



2011

# Pre-Design Scoping Study

**D**ata  
**N**eeds  
**A**nalysis



KY 144, Daviess County  
Near Pleasant Valley Road  
Item No. 2-194.00

Prepared by the KYTC  
Division of Planning and  
KYTC District 2

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## I. INTRODUCTION

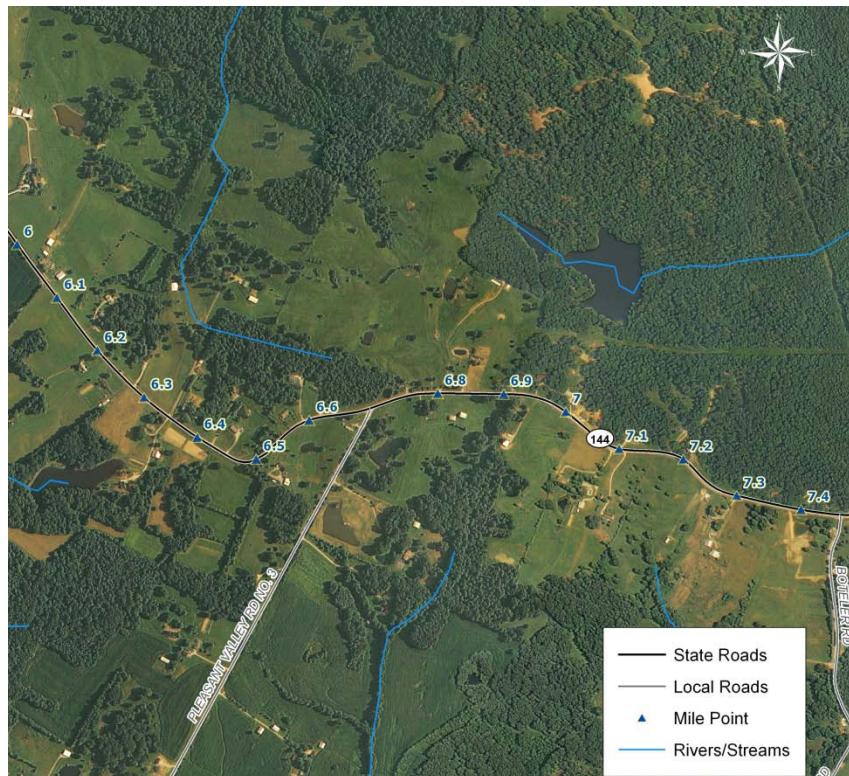
This study is a Data Needs Analysis (DNA) of a roadway project for the KY 144 corridor in Daviess County, Item Number 2-194.00.

### A. Study Purpose

The purpose of the 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, possible alternatives, planning-level cost estimates, an identification of potential environmental impacts, and other information that will be of assistance in future phases of the Project Development process of this project.

### B. Location

This project is located on KY 144 in Daviess County east of Owensboro. The project limits haven't been effectively established, but this study focuses primarily on KY 144 near the intersection with Pleasant Valley Road. See **Figure 1** and Exhibit 1 in **Appendix A**. A topographic map of the study area, Exhibit 2, 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 project as it is listed in the 2010 General Assembly's Enacted Highway Plan.

- **Item #2-194.00, Daviess County**

<u>Funding</u>	<u>Phase</u>	<u>Year</u>	<u>Amount</u>
SPP	C	2010	\$520,000
RECONSTRUCT KY 144 IN THE VICINITY OF PLEASANT VALLEY ROAD			
Milepoints: 6.6 to 6.7			
Purpose and Need: RELIABILITY/ MAJOR WIDENING			

Item #2-8631.00 is additional funding for the project. The following description is from the highway plan.

- **Item #2-8631.00, Daviess County**

<u>Funding</u>	<u>Phase</u>	<u>Year</u>	<u>Amount</u>
SB2	D	2012	\$660,000
REALIGN KY 144 TO KNOTTSVILLE			
Purpose and Need: RELIABILITY/ RECONSTRUCTION			

### B. Project Status

According to the Preconstruction Database, \$500,000 of SB2 Design funds have been authorized under Item #2-194.00. The funding from Item #2-8631.00 was moved to Item #2-194.00.

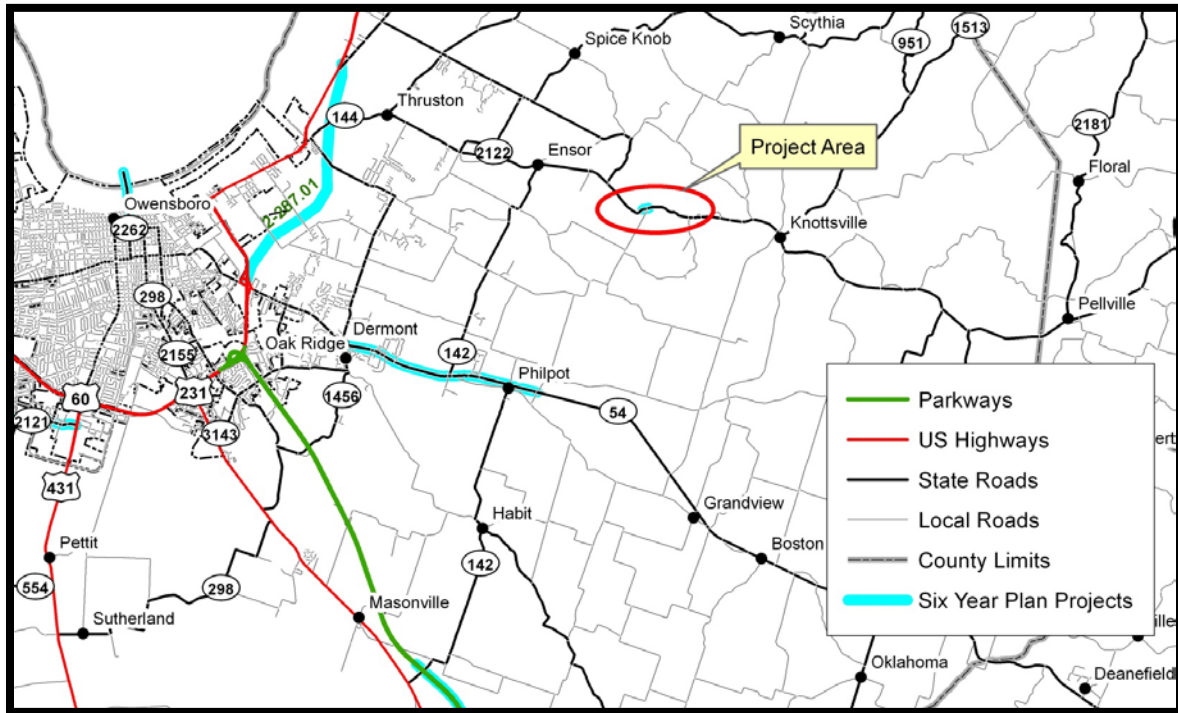
In 2005, JDQ produced a KY 144 Improvement Report for the Daviess County Fiscal Court. It proposed replacing eight curves with four 50 MPH horizontal curves with some straightening of the alignment. A copy from the report can be viewed in **Appendix B**. In the past, KY 144 was used regularly by coal trucks, and there was much local concern about the safety of school busses and other vehicles sharing the road with the coal trucks. More recently, the coal mine located off this route is open only intermittently, and the coal haul traffic may not be as much of an issue.

There is currently a project on the Unscheduled Projects List (UPL) that describes the project proposed in the KY 144 Improvement Report to address eight curves between MP 5.738 and MP 7.461. The Project Identification Form (PIF) for the project (#02 030 D0144 32.00) can be viewed in **Appendix C**. The Metropolitan Planning Organization (MPO) for Owensboro–Daviess County has not included this project in their FY 2011-2016 Transportation Improvement Plan (TIP).



### C. System Linkage

This segment of KY 144 connects the city of Owensboro to the community of Knottsville and other communities east of Owensboro (See **Figure 2** and Exhibit 3 in **Appendix A**).



**Figure 2: System Linkage Map**

KY 54 has the following roadway classifications:

- **Functional Classification – Rural Major Collector**
- **State System – State Secondary**
- **Truck Weight Classification – AA**
- **Coal Haul Route – Approximately 407,000 tons annually**
- **Access - By Permit**

### D. Modal Interrelationships

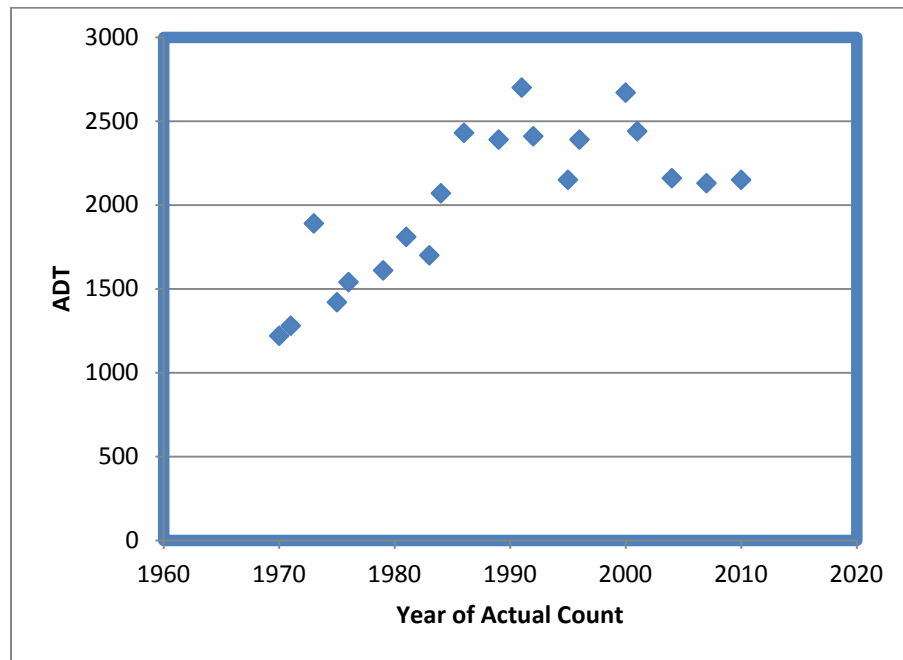
This is a coal haul route. There is an on-call service for public transit, GRITS.

### E. Social Demands & Economic Development

There are currently no plans for development along the route. It is used locally to access schools, hospitals, places of employment and retail areas.

## F. Transportation Demand

**Figure 3** below displays historic traffic counts for KY 144.



**Figure 3: Historic Traffic Counts on KY 144**

The last traffic count for this section of KY 144 was approximately 2,150. It can be seen in **Figure 3** that traffic has remained about the same in the past ten years. There was a slight drop in ADT in the late 1990's.

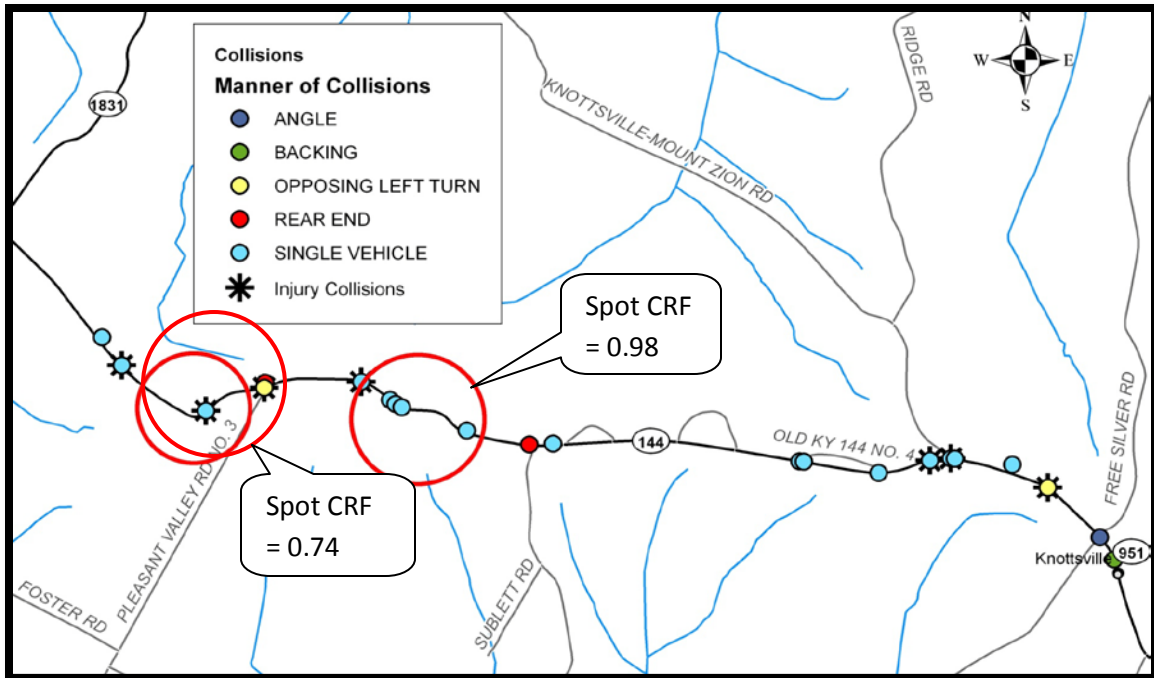
## G. Capacity

The current Volume/Service Flow, which is a measure of capacity, for this segment of KY 144 is 0.11. Capacity does not appear to be an issue at this time.

## H. Safety

Collision data was obtained from the Kentucky State Police database for a three year period from January 1, 2008 to December 31, 2010 for the project limits on KY 144. **Figure 4** displays the location of the collisions.

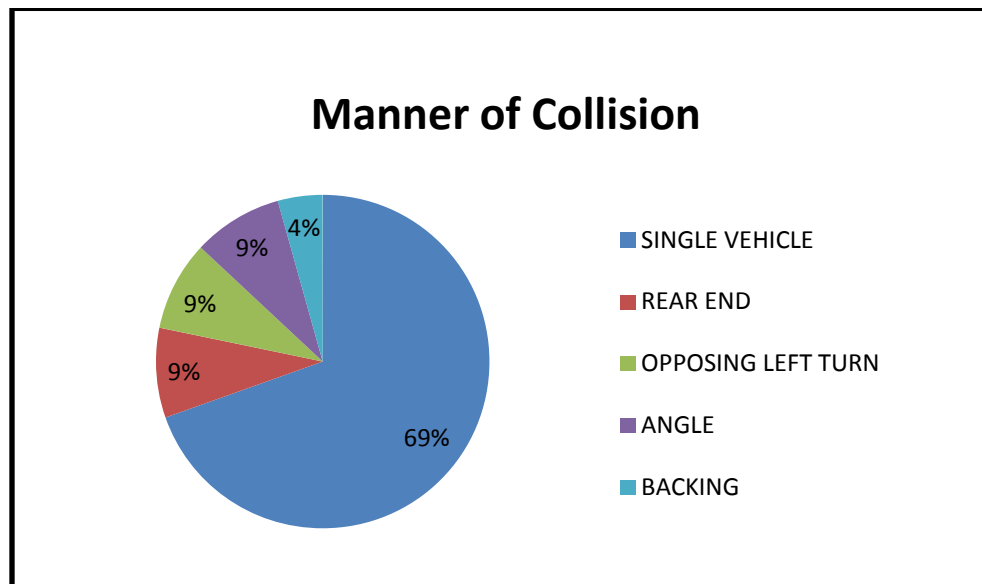




**Figure 4: Collision Locations**

The following is a summary of the collisions from MP 6.0 to MP 9.2:

- 0 fatalities
- 7 Injury collisions
- 23 Total collisions
- Segment CRF = 0.87



**Figure 5: Manner of Collisions**

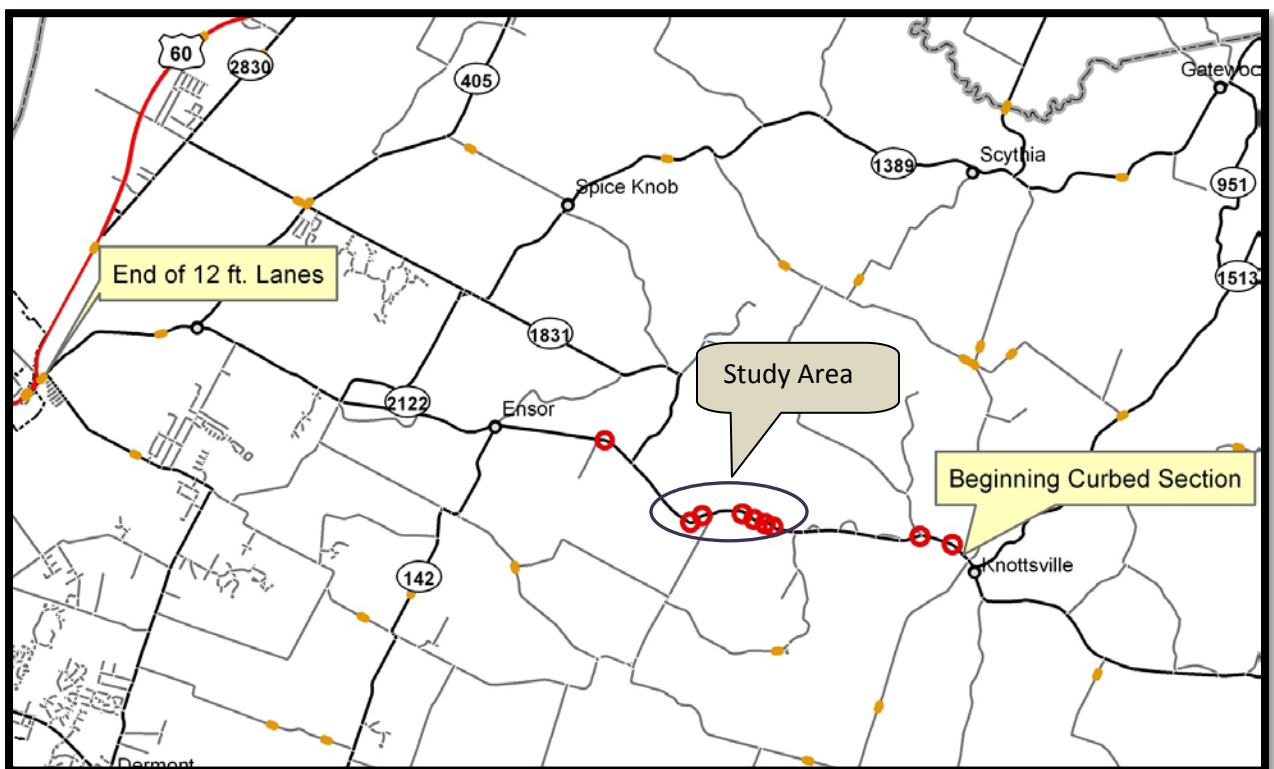
It should be noted that 6 of the 16 single vehicle collisions were with animals, and that several of the collisions occur in or while entering or exiting a curve.

The Critical Rate Factor (CRF) is the ratio of the actual crash rate on a segment of highway for a given time period as compared to the average crash rate of other similar roads in Kentucky. A CRF greater than 1.00 indicates the segment of roadway may have a statistically significant number of crashes. The segment CRF was 0.87. Two 0.3 mile spot CRF were also calculated in the area of the deficient curves. They can be viewed in **Figure 4** and were calculated to be 0.74 and 0.98. More detailed collision data can be viewed in **Appendix D**.

## I. Roadway Deficiencies

### a. Mainline Geometrics

This roadway currently has a rural template with 10-ft lanes and 2-ft shoulders. KYTC's Common Geometric Practices for Rural Collectors (see **Appendix E**) recommends 12-ft lanes with 8-ft shoulders. The existing alignment meets the minimum criteria for grade. There are several curves within the study area that do not meet the guidelines for horizontal curvature (see **Figure 6**).



**Figure 6: Deficient Horizontal Curves on KY 144**

Existing plans for this section of KY 144 were not readily available. A summary of existing conditions can be viewed in **Table 1**.

None of the sections appear to have significant drainage problems. FIRM maps of the area can be viewed in **Appendix F**.

Photos of KY 144 can be viewed in **Appendix G**.

b. Bridges

There are no bridges located within the project limits.

**Table 1: Existing Conditions and Data Summary**

County:	<u>Daviess</u>	Road Name:	<u>Knottsville Road</u>
Route Number(s):	<u>KY 144</u>		
Item No.:	<u>02-194.00</u>		
BMP:	<u>6.3</u>	EMP:	<u>7.33</u>
Segment Length:	<u>1.03 miles</u>		
Rdwy. Class.:	<u>Rural Major Collector</u>	State Class.:	<u>State</u> <u>Secondary</u>
Truck Class:	<u>AA</u>		
ADT (current):	<u>2,150</u>		
Terrain:	<u>Level</u>	Access Control:	<u>By Permit</u>
Posted Speed:	<u>55 MPH</u>	Median Type:	<u>Undivided</u>
Funding Type:	<u>Design-SB2</u>		

**Roadway Data:**

	<u>Existing Conditions</u>	<u>Recommended Design Guidelines</u>
No. of Lanes	2	Min. 2
Lane Width	10 ft	Min. 12 ft
Shoulder Width	2 ft	8 ft
Minimum Radius	<400 ft	960 ft*
Maximum Grade	<2.4 %	7%

*\* From AASHTO's Policy on Geometric Design of Highway and Street, Ex. 3-15, 55 MPH Design Speed, 8% eMax*

Adequacy Rtg %: 70.9 %

### III. PRELIMINARY ENVIRONMENTAL OVERVIEW

Currently this project is listed as being state funded, therefore not requiring an environmental document. No streams as defined by the U.S. Army Corps of Engineers were observed. If a permit is required then an environmental document will be necessary.

#### A. Air Quality

Daviess County is currently in attainment for all monitored air pollutants.

#### B. Archaeology

All additional right of way or permanent easement will require a Phase I archaeology survey.

#### C. Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) has identified the known and potential presence of threatened and endangered species in Daviess County (**Table 2**). During a site visit on February 17, 2011, potential habitat was observed for the bat species and several of the mussel species. A biological assessment should be completed prior to construction to assess the potential impact to threatened and endangered species.

**Table 2 – USFWS listing of Threatened and Endangered Species in Daviess County**

Group	Species	Common Name	Legal Status	Known Potential
Mammals	<i>Myotis sodalis</i>	Indiana bat	E	K
Mussels	<i>Plethobasus cooperianus</i>	orangefoot pimpleback	E	P
	<i>Plethobasus cyphus</i>	sheepnose	E	P
	<i>Pleurobema clava</i>	clubshell	E	P
	<i>Pleurobema plenum</i>	rough pigtoe	E	P
	<i>Potamilus capax</i>	fat pocketbook	E	P
	<i>Cyprogenia stegaria</i>	fanshell	E	P
	<i>Lampsilis abrupta</i>	pink mucket	E	P

**C. Hazardous Materials**

During the February 17, 2011 site visit no sources of potential hazardous materials were observed.

**E. Historic Resources**

There were several homes noted within the view shed of the project that were 50 years old or older. A thorough assessment of local residences would be required to gauge their eligibility for listing on the National Register of Historic Places. An example of the structures observed is noted below in **Figure 7**.



***Figure 7: Property Potentially Eligible for the National Register of Historic Places***

**F. Permitting**

Corps permitting is not expected to be an issue.

**G. Noise**

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

**H. Socioeconomic**

Socioeconomic impacts should not be an issue on this project.



**I. Section 4(f) Resources**

If either the archaeology sites or residences located nearby are ruled eligible for the National Register of Historic Places they could also be afforded protection under Section 4(f). KYTC has options to mitigate and avoid impacts to Section 4 (f) resources including a Programmatic Agreement for mitigating historic properties, using 'de minimus' guidance for minor strip takings.

**J. Section 6(f) Resources**

No potential Section 6(f) resources were observed on this potential project.

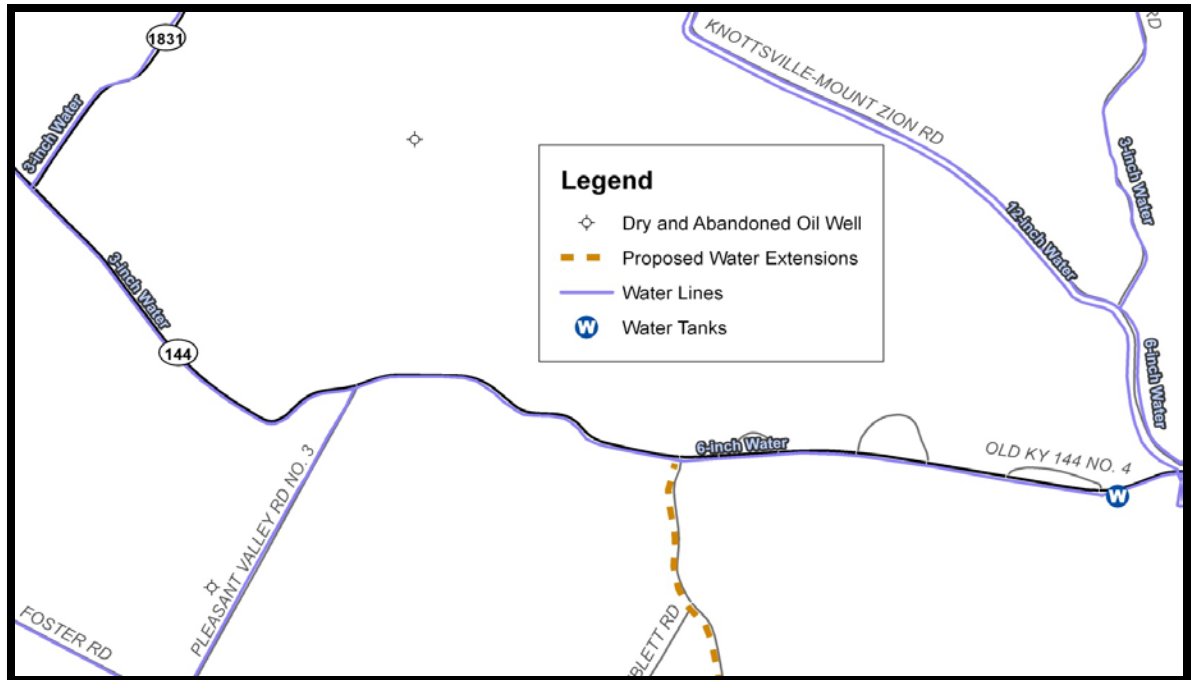
**IV. PRELIMINARY PROJECT INFORMATION**

**A. Utilities**

A summary of possible utility contacts in the project area is below.

Kenergy JR Robey 270-689-6100	East Daviess County Water Frankie Fulkerson 270-281-5187
AT&T Larry Crabtree 270-685-7609	Time Warner Cable Brent Rafferty 270-222-0861

A preliminary sketch of the approximate location of some of the utilities in the project area can be viewed in **Figure 8**. This information was obtained from a GIS database. The location of utilities will need to be verified as the project survey is completed in Phase I Design.



**Figure 8 : Utility Locations**

## **B. Agency Coordination**

The Project Team met on April 18, 2011 to review and discuss the project and the DNA. Existing conditions information was discussed. Some alternatives were also discussed. The minutes of this meeting can be reviewed in **Appendix H**.

## **V. PROJECT PURPOSE AND NEED STATEMENT**

A Purpose and Need Statement is the foundation for project decision-making and is needed for projects requiring NEPA documentation. 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 this project:

KY 144 has several horizontal curves that do not meet recommended guidelines for rural collectors. The lane and shoulder widths of KY 144 also do not meet the recommended guidelines for rural collectors. There are collisions occurring in the proximity of the deficient horizontal curves. **The purpose of this study on KY 144 is to address the geometric deficiencies and to improve the safety and connectivity between Owensboro and Knottsville.**

## VI. POSSIBLE ALTERNATIVES

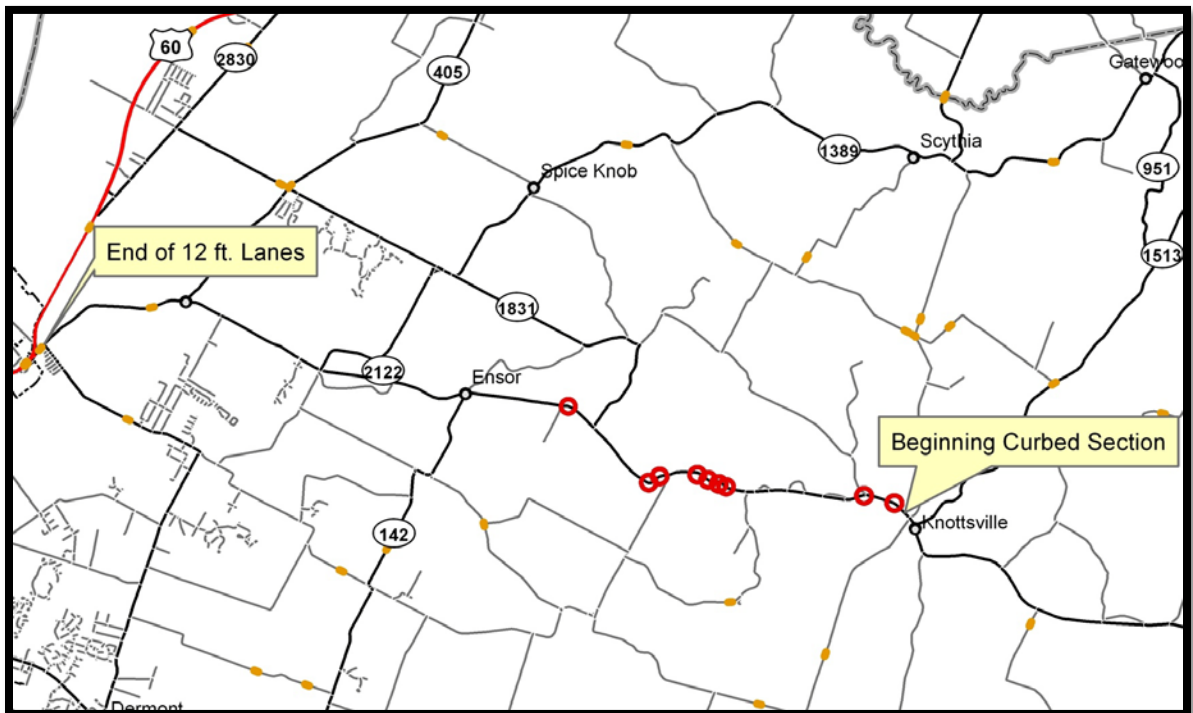
The following are possible alternatives analyzed and discussed during the development of this study.

### A. Alternative #1 - No Build

This alternative does not adequately address the purpose and need of the project.

### B. Alternative #2 – Reconstruct KY 144

This alternative would widen KY 144 from 10 ft lanes to 12 ft lanes and from 2 ft shoulders to 8 ft shoulders. This would also require the improvements of 9 horizontal curves (see red circles in **Figure 9** below) from MP 0.95 to MP 8.863 (7.913 miles).



**Figure 9: Alternative #2**

Alternative #2 would result in the most impact to right-of-way and utilities. The project team also noted the cost of this alternative, roughly estimated to be over \$10 million, is significantly more than the funding allocated in the highway plan.

### C. Alternative #3 – Improve Curves Near Pleasant Valley Road

This alternative addresses 6 of the 9 substandard curves identified in **Figure 9** by reconstructing and partially realigning approximately 1 mile of roadway. The proposed curve improvements would occur between MP 6.3 and MP 7.4 near Pleasant Valley Road (see **Figure 10**). Some preliminary design has been done on these curves and can be viewed in **Appendix I**. The alignment of the preliminary design is subject to change during future phases of project development.



**Figure 10: Alternative #3**

The following is the preliminary cost estimated for Alternative #3:

<u>Phase</u>	<u>Estimate</u>
Design	\$400,000
Right of Way	\$750,000
Utilities	\$500,000
Construction	<u>\$1,000,000</u>
<b>Total</b>	<b>\$2,650,000</b>

It should be noted that in the past there was discussion of the local government helping with the acquirement of right of way. If this occurs, the cost estimate for this alternative will change.

## **VII. SUMMARY**

This study is a Data Needs Analysis (DNA) of a roadway project for the KY 144 corridor in Daviess County, Item Number 2-194.00. Through analysis of the existing roadway geometrics, crash data, site visits, and discussion with the project team, needs were identified within the project limits. The following were identified as project needs:

- KY 144 has several horizontal curves that do not meet recommended guidelines for rural collectors.
- There are collisions occurring in the proximity of these horizontal curves.
- The lane and shoulder width of KY 144 do not meet the recommended guidelines for rural collectors.

The purpose of this study on KY 144 is to address the geometric deficiencies and to improve the safety and connectivity between Owensboro and Knottsville.

Included in the alternatives were a no build recommendation, an alternative to widen almost 8 miles of the corridor and bring it up to the recommended geometric guidelines, and an alternative to improve approximately 1 mile of the roadway near Pleasant Valley Road which would address most of the deficient horizontal curves along the corridor.

Currently, the funding appropriated for the project is \$1,180,000 if funding for Item #2-8631.00 and Item #2-194.00 are combined. The preliminary cost estimate for Alternate #2 is well over \$10 million, and the preliminary cost estimate for all phases of Alternative #3 is \$2,650,000. Funding for additional phases will need to be allocated in the highway plan to further this project.