

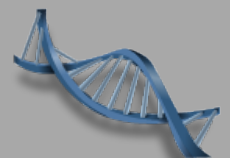
Programming Study



KY 38, Harlan County
From west of KY 3457 to
east of KY 179

Prepared by the KYTC
Division of Planning and
KYTC District 11

September 2013



Executive Summary

The KY 38 programming study was undertaken as a result of requests from Congressman Hal Rogers and several local officials to identify improvements along the rural collector in Harlan County, east of the city of Harlan. The study area extends from just west of KY 3457 (MP 7.500), to just east of the KY 179 intersection (MP 17.000) (see **Figure ES-1**). A project team was assembled and included participants from the Kentucky Transportation Cabinet's (KYTC) Central Office Planning and Geotechnical Branches, the KYTC District 11 Manchester office's Project Development Branch (Highway Design and Environmental Analysis), District 11 Project Development & Preservation Branch, and the Cumberland Valley Area Development District. No local officials/stakeholders meetings or public meetings were held as a part of this study. Through analysis of the existing roadway geometrics, crash data, site visits, and discussion with the project team, several needs were identified:

- KY 38, east of Evarts, has a narrow roadway template with several horizontal curves that do not meet current design standards.
- There is a collision history at many of the horizontal curve locations causing the CRF to be greater than 1, therefore crashes may not be occurring at random.
- KY 38 connects the community of Evarts and many other communities along the route to the city of Harlan to the west and the state of Virginia to the east.

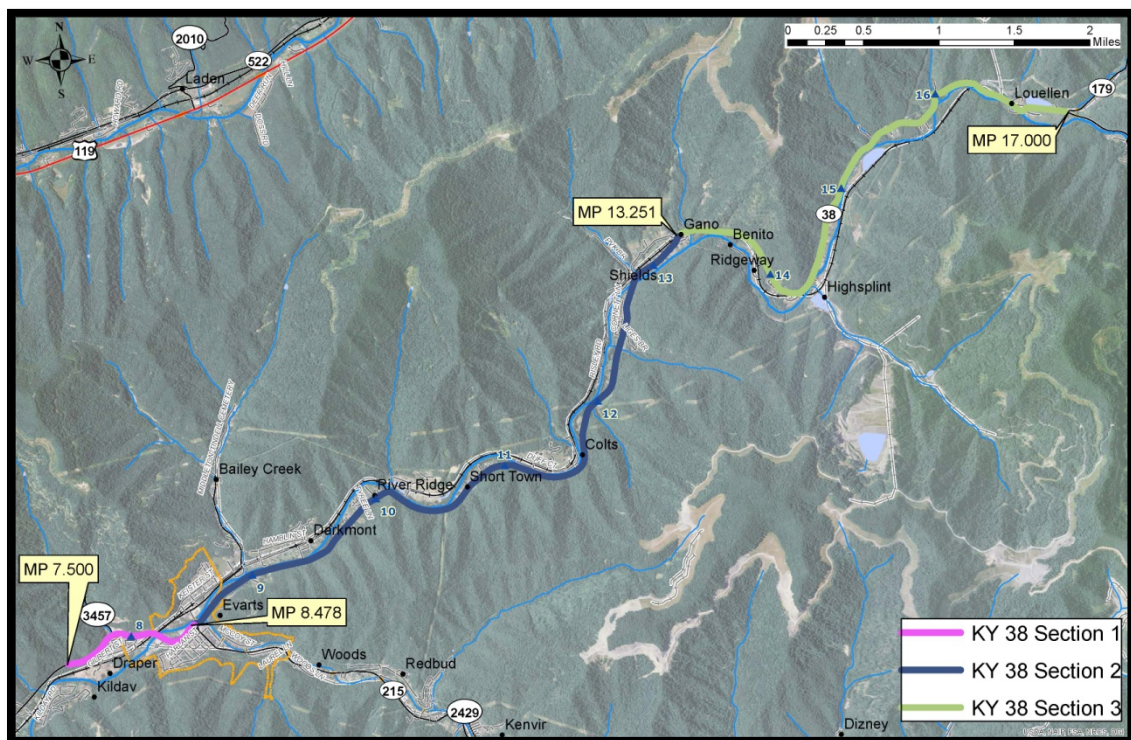


Figure ES-1: Project Location Map

The purpose of this study is to identify potential spot locations along the KY 38 corridor to improve the safety, mobility, and connectivity between Evarts and Louellen. Suggested spot improvements include combining access points, adding advanced warning signage, clearing trees to aid with sight distance, realigning horizontal curve(s), minor widening of the shoulder(s), reconstructing the alignment, replacing a bridge, constructing an auxiliary lane(s), and resurfacing driving lanes with high friction asphalt.

One of the fourteen spot improvements identified by the project team is in the current 2012 Highway Plan, and the description along with the funding information follows:

- **Item No. 11-8704.00, Harlan County**

<u>Funding</u>	<u>Phase</u>	<u>Year</u>	<u>Amount</u>
SPP	D	2013	\$550,000
SPP	R	2013	\$200,000
SPP	U	2013	\$150,000
SPP	C	2014	\$1,200,000
IMPROVE SAFETY ON DEAD MAN'S CURVE NEAR MP 10.1. (12CCN)			
Purpose and Need: SAFETY/SAFETY (P)			

A comprehensive listing of all potential spot improvements identified on KY 38, the brief problem, and their associated cost for the various phases is shown below in **Table ES-1**.

Milepoint (approx.)	Issue	Cost Estimate (\$)				
		Design	Right of Way	Utility	Construction	Total
7.800 - 7.950	access management, speeding	\$15,000	-	-	\$50,000	\$65,000
8.100 - 8.500	access management, railroad crossing	\$15,000	-	-	\$50,000	\$65,000
8.400 - 8.600	sight distance, horizontal curve	\$100,000	\$50,000	\$50,000	\$750,000	\$950,000
9.300 - 9.550	minimal shoulder, approach roads	-	-	-	\$100,000	\$100,000
10.050 - 10.150	sight distance, horizontal curve	\$550,000	\$200,000	\$150,000	\$1,200,000	\$2,100,000
10.800 - 11.100	rock slides, adjacent river	\$750,000	\$750,000	\$500,000	\$4,500,000	\$6,500,000
11.450 - 11.550	sight distance, horizontal curve	-	-	\$50,000	\$200,000	\$250,000
11.850 - 12.050	sight distance, lack of shoulders	-	-	\$50,000	\$250,000	\$300,000
12.800 - 12.950	deficient bridge, narrow approaches	\$350,000	\$150,000	\$100,000	\$1,800,000	\$2,400,000
13.200 - 13.400	horizontal curve at railroad	\$150,000	\$50,000	\$100,000	\$900,000	\$1,200,000
14.200 - 14.450	narrow section for turn movements	\$150,000	\$100,000	\$100,000	\$1,500,000	\$1,850,000
15.350 - 15.750	lack of shoulders	-	-	-	\$250,000	\$250,000
15.900 - 16.100	horizontal S-curve	\$300,000	\$150,000	\$75,000	\$1,000,000	\$1,525,000
16.550 - 16.800	horizontal curve	\$300,000	\$300,000	\$75,000	\$1,000,000	\$1,675,000

Table ES-1: Cost Estimates of 14 Spot Improvements

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I. INTRODUCTION

This is a programming study that includes numerous potential spot improvements along a nearly ten mile portion of the KY 38 corridor in Harlan County.

A. Study Purpose

The purpose of the study is to provide a more defined project scope, possible spot improvements, planning-level cost estimates, an identification of potential environmental impacts, and other information that will be of assistance for further development of this project.

B. Location

The study area is located on KY 38 in Harlan County east of the city of Harlan. The project limits extend from just west of KY 3457 (MP 7.500), to just east of the KY 179 intersection (MP 17.000). For the purposes of this study, it is divided into three sections. 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**.

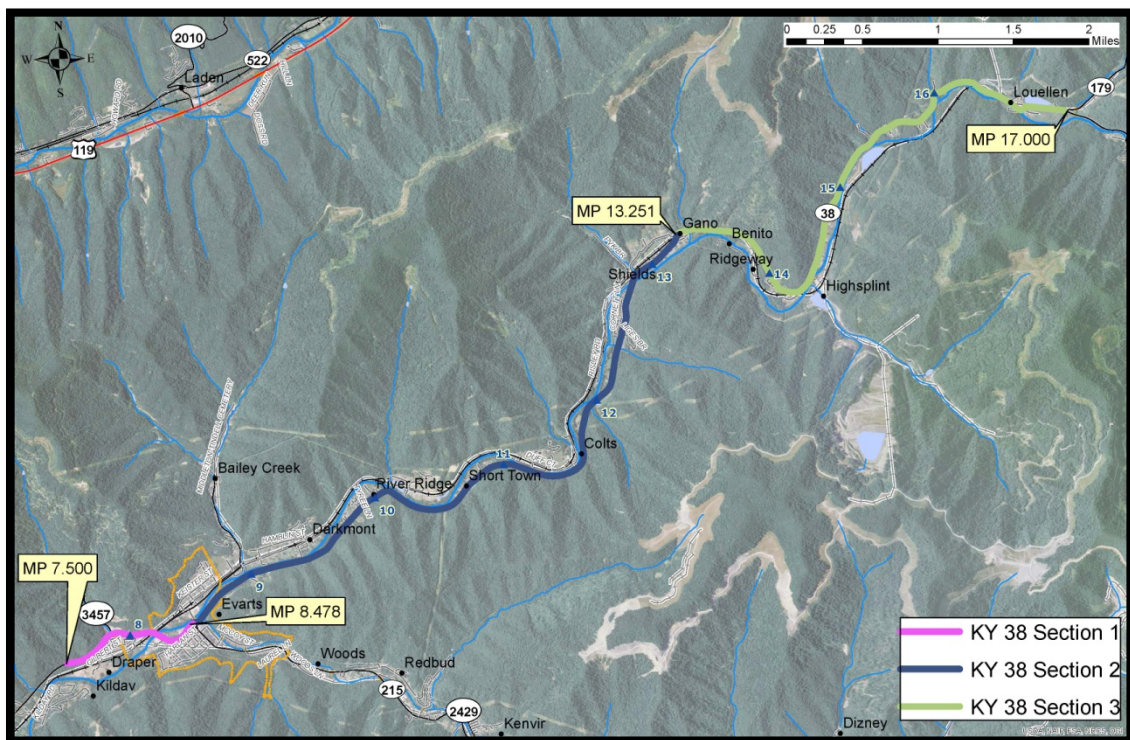


Figure 1: Project Location Map

II. PROJECT PURPOSE AND NEED

A. Legislation

At this time, there is minimal funding for this section of KY 38 in the 2012 General Assembly's Enacted Highway Plan. One of the fourteen suggested spot improvements from this study (Project 5 – MP 10.1) is in the current Highway Plan. The following is a description of the project:

- **Item No. 11-8704.00, Harlan County**

<u>Funding</u>	<u>Phase</u>	<u>Year</u>	<u>Amount</u>
SPP	D	2013	\$550,000
SPP	R	2013	\$200,000
SPP	U	2013	\$150,000
SPP	C	2014	\$1,200,000

IMPROVE SAFETY ON DEAD MAN'S CURVE NEAR MP 10.1. (12CCN)

Purpose and Need: SAFETY/SAFETY (P)

This programming study was requested by several local officials, along with Congressman Hal Rogers after receiving numerous letters from the public requesting support for funding along the corridor.

B. Project Status

The primary goal of this study is to identify additional spot improvements at potential locations that could possibly be programmed into a future 6 Year Highway Plan.

There is currently a project on the Unscheduled Projects List (UPL) to address the horizontal alignment, safety, and congestion on KY 38 from KY 215 to Benito. This encompasses all of Section 2 and the first half mile of Section 3. The Project Identification Form (PIF) for the project (#11 048 D0038 27.00) can be viewed in **Appendix B**. According to the PIF, the regional goals of this project are to develop and maintain existing primary systems that provide connections between cities and counties, focus on building and improving the arterial and collector roads that support them, improve highway safety at identified locations and corridors, and expand and improve roadways with congestion issues along KY 38.

C. System Linkage

KY 38 connects the city of Harlan to the city of Evarts and other communities east of Evarts before continuing into the state of Virginia. This particular segment of KY 38 begins at the western city limits of Evarts and connects to KY 179, just past the community of Louellen (See **Figure 2** and Exhibit 3 in **Appendix A**).

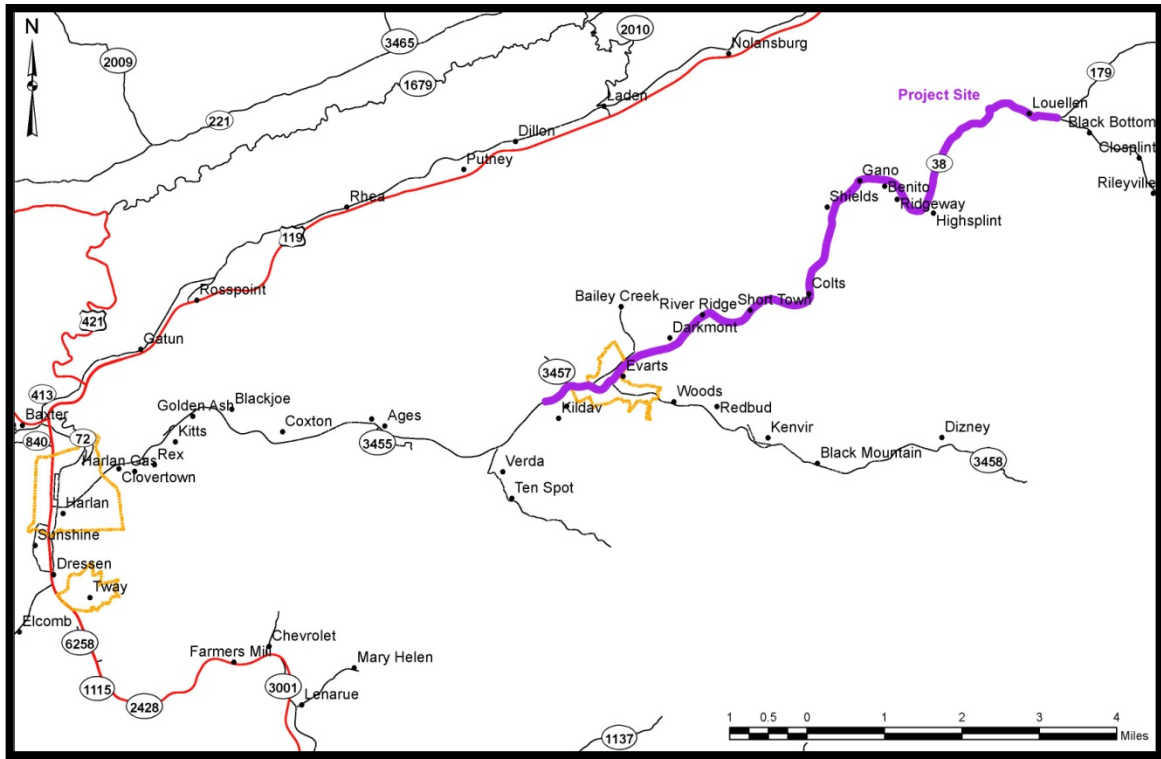


Figure 2: System Linkage Map

KY 38 has the following roadway classifications:

Functional Classification	Rural Major Collector
State System	State Secondary
National Truck Network	No
Truck Weight Class	AAA
Type of Access	By Permit

D. Modal Interrelationships

All of Section 1, Section 2, and the first mile of Section 3 are a part of the Coal Haul Highway System. Additionally, city streets in Evarts allow All-Terrain Vehicle (ATV) travel so visitors to Black Mountain and the R.V. Park and Campgrounds can access services and supplies. The latter half of Section 1 and the beginning of Section 2 are within the city limits of Evarts. Refer to Figure 1 for KY 38 section locations.

E. Social Demands & Economic Development

As with most counties in eastern Kentucky, Harlan County and the city of Evarts have been losing population for half a century. Efforts have been made to increase recreational opportunities in the area in order to attract visitors. There are two R.V. Park and Campgrounds in Evarts accessible via this route, as well as the Evarts Trailhead which provides access to the Black Mountain Off-Road Adventure Area. This ATV and Off-Highway Vehicle trail system offers over 200 miles of 4x4 and ATV trails and receives an estimated 20,000 – 30,000 visitors each year. This has led Evarts to be called the *Birthplace of Adventure Tourism*.

F. Transportation Demand

KY 38 within the project limits contains three different traffic counting sections. The first is Section 1 from MP 4.755 to MP 8.478. The second is Section 2 from MP 8.478 to MP 13.251. The third and last traffic counting section is Section 3 from MP 13.251 to MP 17.002. **Figure 3** below displays historic traffic counts for each of these sections.

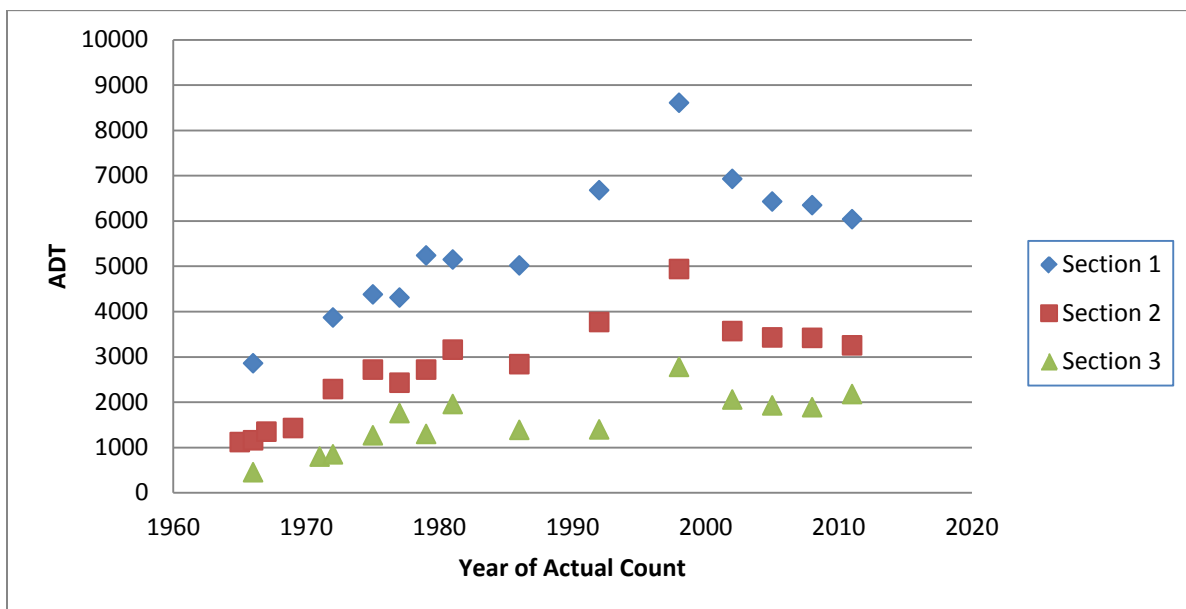


Figure 3: Historic Traffic Counts on KY 38

The last actual traffic counts for these sections are:

- Section 1 – 6,040 in 2011
- Section 2 – 3,255 in 2011
- Section 3 – 2,180 in 2011

It can be seen in **Figure 3** that traffic has declined in the past few years for all the sections except Section 3 which experienced a slight increase over the last traffic count.

One public county-wide high school, Harlan County High School, opened in 2008 to replace three separate high schools throughout the county, including Evarts High School. The new high school is located on US 119, west of the beginning of the project limits. This could be the cause for the decrease in ADT for Sections 1 and 2.

G. Capacity

There is not much congestion throughout the corridor. But, all three sections have a roadway template of two driving lanes with no passing lanes. Additionally, because of the curves in the horizontal alignment, there are sight distance issues so the entire corridor is a no-passing zone. Therefore during peak hours there is a greater chance of vehicles traveling in platoons. Section 1 is a Class III two-lane highway, because of the presence of local traffic and increased access points. According to Highway Capacity Software analysis, in the two segments in this section, vehicles travel at 82.2% and 75.6% of the free-flow speed. Section 2 and Section 3 are classified as Class I two-lane highways, indicating daily commuter routes. The Percent Time Spent Following (PTSF) is 61.6% and 56.2% in Section 2 and Section 3, respectively.

H. Safety

Collision data was obtained from the Kentucky State Police database for a three year period from May 1, 2008 to April 30, 2011 for the project limits on KY 38. **Figure 4** on the following page displays the location of the collisions along Section 1 and their manner of collision.

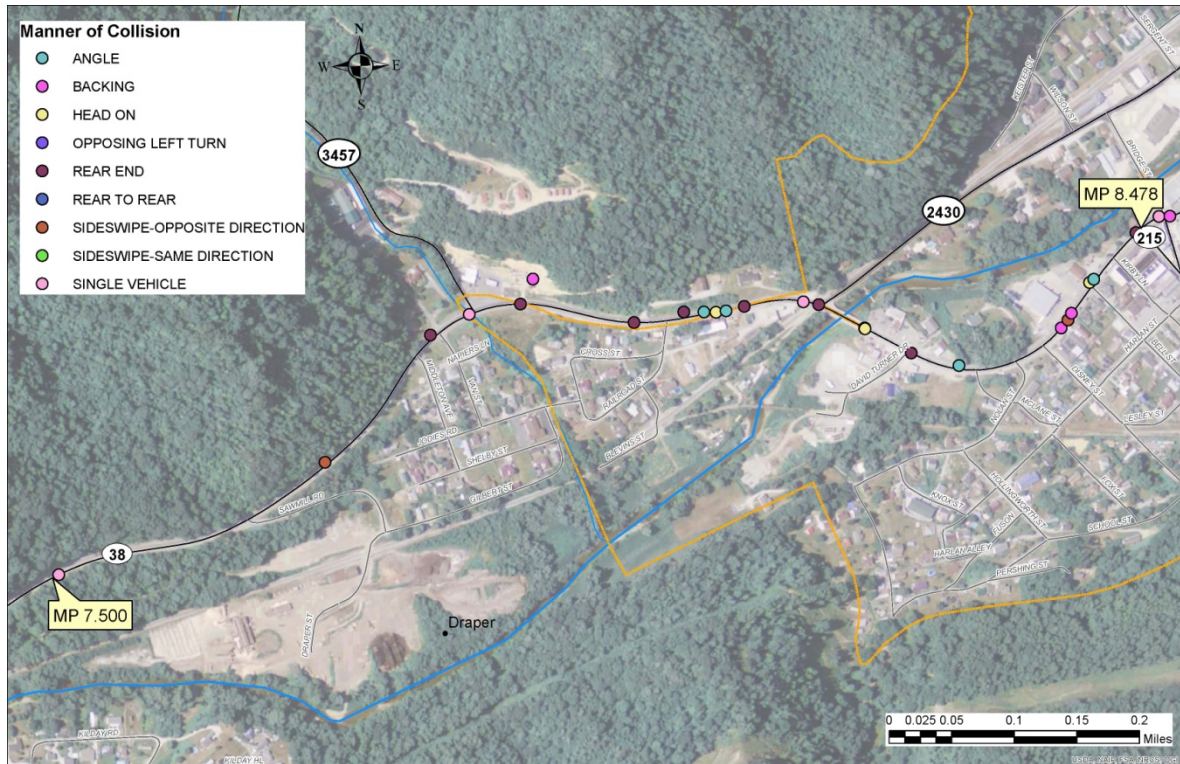


Figure 4: Collision Locations, Section 1

The following is a summary of the collisions for Section 1 of the study area during the analysis period:

- 0 fatalities
- 5 Injury collisions
- 24 Total collisions
- Section 1 CRF = 0.92

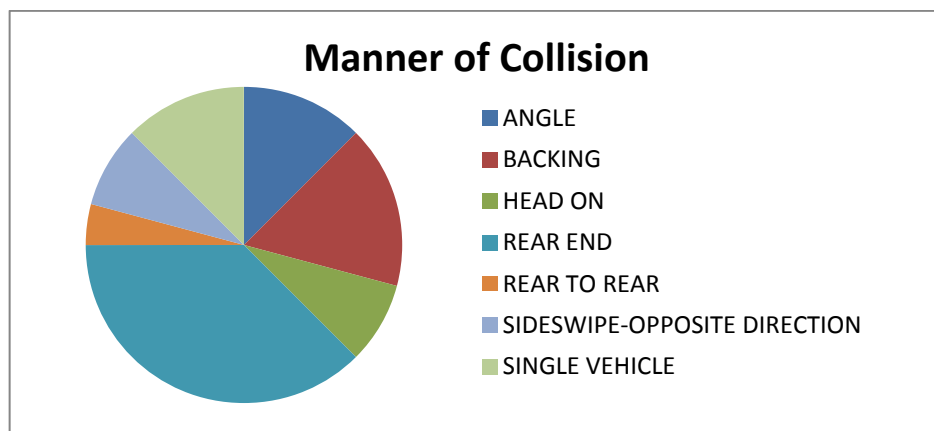


Figure 5: Manner of Collisions, Section 1

Over one-third of the reported collisions were rear ends, and another one-sixth were classified as backing type collisions. This section is only 0.978 mile in length, has the most access points per mile, and is the most congested. No night/day or weather pattern for cause of crashes could be determined. Section 1 lies at the western end of the project near the community of Evarts.

Figure 6 displays the location of the collisions along Section 2 and their manner.

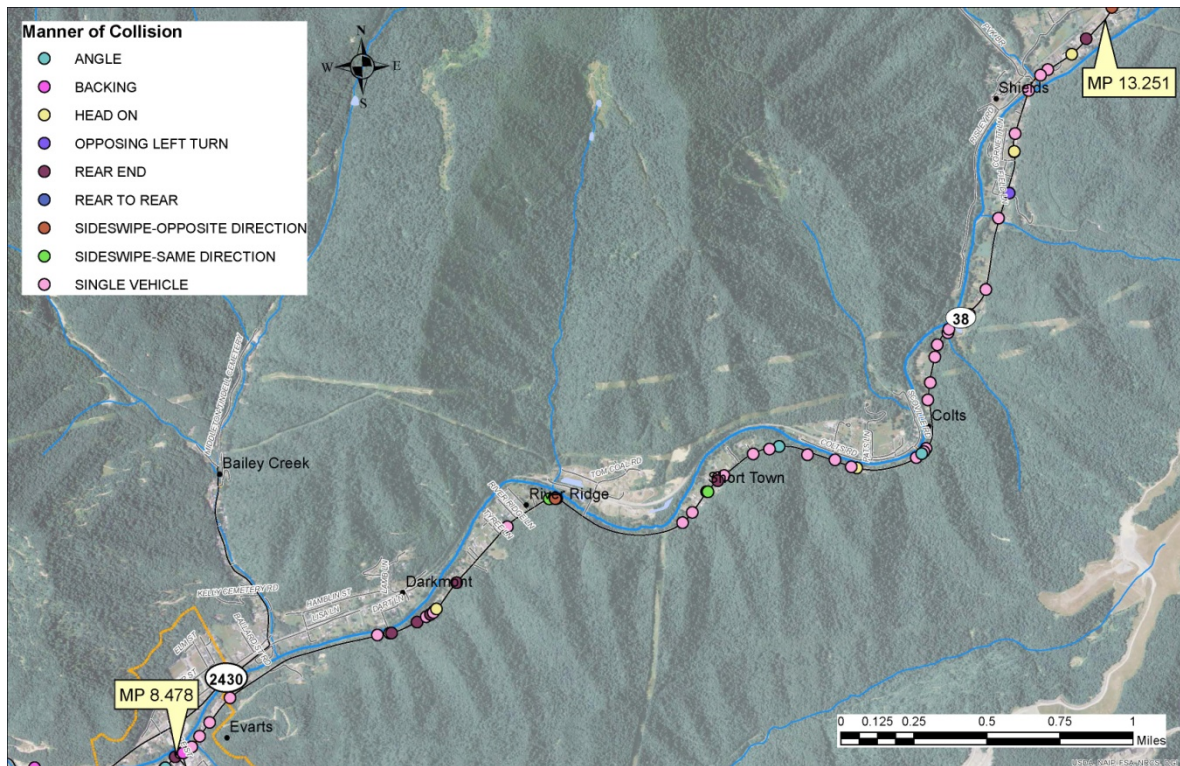


Figure 6: Collision Locations, Section 2

The following is a summary of the collisions for Section 2 during the analysis period:

- 0 fatalities
- 21 Injury collisions
- 60 Total collisions
- Section 2 CRF = 1.03

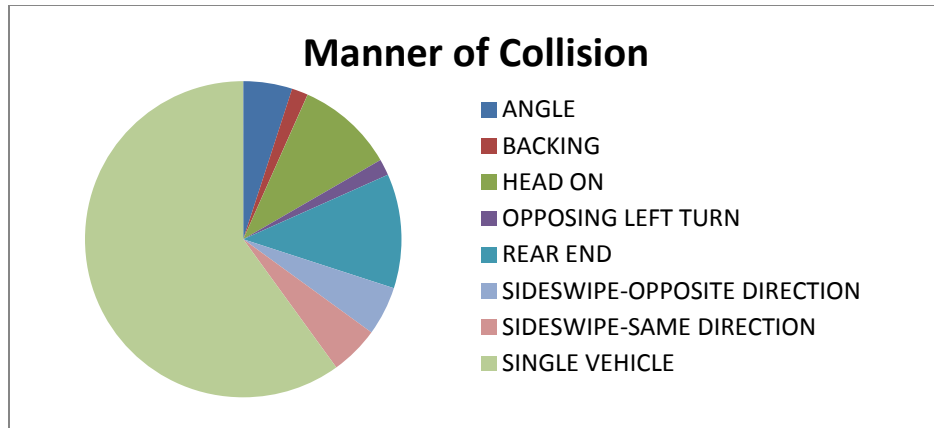


Figure 7: Manner of Collisions, Section 2

Sixty percent of the collisions in Section 2 were single vehicle crashes, the majority of those coming in the numerous horizontal curves throughout the corridor. Additionally over half of the collisions occurred in wet or icy conditions, and nearly half were either at night, dusk, or dawn.

Figure 8 displays the location of the collisions along Section 3 and their manner.

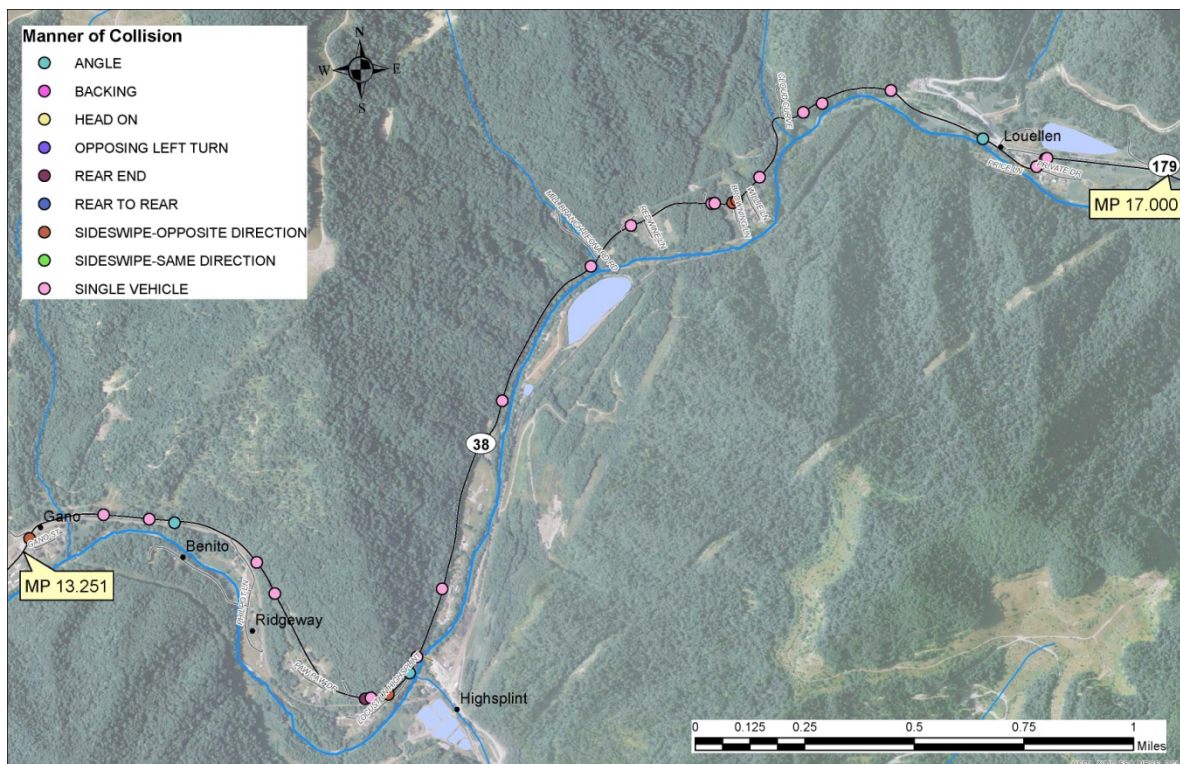


Figure 8: Collision Locations, Section 3

The following is a summary of the collisions for Section 3 during the analysis period:

- 1 fatality
- 8 Injury collisions
- 28 Total collisions
- Section 3 CRF = 0.96

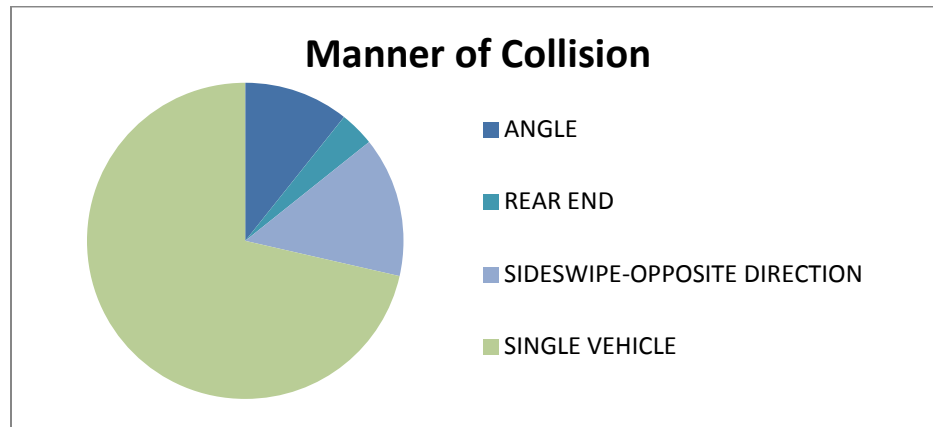


Figure 9: Manner of Collisions, Section 3

Nearly 75% of the collisions in Section 3 were single vehicle crashes, and once again many of those came along horizontal curves. Also, as with the previous section, nearly half were either at night, dusk, or dawn.

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. Section 2 has a CRF slightly higher than 1.00, while the CRF for Sections 1 and 3 are slightly lower than 1.00. More detailed collision data can be viewed in **Appendix C**.

I. Roadway Deficiencies

a. Mainline Geometrics

Each section was originally constructed in the 1940's. All three sections are classified as Rural Major Collectors. Section 1 has several access points, was reconstructed in the 1980's, has a rural template, and is listed as having 11-ft lanes and 2-ft shoulders. Sections 2 and 3 have few access points with rural templates, and are listed with 10-ft lanes and 4-ft shoulders. However, shoulder drop-offs are evident in segments of Sections 2 and 3 and guardrail is present along much of the corridor to protect vehicles from steep drop-offs. The intersections are non-signalized throughout the entire corridor, with stop signage at each side street. KYTC's Common Geometric Practices for Rural Collector Roads (see Appendix D)

recommends 12-ft lanes with 8-ft shoulders for traffic volumes of over 2000 ADT. In addition, there are numerous locations in tight horizontal curves that have warning signs for lower speeds posted. These locations are not reflected in the summary of existing conditions, which can be viewed in **Table 1** for Section 1 and **Table 2** for Sections 2 and 3.

The Clover Fork of the Cumberland River runs alongside all sections of KY 38, and drainage problems or possible flooding issues are present. FIRM maps of the area can be viewed in **Appendix E**.

Pictures for each section can be viewed in **Appendix F**. The plan sheets for the existing roadway can be viewed in **Appendix G**.

b. Bridges

There are four bridges located within the project limits, Bridge #048B00086N over the Clover Fork of the Cumberland River, Bridge #048B00158N over Yocum Creek, Bridge #048B00012N over the Clover Fork of the Cumberland River, and Bridge #048B00013N over Liges Branch. The first bridge (#048B00086N) over the Clover Fork of the Cumberland River has a Sufficiency Rating of 76.70 and is not Structurally Deficient. The second bridge (#048B00158N) over Yocum Creek is Functionally Obsolete with a Sufficiency Rating of 63.50 due to minor cracks on the concrete bridge deck, columns, and railing. The third bridge (#048B00012N) over the Clover Fork of the Cumberland River is Structurally Deficient with a Sufficiency Rating of 49.80 due to cracking throughout all portions of the bridge. The fourth structure (#048B00013N) over Liges Branch is also Structurally Deficient with a Sufficiency Rating of 31.50. Parts of the structure are not supported, there are numerous cracks, clogging issues are present within the culvert, and a w-rail is needed. The first bridge has a roadway width of 33.5-ft. and could potentially handle another lane of traffic, but an at-grade railroad crossing is present directly west of the bridge. The next two bridges are currently only wide enough to provide two lanes of traffic with roadway widths of 24.0-ft and 20.0-ft. The final structure has a width of 44.0-ft. but the roadway pavement width is 20.0-ft. Additional information can be viewed in the Structure Inventory and Appraisal Sheets located in **Appendix H** and in **Table 2**.

Table 1: Existing Conditions and Data Summary – Section 1

County:	<u>Harlan</u>	Road Name:	<u>Highway 38</u>
Route Number(s):	<u>KY 38</u>		
Item No.:	<u>N/A</u>		
BMP:	<u>7.500</u>	EMP:	<u>8.478</u>
Segment Length:	<u>0.978 miles</u>		
Rdwy. Class.:	<u>Rural Major Collector</u>	State Class.:	<u>State</u> <u>Secondary</u>
Truck Class:	<u>AAA</u>		
ADT (current):	<u>6,870</u>		
Terrain:	<u>Mountainous</u>	Access Control:	<u>By Permit</u>
Posted Speed:	<u>35-55 MPH</u>	Median Type:	<u>Undivided</u>
Funding Type:	<u>N/A</u>		

Roadway Data:

	<u>Existing Conditions</u>	<u>Design Criteria</u>
No. of Lanes	2	2
Lane Width	11 ft	12 ft
Shoulder Width	2 ft	8 ft
Minimum Radius	286.5 ft	587 ft*
Maximum Grade	1.47%	10%

** From AASHTO's Policy on Geometric Design of Highway and Street, Ex. 3-15, 45 MPH Design Speed, 8% eMax*

Adequacy Rtg %: 93rd

Bridge Data: 048B00086N

Max. Span Length	78.3 ft
Length	196.0 ft
Width, out to out	40.0 ft
Width, curb to curb	33.5 ft
Sufficiency Rating	76.70
Year Built	1967

Table 2: Existing Conditions and Data Summary – Sections 2 & 3

County:	<u>Harlan</u>	Road Name:	<u>Highway 38</u>
Route Number(s):	<u>KY 38</u>		
Item No.:	<u>N/A</u>		
BMP:	<u>8.478</u>	EMP:	<u>17.000</u>
Segment Length:	<u>8.522 miles</u>		
Rdwy. Class.:	<u>Rural Major Collector</u>	State Class.:	<u>State</u> <u>Secondary</u>
Truck Class:	<u>AAA</u>		
ADT (current):	<u>Sect. 2: 3,760; Sect. 3: 2,070</u>		
Terrain:	<u>Mountainous</u>	Access Control:	<u>By Permit</u>
Posted Speed:	<u>35-55 MPH</u>	Median Type:	<u>Undivided</u>
Funding Type:	<u>N/A</u>		

Roadway Data:

	<u>Existing Conditions</u>	<u>Design Criteria</u>	
No. of Lanes	2	2	
Lane Width	10 ft	12 ft	
Shoulder Width	4 ft	8 ft	
Minimum Radius	Sect. 2: 141 ft; Sect. 3: N/A	587 ft*	
Maximum Grade	Sect. 2: 5.8%; Sect. 3: N/A	10%	
		<i>* From AASHTO's Policy on Geometric Design of Highway and Street, Ex. 3-15, 45 MPH Design Speed, 8% eMax</i>	
Adequacy Rtg %:	12 th		

Bridge Data:	<u>048B00158N</u>	<u>048B00012N</u>	<u>048B00013N</u>
Max. Span Length	43.0 ft	50.0 ft	10.0 ft
Length	86.0 ft	160.0 ft	26.0 ft
Width, out to out	27.0 ft	23.5 ft	44.0 ft
Width, curb to curb	24.0 ft	20.0 ft	44.0 ft
Sufficiency Rating	63.50	49.80	31.50
Year Built	1994	1938	1950

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

This 9.5 mile project lies below Black Mountain and along Clover Fork of The Cumberland River in Harlan County. USGS Quadrangles are Nolansburg, Evarts and Louellen. KY 38 is a rural major collector serving several communities providing access to work, schools, recreation, health care and shopping. Human and environmental aspects to road improvement will be addressed as part of this access improvement. Structures located in the corridor including residential, commercial and places of gathering will be reviewed for social and historic creditability. Several streams intersect the river and crossings, and if affected will need review for environmental impacts and permits. Fugitt Creek, a stream listed as special use for cold water aquatic habitat, intersects Clover Fork toward the end of the project. Drinking water intakes will be reviewed to avoid impact or disruption. US Army CORP of Engineers and Kentucky Division of Water Permits may be necessary prior to construction should water related impacts be essential. Stream crossings should not require US Coast Guard coordination due to stream size being insufficient for navigation. Impacts and funding will dictate the levels of environmental documentation.

A. Air Quality

Harlan County is currently listed attainment for all monitored air pollutants.

B. Archaeology

A Phase I archaeology survey will reveal sensitive areas that may need avoiding. If avoidance is not attainable, Phase II or III may be required. Coordination with Native Tribes will be reviewed during phases and if required this will be completed prior to final clearance.

C. Threatened and Endangered Species

Threatened and endangered species (T&E) are monitored and protected by United States Fish and Wildlife Service (USFWS), and Kentucky Division of Fish and Wildlife Resources (KDFWR). **Table 3** has the federally listed T&E species identified by USFWS, KDFWR or Kentucky State Nature Preserves Commission (KSNPC) to potentially be occupying or have the habitat present for the species to have a presence in Harlan County. A habitat assessment or biological assessment will explore in more detail the endangered species in the corridor and make recommendations of impact. This will be completed in the design phase of the project's development.

Table 3: USFWS listing of Threatened and Endangered Species in Harlan County

Group	Species	Common Name	Legal Status	Known Potential
Mammals	<i>Myotis sodalis</i>	Indiana bat	E	K
	<i>Myotis grisescens</i>	Gray bat	E	K
Fish	<i>Etheostoma susanae</i>	Cumberland darter	E	K
	<i>Phoxinus cumberlandensis</i>	blackside dace	E	K

D. Hazardous Materials

Right of way or permanent easement will be assessed for the likelihood of contaminated materials. Contaminated materials could include but not be limited to above ground tanks, underground tanks, junk vehicles, lead, asbestos and unknown substances. Likely sites could require Phase II investigation to identify or determine the extent of contamination depending on project needs. Structures will be assessed for asbestos containing materials (ACM) and a solution developed for abatement prior to construction.

E. Historic Resources

The corridor may contain structures including buildings, land, bridges, culverts or archaeological resources that could be determined historic. A thorough assessment of the corridor will be required to identify eligible historic resources.

F. Permitting

Permits will be needed for water related impacts. Applicable USACE 404, Kentucky Division of Water 401 Water Quality Certification or KPDES Storm water permits will be determined once plans are available. Fuggitt Creek is the only DOW listed special use water in the corridor.

G. Noise

The scope of the project should not require additional noise analysis.

H. Socioeconomic

Socioeconomic impacts will be determined based on impacts to community, neighborhoods and family dynamics. The area will be assessed for parks, recreation

areas, or wildlife protected areas. Direct or indirect impacts to schools, churches, businesses, police and fire protection will be assessed in the corridor.

I. Section 4(f) Resources

Once an area of potential affect is established, resources will be identified and applicability will be determined. Archaeology or historic resources could be afforded protection under Section 4(f). KYTC will try to avoid, minimize or mitigate 4(f) resources.

J. Section 6(f) Resources

Potential Section 6(f) resources will be identified and the project will take steps to avoid, minimize or mitigate.

IV. PRELIMINARY PROJECT INFORMATION

A. Utilities

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

AT&T Southeast P.O. Box 5001 Carol Stream, IL 60197	AT&T Southeast 29 Willis Branch Road Prestonsburg, KY 41653 Jack Salyer 606-874-2715 Js2299@att.com
Windstream Communications South District 719 North Main Street London, KY 40741 Bowman Hail 606-878-3258 Bowman.Hail@windstream.com	E.ON ~ U.S. 820 West Broadway; P.O. Box 32020 Louisville, KY 40232 Greg Geiser 502-627-3708 Mike.Money@lge-ku.com
City of Evarts P.O. Box 208 Evarts, KY 40828 Celdo Powers 606-837-3232	Zito Media 100 Bryson Walk; P.O. Box 729 Bryson City, NC 28713 866-732-1547

A preliminary sketch of the approximate location of some of the utilities in the project area can be viewed in **Figure 10**. This information was obtained from GIS databases. The location of utilities will need to be verified as the project survey is completed in Phase I Design.

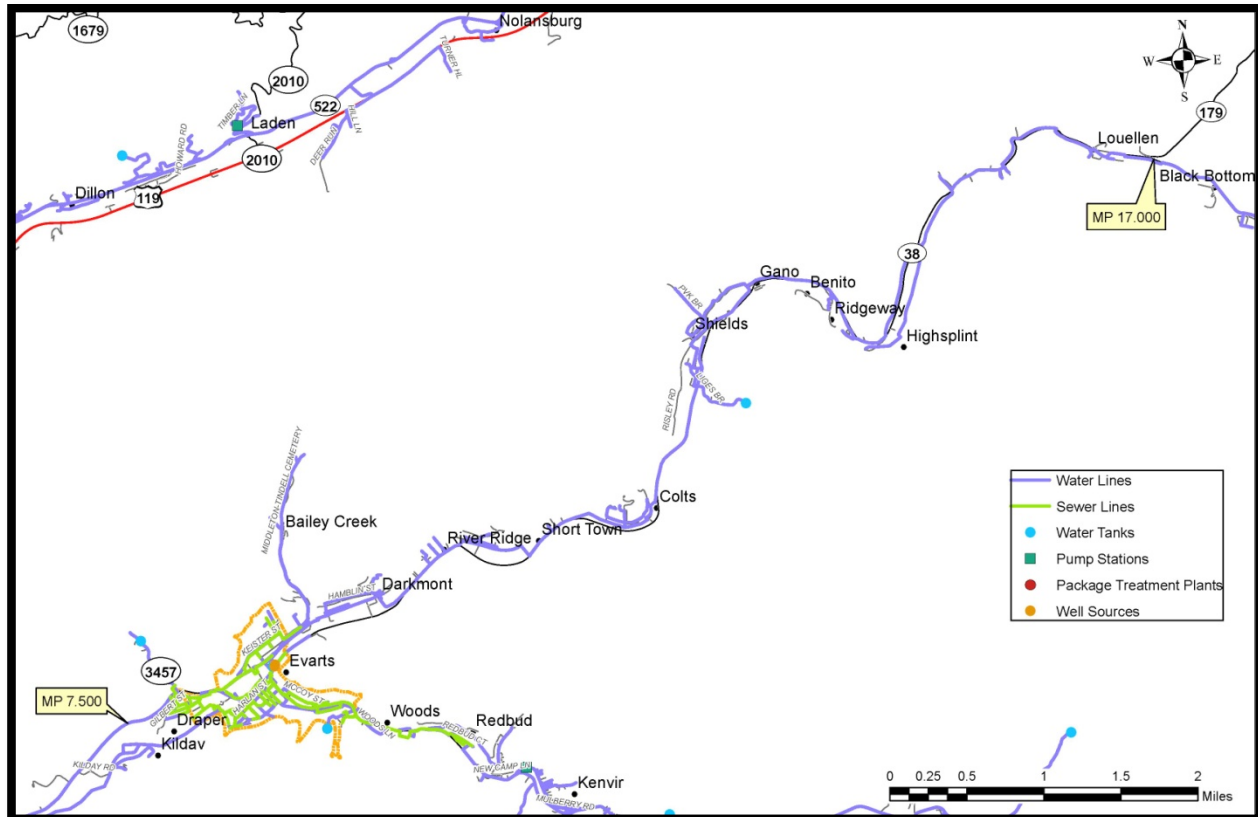


Figure 10: Utility Locations

B. Agency Coordination

Local officials and District 11 personnel met in May 2011 to discuss public concerns related to the recent slide on KY 38 in the community of Short Town, but other safety improvements along the route were also mentioned. A planning study was suggested by one official. The Project Team met on August 19, 2011 to discuss the project from Evarts to Shields. Existing conditions such as average daily traffic (ADT), alignment geometry, and geotechnical and environmental conditions were discussed. Locations indicating crashes were also shown. Problem locations that would require improvement were identified prior to the field visit. The minutes of this meeting can be reviewed in **Appendix I.**

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 38, especially east of Evarts, has a narrow roadway template with several horizontal curves that do not meet current design standards. As a result, according to data from the Kentucky State Police, there is a history of crashes at many of the curve locations. KY 38 connects the city of Evarts and other communities along the route to the city of Harlan to the west, and the state of Virginia to the east. **The purpose of this study is to identify potential spot locations on KY 38 to improve the safety, mobility, and connectivity between Evarts and Louellen.**

VI. POTENTIAL SPOT IMPROVEMENTS

There were 14 spot improvements identified by the Project Team during the development of this study. Each project is described in detail with a corresponding cost estimate that includes costs associated with design, right-of-way, utilities and construction. They are shown on the following pages.

Project 1 – MP 7.87



Looking west at KY 3457 intersection



Looking east at KY 3457 intersection

Harlan County – KY 38 near KY 3457 Intersection

Proposed Project: The existing road has multiple access points as a result of the Chevron gas station adjacent to KY 3457 and could benefit from restricting or combining access. The 0.1 mile spot at the intersection has a CRF of 0.97. A design study could analyze this location to determine if access restriction could be implemented as a low cost project. This section is posted at 55mph. A speed study could be performed to determine if the posted speed limit could be reduced.

Cost Estimate:

<i>Design:</i>	<i>\$15,000</i>
<i>ROW:</i>	<i>\$0</i>
<i>Utility:</i>	<i>\$0</i>
<i>Construction:</i>	<i><u>\$ 50,000</u></i>
<i>Total:</i>	<i>\$65,000</i>

Notes:

Project 2 – MP 8.1 to MP 8.5



Looking west from MP 8.1



Looking east from MP 8.1

Harlan County – KY 38 from MP 8.1 to MP 8.5

Proposed Project: Through this section of KY 38 there are multiple unrestricted access points which have led to a crash history. The CRF of this 0.4 mile segment is 1.10. A design study could be performed to determine if combining access points could be implemented. Field review also revealed that advanced warning signs for the railroad crossing could be beneficial.

Cost Estimate:

<i>Design:</i>	<i>\$15,000</i>
<i>ROW:</i>	<i>\$0</i>
<i>Utility:</i>	<i>\$0</i>
<i>Construction:</i>	<i><u>\$ 50,000</u></i>
<i>Total:</i>	<i>\$65,000</i>

Notes:

Project 3 – MP 8.6



Looking east, in the town of Evarts

Harlan County – KY 38 at KY 215 near MP 8.6

Proposed Project: Perform turn movement counts to determine if auxiliary lanes are warranted near KY 215 approach. The CRF at the intersection is 1.50. Perform tree clearing and possible curve realignment and minor widening near MP 8.6.

Cost Estimate:

<i>Design:</i>	<i>\$100,000</i>
<i>ROW:</i>	<i>\$50,000</i>
<i>Utility:</i>	<i>\$50,000</i>
<i>Construction:</i>	<i><u>\$ 750,000</u></i>

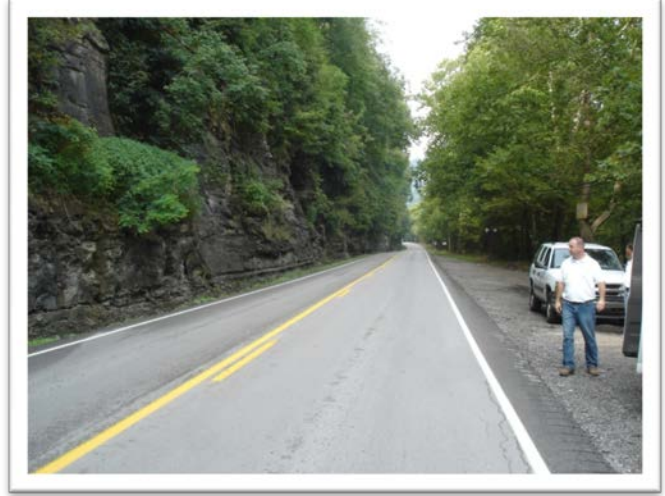
Total:	\$950,000
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Notes:

Project 4 – MP 9.3 to MP 9.6



Looking east at MP 9.35



Looking west at MP 9.35

Harlan County – KY 38 from MP 9.3 to MP 9.6

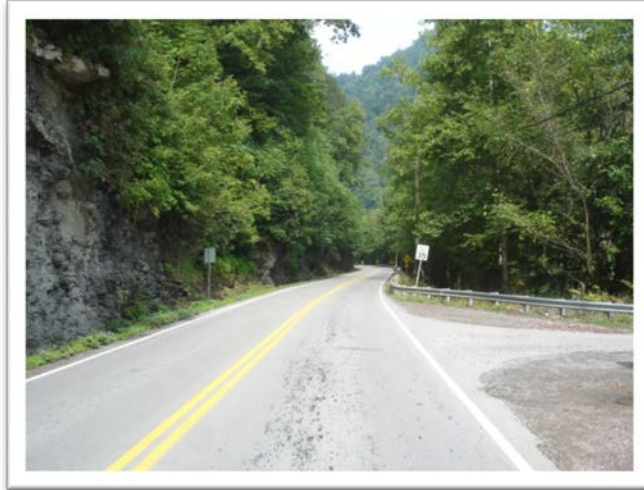
Proposed Project: There were four rear end and three single vehicle crashes over the three year period from May 2008 to April 2011. Driving lanes at this location are 11 feet wide with approximate 2 foot shoulders. As a result of rear end crashes and vehicles leaving the shoulder, the 0.3 mile spot CRF is 1.30. It is recommended to widen shoulders to improve recovery area and provide advanced warning signs for approach roads.

Cost Estimate:

<i>Design:</i>	<i>\$0</i>
<i>ROW:</i>	<i>\$0</i>
<i>Utility:</i>	<i>\$0</i>
<i>Construction:</i>	<i><u>\$ 100,000</u></i>
<i>Total:</i>	<i>\$100,000</i>

Notes:

Project 5 – MP 10.1



Looking west towards curve from Tom Coal Road (MP 10.2)

Harlan County – KY 38 at MP 10.1 – Curve Improvement

Proposed Project: Four crashes occurred at this 0.1 spot from May 2008 – April 2011. This project is in the 2012 Highway Plan as Item No. 11-8704.00 for a curve improvement.

Cost Estimate:

<i>Design:</i>	<i>\$550,000</i>
<i>ROW:</i>	<i>\$200,000</i>
<i>Utility:</i>	<i>\$150,000</i>
<i>Construction:</i>	<i><u>\$ 1,200,000</u></i>

<i>Total:</i>	<i>\$2,100,000</i>
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Notes:

Project 6 – MP 10.8 to MP 11.1



Looking east on KY 38 at MP 10.3



Looking west on KY 38 at MP 11.3

Harlan County – KY 38 from MP 10.8 to MP 11.1 – Realignment

Proposed Project: This location experienced a severe slide during the winter of 2011. The existing corridor cannot be widened due to the proximity of the Clover Fork of the Cumberland River to the north and the existing cut to the south. Traffic could not be maintained during widening. Following field review the project team recommends a reconstructed alignment. The proposed alignment would leave existing KY 38 near MP 10.6 and cross the Clover Fork of the Cumberland River. Once across the river, the new alignment would be constructed to minimize impacts to the community of Colts, then re-cross the Clover Fork and tie back to existing KY 38 near MP 11.1.

Cost Estimate:

<i>Design:</i>	<i>\$750,000</i>
<i>ROW:</i>	<i>\$750,000</i>
<i>Utility:</i>	<i>\$500,000</i>
<i>Construction:</i>	<i><u>\$ 4,500,000</u></i>
<i>Total:</i>	<i>\$6,500,000</i>

Notes:

Project 7 – MP 11.5



Looking east at MP 11.5

Harlan County – KY 38 at MP 11.5 – Curve Improvement

Proposed Project: Horizontal curve of class D leads to 0.1 mile spot CRF of 1.09, with the all crashes occurring on wet or icy pavement. Construct curve widening to improve recovery zone and remove trees to improve sight distance along existing curve.

Cost Estimate:

<i>Design:</i>	<i>\$0</i>
<i>ROW:</i>	<i>\$0</i>
<i>Utility:</i>	<i>\$50,000</i>
<i>Construction:</i>	<i><u>\$ 200,000</u></i>

<i>Total:</i>	<i>\$250,000</i>
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Notes:



Looking west along KY 38 at MP 12.2

Harlan County – KY 38 from MP 11.9 to MP 12.1 – Curve Improvement

Proposed Project: Construct curve widening to improve recovery zone and remove trees along south side of KY 38 to improve sight distance along existing curve. Five crashes have occurred over a three year period, all involving a single vehicle, along the 0.2 mile segment. The CRF is 0.92.

Cost Estimate:

<i>Design:</i>	<i>\$0</i>
<i>ROW:</i>	<i>\$0</i>
<i>Utility:</i>	<i>\$50,000</i>
<i>Construction:</i>	<i><u>\$ 250,000</u></i>
<i>Total:</i>	<i>\$300,000</i>

Notes:

Project 9 – MP 12.87



Looking east across bridge on KY 38



Looking east after crossing bridge on KY 38

Harlan County – KY 38 at MP 12.87 – Bridge Replacement and Curve Realignment

Proposed Project: The existing bridge is narrow, with no shoulders, and therefore is structurally deficient. The curve near MP 12.9 should also be improved. Replace the existing bridge and improve approaches.

Cost Estimate:

<i>Design:</i>	<i>\$350,000</i>
<i>ROW:</i>	<i>\$150,000</i>
<i>Utility:</i>	<i>\$100,000</i>
<i>Construction:</i>	<i><u>\$ 1,800,000</u></i>
Total:	<i>\$2,400,000</i>

Notes:

Project 10 – MP 13.29



Looking east approaching railroad



Looking east at railroad

Harlan County – KY 38 at MP 13.29 – Curve Realignment

Proposed Project: Existing horizontal curve immediately after CSX railroad crossing at MP 13.29. Curve should be reconstructed to improve approach geometry to the rail crossing and improve the existing curve radius.

Cost Estimate:

<i>Design:</i>	<i>\$150,000</i>
<i>ROW:</i>	<i>\$50,000</i>
<i>Utility:</i>	<i>\$100,000</i>
<i>Construction:</i>	<i><u>\$ 900,000</u></i>
Total:	<i>\$1,200,000</i>

Notes:



Looking west at MP 15.3

Harlan County – KY 38 from MP 14.2 to MP 14.6

Proposed Project: Approach roads are prevalent along this portion, one of which is heavily used by trucks as it leads to an industrial building. Six crashes have occurred along the 0.4 mile segment, due to the approach roads and the minimal shoulder length. CRF is 1.04. Provide curve widening and construct auxiliary lanes to accommodate turning truck movements.

Cost Estimate:

<i>Design:</i>	<i>\$150,000</i>
<i>ROW:</i>	<i>\$100,000</i>
<i>Utility:</i>	<i>\$100,000</i>
<i>Construction:</i>	<i><u>\$ 1,500,000</u></i>
<i>Total:</i>	<i>\$1,850,000</i>

Notes:



Looking east at MP 15.4

Harlan County – KY 38 from MP 15.3 to MP 15.7 – Improve S-Curve

Proposed Project: Crash data indicates crashes during wet pavement conditions, especially over the branch of the Clover Fork River at MP 15.3. At the S-curve at MP 15.7 the 0.1 mile spot CRF is 1.49. Propose resurfacing with high friction asphalt and providing shoulder widening from MP 15.3 to MP 15.7.

Cost Estimate:

<i>Design:</i>	<i>\$0</i>
<i>ROW:</i>	<i>\$0</i>
<i>Utility:</i>	<i>\$0</i>
<i>Construction:</i>	<i><u>\$ 250,000</u></i>

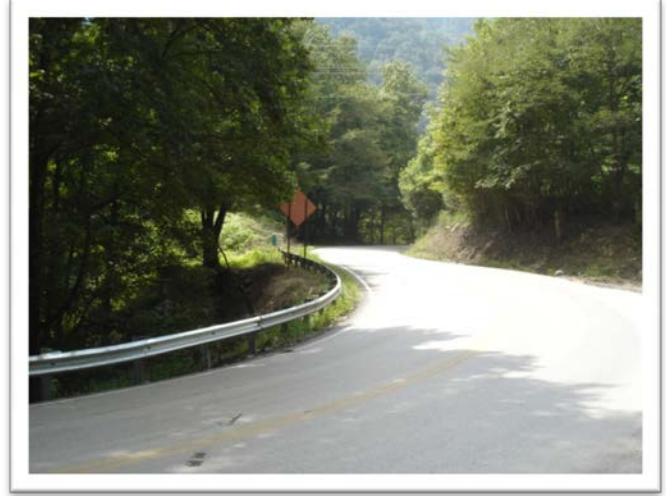
<i>Total:</i>	<i>\$250,000</i>
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Notes:

Project 13 – MP 16.0



Looking east at MP 16.0



Looking west at MP 16.0

Harlan County – KY 38 at MP 16.0 – S-Curve Realignment

Proposed Project: Although crashes haven't been a problem and the CRF doesn't approach 1, the horizontal curve class is F. Reconstruct the existing S-Curve from MP 15.9 to MP 16.1 to correct this problem.

Cost Estimate:

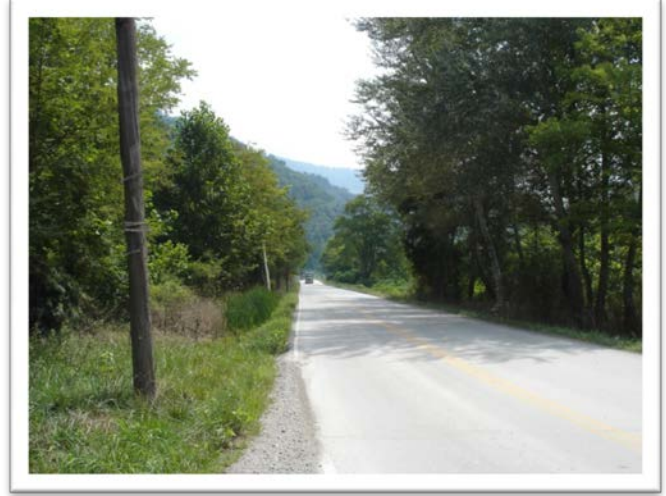
<i>Design:</i>	<i>\$300,000</i>
<i>ROW:</i>	<i>\$150,000</i>
<i>Utility:</i>	<i>\$75,000</i>
<i>Construction:</i>	<i><u>\$ 1,000,000</u></i>
Total:	<i>\$1,525,000</i>

Notes:

Project 14 – MP 16.6



Looking west at MP 16.7



Looking east at MP 16.7 from abandoned railroad

Harlan County – KY 38 at MP 16.6 – Curve Realignment

Proposed Project: 0.1 mile spot CRF at MP 16.7 is 1.12. All crashes were a result of the horizontal curve. Adjacent railroad is abandoned, gravel and rocks remain. Existing curve around building near MP 16.7 should be realigned to improve approach geometry.

Cost Estimate:

<i>Design:</i>	<i>\$300,000</i>
<i>ROW:</i>	<i>\$300,000</i>
<i>Utility:</i>	<i>\$75,000</i>
<i>Construction:</i>	<i><u>\$1,000,000</u></i>
<i>Total:</i>	<i>\$1,675,000</i>

Notes:

VII. SUMMARY

This study is a programming study to include fourteen potential spot improvements along a nearly ten mile section of the KY 38 corridor in Harlan County. 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 38, east of Evarts, has a narrow roadway template with several horizontal curves that do not meet current design standards.
- There is a collision history at many of the horizontal curve locations causing the CRF to be greater than 1, therefore crashes may not be occurring at random.
- KY 38 connects the community of Evarts and many other communities along the route to the city of Harlan to the west and the state of Virginia to the east.

The purpose of this study is to identify potential spot locations along the KY 38 corridor to improve the safety, mobility, and connectivity between Evarts and Louellen.

This programming study involves fourteen potential spot improvements at various points along the KY 38 corridor. Suggested improvements at various spots include combining access points, adding advanced warning signage, clearing trees to aid with sight distance, realigning horizontal curve(s), minor widening of the shoulder(s), reconstructing the alignment, replacing a bridge, constructing an auxiliary lane(s), and resurfacing driving lanes with high friction asphalt.

One of the fourteen spot improvements is in the current 2012 Highway Plan, and the description along with the funding information follows:

- **Item No. 11-8704.00, Harlan County**

<u>Funding</u>	<u>Phase</u>	<u>Year</u>	<u>Amount</u>
SPP	D	2013	\$550,000
SPP	R	2013	\$200,000
SPP	U	2013	\$150,000
SPP	C	2014	\$1,200,000

IMPROVE SAFETY ON DEAD MAN'S CURVE NEAR MP 10.1. (12CCN)

Purpose and Need: SAFETY/SAFETY (P)