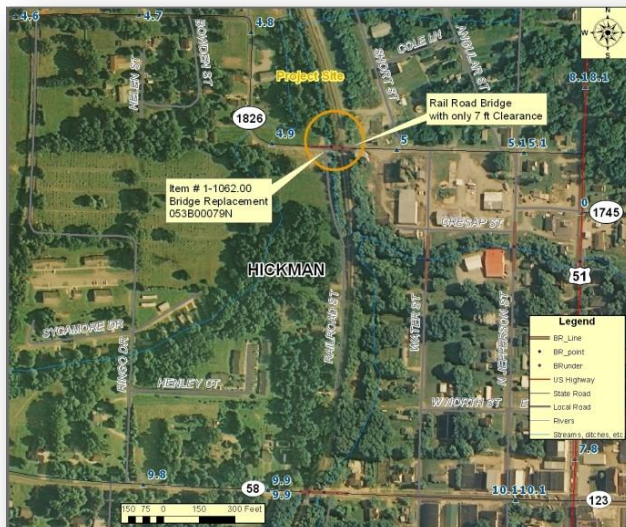


2012

KY-1826 Bridge Replacement DNA Study



Hickman County
Prepared by:
Kentucky Transportation Cabinet
Central Office and District-1
Division of Planning
Item No. 01-1062.00



I. PRELIMINARY PROJECT INFORMATION

County:	Hickman	Item No.:	01-1062.00
Route Number(s):	KY-1826	Road Name:	Depot Street
Program No.:	8609601D	UPN:	FD52 53 1826 004-005
Federal Project No.:	BRZ0103(299)	Type of Work:	Bridge Replacement

2010 Highway Plan Project Description:

Replace Bridge and Approaches on KY-1826 over Town Creek (B79) in Clinton. (Structural Deficient, SR=24.4) 053B00079N

Beginning MP: 4.9 **Ending MP:** 5 **Project Length:** 0.15

Functional Class.: Urban Rural
State Class.: Primary Secondary
Route is on: NHS Nat'l Truck Network

MPO Area: Not Applicable
Truck Clas: NHS Nat'l Truck Network
% Trucks: 0%

ADT (current): 555
Terrain: Primary Secondary
Access Control: Fully Controlled (None) Permit Partial Spacing:

Median Type: Undivided Divided (Type):
Existing Bike Accommodations: Sidewalk

Posted Speed: 35 mph 45 mph 55 mph Other (Specify): 25 mph

KYTC Guidelines Preliminarily Based on : 25 MPH Proposed Design Speed

Roadway Data:	EXISTING	COMMON GEOMETRIC	
No. of Lanes	2	2	Existing Roadway Plans available?
Lane Width	9 ft	10 ft	
Shoulder Width	3 ft	5ft	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Max. Super elevation**		8%	Year of Plans: _____
Minimum Radius**	45.9	170	<input checked="" type="checkbox"/> Traffic Forecast Requested
Maximum Grade	0%	7%	Date Requested: 2/27/2012
Minimum Sight Dist.		155	<input type="checkbox"/> Mapping Requested
Sidewalk Width(urban)	?? Ft	Pedway bridge attached Type:	Date Requested: _____
Clear-zone***	N/A		

Elevated Railroad Bridge w/only 7 ft clearance is located Adjacent to this Bridge Project. Railroad Bridge to be replaced 2013-2014.

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.*:	053B00079N	Existing Geotech data available?
Sufficiency Rating	23.5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Total Length	29.9 ft	
Width, curb to curb	23.0 ft	Width, Out to Out=24ft
Span Lengths	26.9 ft	
Max. Span Length	26.9 ft	
Year Built	1979	
Posted Weight Limit	10 Tons	
Structurally Deficient?	Yes	
Functionally Obsolete?	No	

* If more than 2 bridges are present on project, see attached sheets.

II. PROJECT PURPOSE AND NEED

A. Legislation

The 2010 General Assembly's Enacted Highway Plan listed only BRX Design funds for \$500,000. The following estimates are in the 2012-2018 Recommended Highway Plan.	<i>Funding</i>	<i>Phase</i>	<i>Year</i>	<i>Amount</i>
	BRX	D	2012	\$500,000
	BRX	R	2013	\$250,000
	BRX	U	2013	\$600,000
	BRX	C	2016	\$2,500,000

B. Project Status

Design funds for this Structurally Deficient bridge were authorized near the end of January 2012. There is an above grade railroad bridge overpass located adjacent to this bridge project that is scheduled for replacement in 2013-2014. Not only does is this adjacent railroad bridge limit KY 1826 to a 7 ft height clearance, but the spoil from this railroad bridge has entered the roadway to the point where only one lane is being utilized.

C. System Linkage

This segment of KY 1826 connects the Northwestern side of Hickman County the Northern side of the City of Clinton. This segment also connects the Northwestern most portion of the City of Clinton to the rest of the City of Clinton.

D. Modal Interrelationships

There is no public transit on the route. The nearest Rail Line is the adjacent Canadian National-Illinois Central (CNIC) that runs North/South through the City of Clinton on the West side of US-51. The amount of traffic generated on this route by the Rail Line is unknown. An elevated Railroad Bridge w/only 7 ft clearance is located Adjacent to this project's highway bridge. The adjacent railroad bridge is scheduled to be replaced sometime between 2013-2014.

E. Social Demands & Economic Development

There is a cemetery located southwest of the project site and this route connects a residential and rural area of Hickman County to the City of Clinton.

F. Transportation Demand

This section of KY-1826 has generally followed a 0.5% growth rate with a significant increase sometime between 1988 and 2001. The last actual traffic count ADT was 551 in 2009.

II. PROJECT PURPOSE AND NEED (cont.)

G. Capacity

There does not appear to be a concern with current congestion or future ADT at this time. No data was available to determine the Volume to Service Flow Ratio (VSF), which is used to measure capacity based on functional class.

H. Safety

There were only two collisions along this segment of KY-1826 identified on the Kentucky State Police Crash Database between June 1, 2006 and May 31, 2011. Neither of these two collisions were located near the bridge being proposed for replacement. One was a single vehicle collision with a fixed object that occurred near MP 3.2 and the other was a sideswipe from the opposing direction with one parked vehicle near the intersection of KY-1826 & US-51 in the City of Clinton.

I. Roadway Deficiencies

This bridge was built in 1979. Flooding is known to occur in the area of this bridge with high water overtopping the superstructure. In 2005, this bridge had the weight carrying capacity changed to 10 tons for all traffic due to the poor condition of the superstructure (rusty/reduced steel beams) and the substructure (rotten timber pilings). The most recent Structural Inventory and Appraisal Sheet dated 5/12/2011 listed the following: Superstructure rated Poor, Substructure rated Poor, Deck rated fair, and Minor Damage to Channel Protection. The overpass of the rail road bridge to that of KY-1826 is located immediately east of this project bridge and west of the project bridge is the intersection of KY-1826 and the local roadway known as Railroad Street.

Purpose and Need Statement:

Need: The need for this project is to eliminate the structural deficiency of the bridge, which has a Sufficiency Rating of 23.50.

Purpose: The purpose of this project is to provide a bridge connection for ensuring mobility and safe connectivity between the Northwestern side of Hickman County to the North side of the City of Clinton.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

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

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TIP Pg.#:

No air quality issues are expected.

B. Archeology/Historic Resources

Known Archeological or Historic Resources are present

Historic home sites where the homes have been demolished are adjacent to the project and may need to be reviewed for archaeology depending on the footprint of the project. Cemetery to the SW should not pose any issues due to the distance from the bridge. Some older homes are in the area but are not believed to be eligible for the National Register. They will need to be reviewed by the SME for Cultural/Historic.

C. Threatened and Endangered Species

Myotis sodalis, Indiana Bat(903)(IB); Potamilis capax, fat pocketbook (418)(FPBM); Lampsilis abrupta, pink mucket (409)(PMM); Etheostoma chienense, relict darter (501)(RD); Scaphirynchus alba, pallid sturgeon (506)(PS); Sterna antillarum, interior least tern (802)(ILT). This site is within an IB maternity polygon and any tree removal will have to utilize tree cutting restrictions or an IBC-MOA agreement with USFWS. Other issues are not expected, but DEA Biologist will have to be consulted.

D. Hazardous Materials

Potentially Contaminated Sites are present Potential Bridge or Structure Demolition

Bridge will need to be tested /examined for asbestos containing material before demolition. No other UST/Hazmat issues expected.

G. Permitting

Check all that may apply: Waters of the US MS4 area Floodplain Imp Navigable Waters of the US Impact
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 located within the drainage are for Clinton City water. Strict erosion control methods will be required. City water pumps are located just to the east of the project site.

H. Noise

Are noise sensitive receivers adjacent to the proposed project? Yes No

Several homes are nearby, but no noise impacts are expected except during construction.

I. Socioeconomic

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

Area is listed as having low income minority population. Railroad Street at the bridge serves several homes and will need to be kept open during construction since there is no other access. This will also apply to the house to the North.

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

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

Not applicable.

Anticipated Environmental Document:

CE Level 1



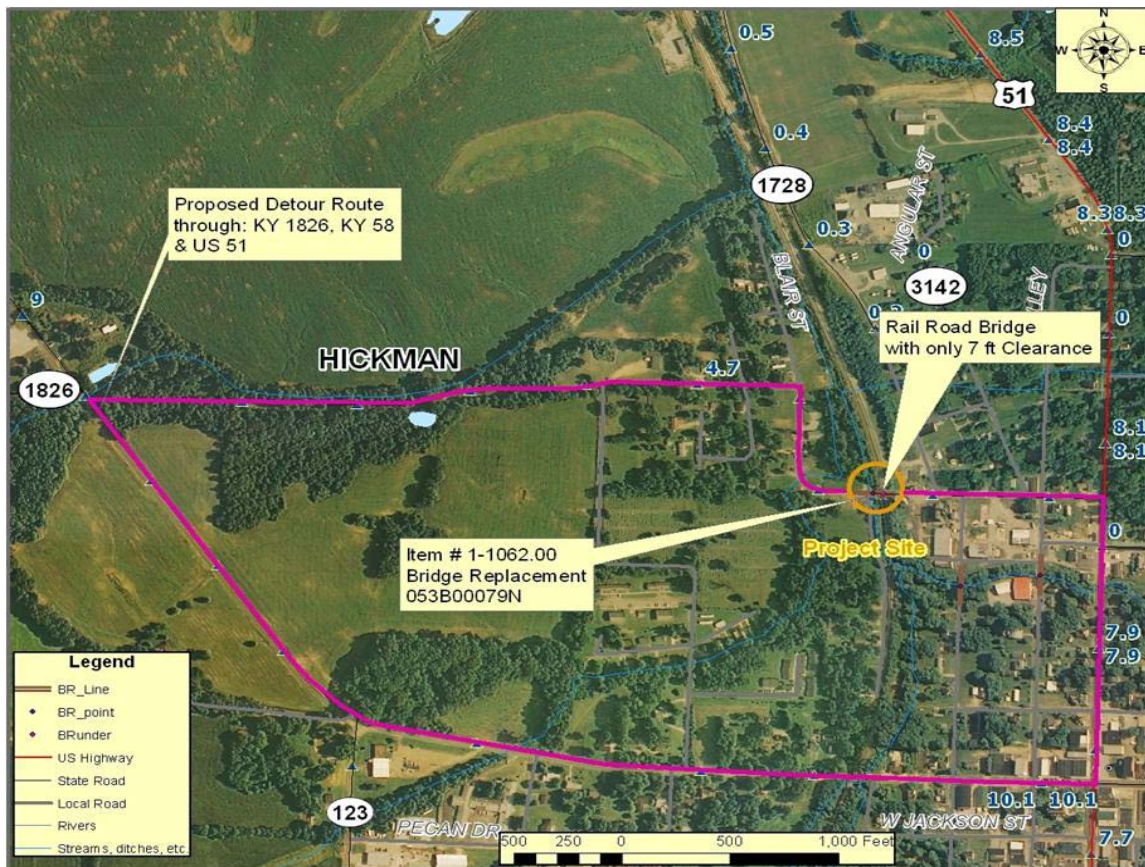
IV. POSSIBLE ALTERNATIVES

A. Alternative 1: No Build

This alternative does not meet the Purpose and Need of the project as structural deficiency rating will continue to decline until which time the bridge will be closed. This closure will create a permanent 2.3 mile re-direction of traffic, which may also impact pedestrian access in the future. See figure below.

B. Alternative 2A: Build Bridge In-Place with Road Closed Temporarily

This alternative proposes to build in place a new bridge & approaches with associated walkway over a blue line stream. This option will require that this portion of KY-1826 be temporarily closed down until the new structure is complete and ready for service. This closure could take up to 6 months depending on the type of bridge replacement selected during the Design Phase. This alternative would require the temporarily redirecting of traffic onto KY-58 and US-51 for a total rerouting of 2.3 miles, as shown below. Consideration must also be given to limiting this replacement to summer months, preferably while school is out in an attempt to minimize the impacts from possible school aged pedestrians and for construction to take place during a time of less precipitation. Some consideration was also given by the project team as to the possible impacts of the railroad raising the elevation clearance of their bridge from the current 7 ft that is now limiting access. The District met with the railroad liaison and determined the existing railroad bridge is scheduled for replacement between 2013 and 2014. It was also concluded that raising the elevation of the future railroad bridge to allow for more clearance would result in too significant a financial impact on the Railroad. The other option, if the railroad bridge could not be raised would be to lower the elevation of the current roadway and proposed bridge. Unfortunately, this section of roadway is well within the 100 year flood and has already been flooded on several occasions over the last few years. The vast majority of utilities in this location are situated on the northern side of the project bridge to include: water, sewer, gas lines as well as overhead electric. On the south side of the project bridge, an overhead telephone and cable line are present. See Exhibits 6-14 for greater photographic detail.



PROJECT SITE & DETOUR 2.3 MILES

IV. POSSIBLE ALTERNATIVES (Cont.)

C. Alternative 2B: Build Bridge In-Place with Adjacent Temporary Structure

This alternative poses the same setting characteristics as the previous Alternative 2A but with the initial proposed approach of adding a temporary structure adjacent to the existing bridge verses closing the roadway during construction. With this alternative however, the distance between the toe of slope for the railroad fill material and that of the existing or proposed replacement bridge has a maximum spacing of approximately 5 feet. As such, this alternative was no longer considered feasible given the limited spacing available to re-route traffic.

Planning Level Cost Estimate:

Structure Type	Preliminary Estimated Construction Times	Construction	Design	Right of Way	Utilities	Total
Slab Bridge (Assumes no work at RR crossing)	5.0 Months	\$ 750,000	\$ 500,000	\$ 200,000	\$ 400,000	\$ 1,850,000
Pre Cast Arch (Assumes no work at RR crossing)	2.0 Months	\$ 600,000	\$ 500,000	\$ 250,000	\$ 400,000	\$ 1,750,000
Double Box Culvert (Assumes no work at RR crossing)	3.5 Months	\$ 675,000	\$ 500,000	\$ 250,000	\$ 400,000	\$ 1,825,000
Low Water Ford w/Shoring (addresses RR crossing)	6.0 Months	\$ 1,950,000	\$ 500,000	\$ 150,000	\$ 400,000	\$ 3,000,000

D. Alternative 3: Build a new structure with a new alignment to the North

This alternative proposes moving the alignment to the north of the existing bridge. This option is not reasonable in part due to the majority of the utilities being located just north of this proposed bridge replacement. Also, there is not sufficient length between the toe of slope of the railroad fill and that of the current or proposed bridge replacement to allow for the redirecting of traffic. As a result, the adjacent railroad bridge has established the current alignment as the only viable alternative.

E. Alternative 4: Build a new structure with a new alignment to the South

This alternative has the same issues as that of Alternative 3 but without as many utility constraints. Unfortunately, this options is also not reasonable as there is not sufficient distance between the toe of slope of railroad fill material and that of the existing or proposed replacement bridge to allow for a redirecting of traffic for an adjacent temporary structure to the south. As a result, the proximity of the adjacent railroad bridge has established the current alignment as the only viable alternative.

IV. POSSIBLE ALTERNATIVES (Cont.)

V. Summary

This study is a Data Needs Analysis (DNA) of a bridge replacement project along a portion of KY-1826 in Hickman County within the City of Clinton, Kentucky, that is identified as Item Number 1-1062.00. Through analysis of the existing bridge geometrics, structural inventory and appraisal, crash data, site visits, and discussion with the project team, the following were identified as the project needs:

- Address the structural deficiency of the existing bridge
- Determine if there are any other factors to consider that would require the increase in vertical clearance from 7 ft under the adjacent rail road bridge.

The purpose of this study is to improve safety, mobility and connectivity between the western part of Hickman County to the North portion of the City of Clinton.

Included in the alternates were a (#1) No Build recommendation, (#2) Build-In Place, (#3) Build with New Alignment and (#4) Give Bridge Away. After review of the data and discussion at the project team meeting, it was determined that Alternative #1 and #3 were not feasible and would not address the purpose and need for the project. Also, Alternative #4 was a highly unlikely alternative given current economic constraints on local governments, and would not alleviate KYTC involvement in order to still address the safety aspect of the Purpose and Need Statement. The estimate for Alternative #2-Build-In Place shows several different types of structure options and is within the funding listed in the currently Enacted Highway Plan (phase D) & Recommended Highway Plan (phases D, R, and U).

Planning Level Cost Estimate:

	Description	D (\$)(BRX)	R (\$)(BRX)	U (\$)(BRX)	C (\$)(BRX)	Total (\$mil)
1	No-Build	\$0	0	0	0	0
2	Build-in-Place	\$500,000	150,000	400,000	1,950,000	\$3,000,000
3	Build in New Alignment	N/A	N/A	N/A	N/A	N/A
4	Give existing Bridge & Adjacent Section of Road Away	N/A	N/A	N/A	N/A	N/A
-	Current Hwy Plan Estimated Cost	\$500,000	\$250,000	\$600,000	\$2,500,000	\$3,850,000
-	Current Pre-Con Estimated Cost	\$500,000	250,000	600,000	2,500,000	\$3,850,000

VI. Tables and Exhibits



Exhibit 1: Project Area Map

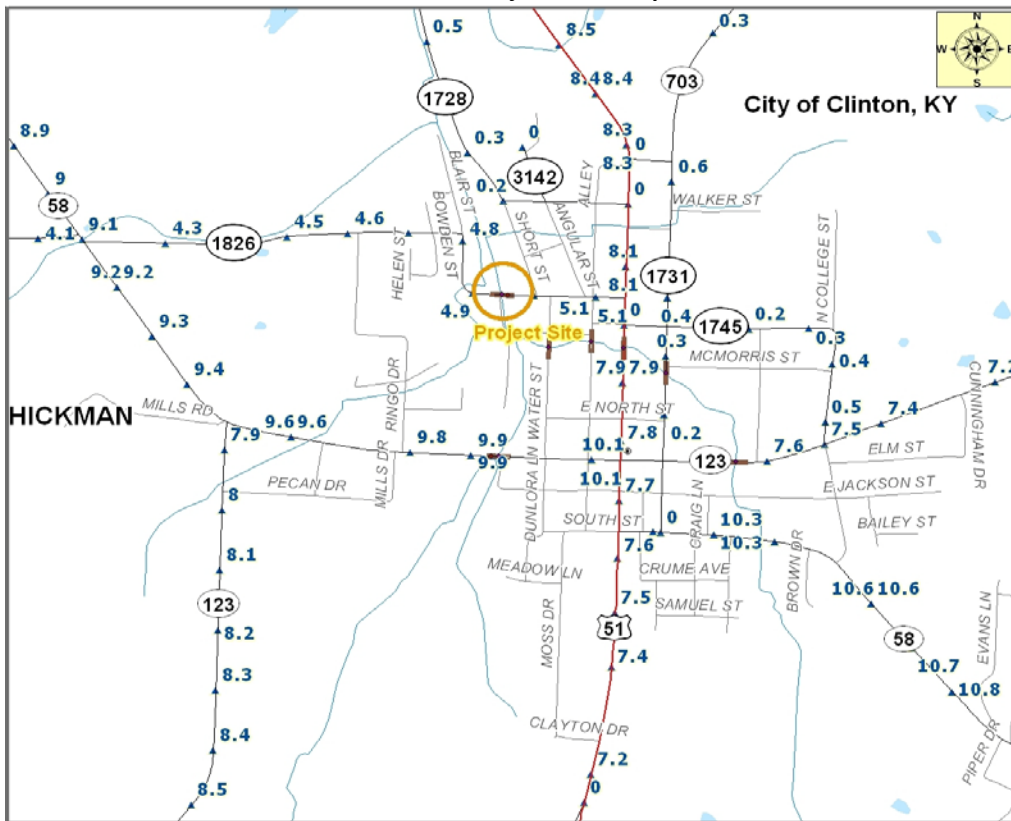


Exhibit 2: System Linkage

VI. Tables and Exhibits (cont.)

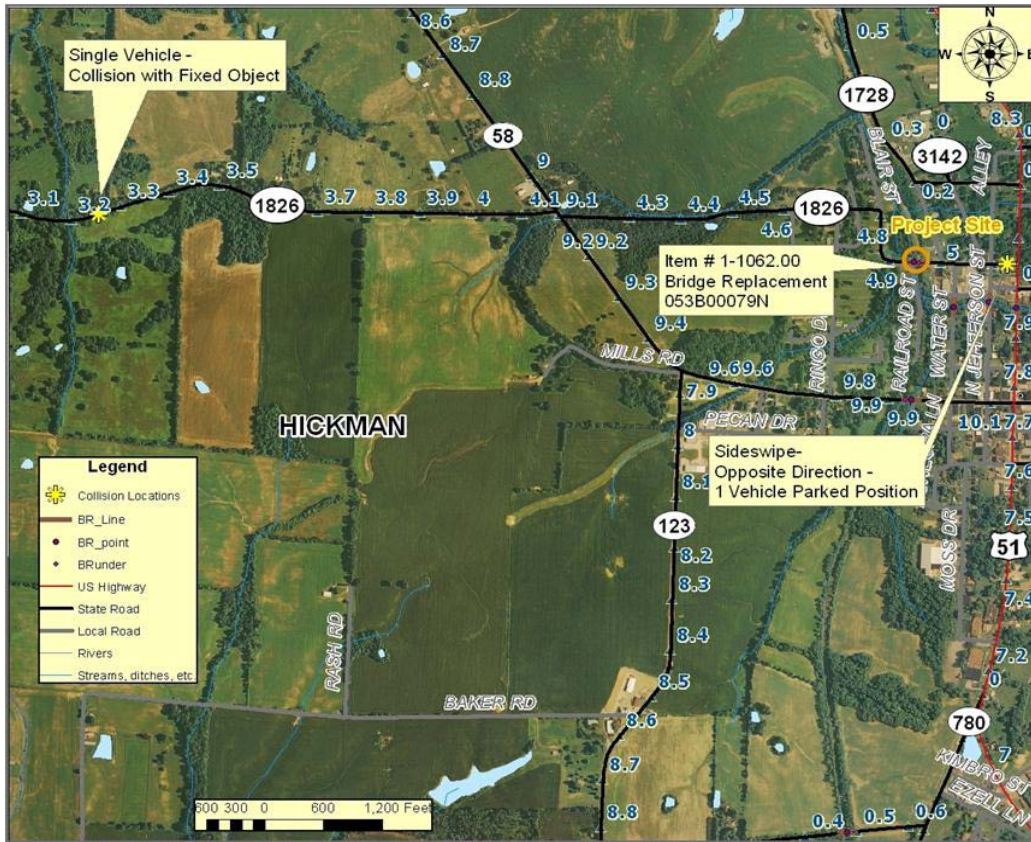


Exhibit 3: Collision Locations

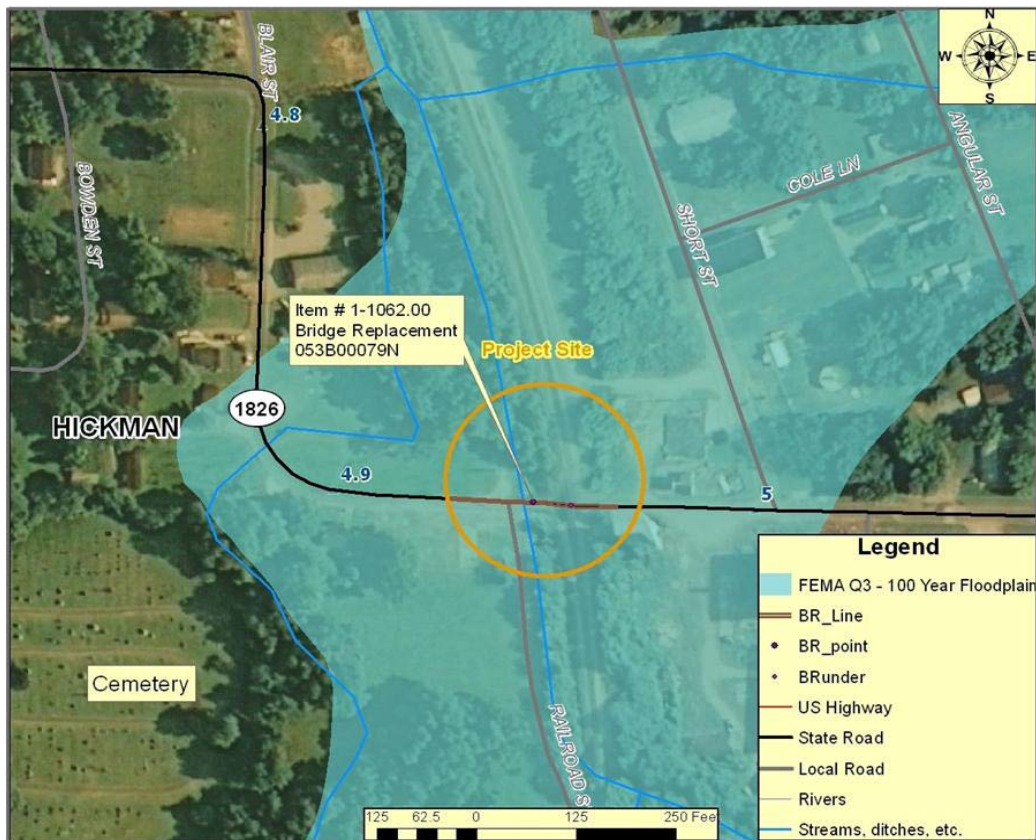


Exhibit 4: Preliminary Environmental Footprint

VI. Tables and Exhibits (cont.)

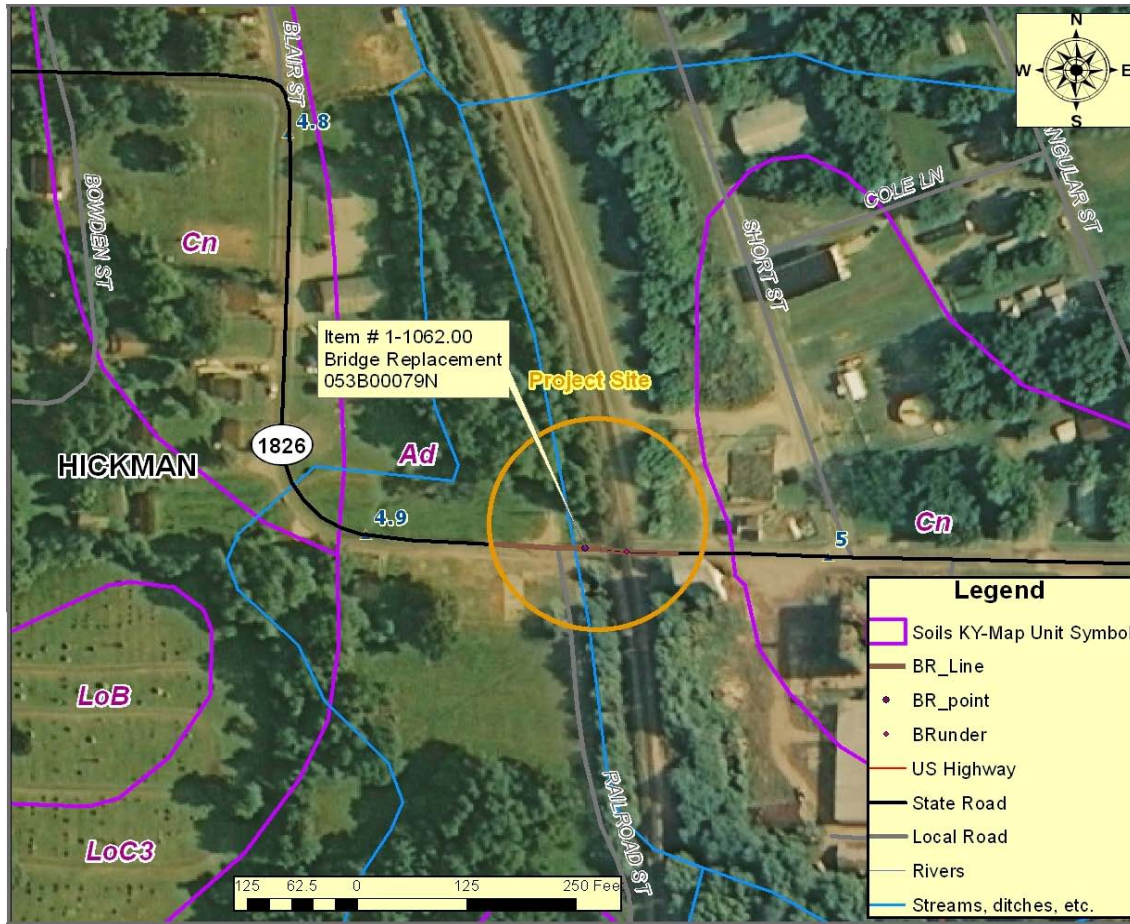


Exhibit 5: Soils Map

MUSYM	Map Unit Name
Ad	Adler Silt Loam, Frequently Flooded
Cn	Convent-Adler Silt Loams, Frequently Flooded
LoB	Loring Silt Loam, 2 to 6 Percent Slopes
LoC3	Loring Silt Loam, 6-12 Percent Slopes, Severely Eroded

Table 1: Soils Map Definitions

Helpful Links:

Links may include Project wise folder(s) containing supportive documentation, links to archived as-builts of the corridor, threatened/endangered species list for the county, FIRM maps, Bridge Rating Sheets, etc.

VI. Tables and Exhibits (cont.)



Exhibit 6: KY-1826 approaching Project Bridge looking east



Exhibit 7: KY-1826 approaching Pedestrian Bridge connected to Project Bridge looking east



Exhibit 8: KY-1826 continued approach to Railroad Bridge and Project Bridge looking west

VI. Tables and Exhibits (cont.)



Exhibit 9: KY-1826 gazing through Railroad bridge to Project Bridge looking west



Exhibit 10: KY-1826 Pedestrian Bridge looking south west from north east



Exhibit 11: KY-1826 looking south west onto Project Bridge

VI. Tables and Exhibits (cont.)



Exhibit 12: KY-1826 Project Bridge looking Upstream



Exhibit 13: KY-1826 Project Bridge looking Downstream



Exhibit 14: KY-1826 Project Bridge looking on Steel Beams