24' Curb to Curb bridge was suggested in the study.

I'm not aware of any flooding issues at this location, so current elevation should be fine.

I believe if we can improve sight distance, within a reasonable cost, we should.

- -The study recommends moving the entrance or removing embankment material to improve sight distance.

It seems like a project of this nature, with a road closure, should be able to be completed in 60-90 days.

Brad Eldridge-

-What is making the bridge deficient? Recommend back in place or right beside opposite side of entrance.

- The study recommends replacing the bridge in the same location.

-Filling out Project Scoping Summary, TC 61-6, and Exhibit 200-03 may help.

-Looks like on solid rock. Can salvage abutments? Let as a maintenance deck replacement project? Kevin Martin had similar project.

- The Bridge Engineer evaluated the structure and none of the bridge can be salvaged.

-End treatment for entrance Guardrail and entrance may be tricky. Relocating entrance possible?

- The study recommends moving the entrance.

-What is crash data in area?

-What is 100 year flood? Any overtopping or debris issues?

- No overtopping or debris issues have been reported.

-What design exceptions are being considered?

Marshall Carrier-

- 1) One thing that may need to be investigated when you guys get around to it is whether or not this bridge is located in a floodway. Not just a floodplain but also a “floodway”. If this is the case, then there are some additional design criteria that must be met. This would also merit some communication with FEMA. If it is, let me know and I will help you guys out with that.
 - After further research Marshall determined that this was not a floodway.
- 2) As far as the elevation of the bridge, it seems as though the higher water surface elevations would pour over into the floodplain before overtopping the bridge. If this is the case, then we can probably go back with the same elevation as the existing bridge – assuming that the hydraulics of the proposed bridge doesn’t adversely result in increased flood elevations that are excessive or cause issues throughout the area. You are allowed 1’ rise in 100 yr water surface elevation if the bridge is located in a floodplain. However if it is in a floodway, you cannot raise the WSEL for the 100 yr at all!! This becomes a more difficult design due to the hydraulics. Looking at the pictures, I don’t think this will be too much of an issue.
- 3) If road closure is an issue, you can always look at Conspan structures as a bid alternate.
 - Technically if you only sign a state highway detour then this will be very lengthy for residents to the North of the project. They will have to travel north to US 150 and west to KY 2758, then west to KY 1404 and then westerly to US 68. However, the local traffic will likely utilize Hundley Lane to travel south to US 68. The county should be notified of this likely increase in traffic for the duration of the road closure.

Appendix F – FIRM Map

