Pre-Design Scoping Study

Lawrence County
KY32 from US23 to KY3
Item No. 12-8405.00

Prepared By:
KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
DIVISION OF PLANNING
FOR
PIKEVILLE-DISTRICT 12 PLANNING
October 2010

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I. INTRODUCTION

a. Study Purpose

The purpose of this Pre-Design Scoping Study is to provide support early for the Pre-Construction phase in order to better define the concerns of this project. This report will provide support by the following:

- Better define the intent of the project before the design process actually begins
- Initiate project requests for information needed for design activities
- Discuss possible alternatives as set forth by the District Project Team
- Identify possible practical solutions using operations and maintenance rather than capital construction
- Document agency recommendations to streamline future design efforts

b. Location

This project is located in the community of Louisa, along KY32 beginning at US23 and continuing east and then north to the intersection of KY3 (mile point (MP) 27.640 to 29.162) in Lawrence County, Kentucky. (Figure 1). It lies within the north east corner of the Louisa and the north west corner of the Adams USGS Quadrants.

c. Project Purpose and Need

KY32 provides a crucial connection between the city of Louisa and US23. Existing roadway conditions need improvement to enhance safety, mobility and connectivity for downtown Louisa and to accommodate social demands for retail, residential, and recreational opportunities. Appendix F contains in detail the Nine Elements of a Purpose and Need Statement as specified by National Environmental Protection Act (NEPA).

Lawrence County, Kentucky
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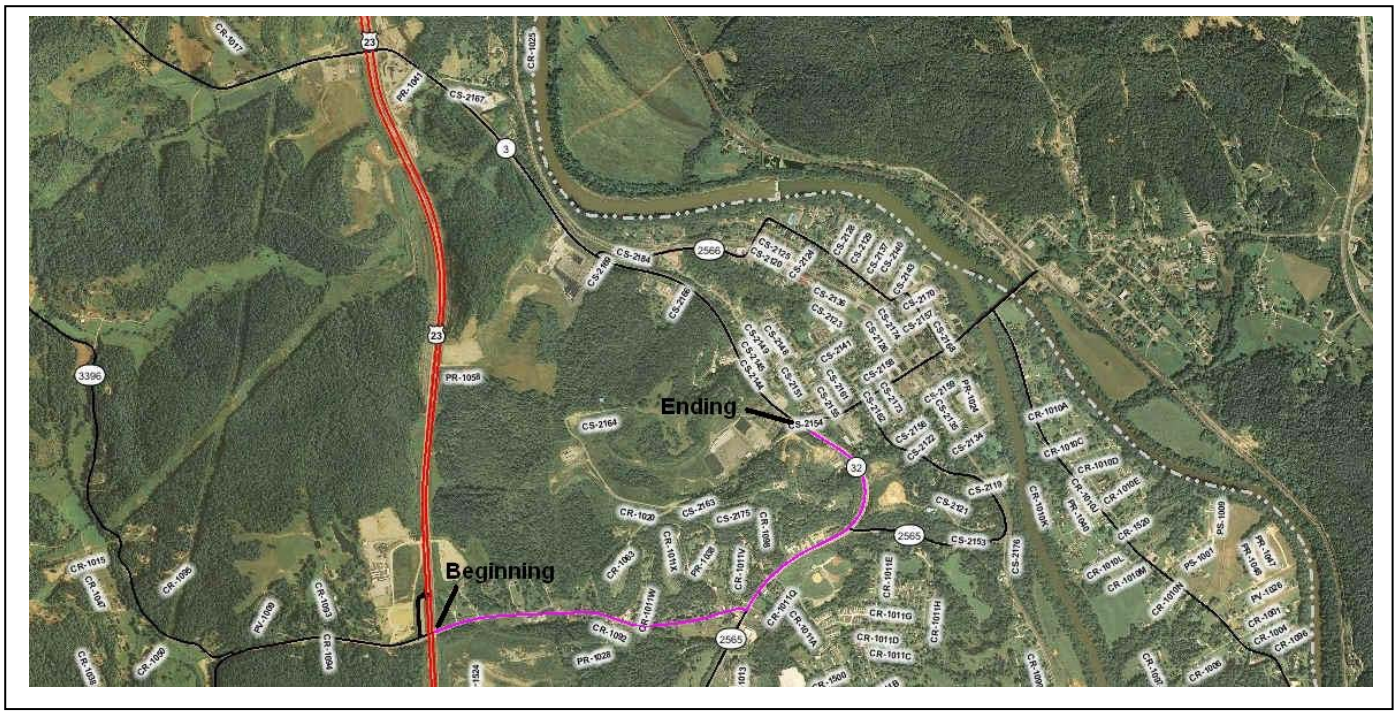


Figure 1: Project location

d. Programming Schedule

This project is currently scheduled in the 2010-2011 Two-Year Highway Plan for Lawrence County as Item No. 12-8405.00. Phasing and cost estimates are as follows:

Phase	**Fiscal Year**	**Estimate**
Design	2010	500,000
Right of Way	2010	1,500,000
Utilities	2010	1,000,000
Design	2011	4,500,000
	Total	$7,500,000

Note: Appendix A contains more details regarding funding.

II. Existing Conditions

a. Roadway Characteristics for KY32

The roadway can be split into two sections. One is exclusively a two-lane road while the second section can be characterized as an undivided, multilane route. Section One begins at US23 and proceeds easterly to the intersection with KY2565 (MP 27.64 to 28.466). Section Two begins at KY2565 and proceeds northerly to the intersection with KY3 (MP 28.466 to 29.162)

i. Highway Information System

1. System

Section No	Functional Classification System	State Class System	NHS	TrkWtClass
One	FC 7, Rural Major Collector	State Secondary	No	AAA
Two	FC 7, Rural Major Collector	State Secondary	No	AAA

2. Existing Geometrics

Section No.	Geometric	HIS	Observed/Plans
One	Lanes	2	2
One	Lane Width	11	10-10.5 feet
One	Shoulder Width	3	<2 feet
One	Right-of-Way Width	N/A	See Appendix F
Two	Lanes	2	2-4
Two	Lane Width	11	11-12 feet
Two	Shoulder Width	10	8-10 feet
Two	Right-of-Way Width	N/A	See Appendix F

3. Posted Speed Limit

Section No.	Posted Speed
One	55 MPH
Two	45 MPH

4. 2008 Coal Haul (in Tons Annually)

Section No.	Cardinal Direction	Non-Cardinal
One	183,216	0
Two	265,827	0

5. Terrain

Section No.	EV value	Observed
One	3	Level to Rolling
Two	3	Rolling

6. Adequacy Rating

Section No.	Mile Point Range	Adequacy Percentile
One	27.600-27.943	99.99
One	27.943-28.466	45.84
Two	28.466-29.162	40.03

ii. Crash Analysis

A crash analysis from January 1, 2007 to December 31, 2009 revealed 6 types of crashes totaling 45 vehicular accidents along the project corridor. The events predominately occurred at intersections. Events outside of the intersections involved collisions with animals (2) and rear end accidents (2). The vast majority of crashes occurred at one of four intersections along the corridor. The following is general summary of events and severity:

Location	# of events	# of Veh	Injuries	Fatalities
KY32@KY2565 (S)	8	16	6	2
KY32@KY2565 (N)	3	5	3	0
KY32@KY3	29	58	14	0
Other	5	9	4	0
TOTALS	45	88	27	2

0

The following is a summary of event types at the same locations:

Location	Angle	Rear End	Head-On	Sideswipe	Single
KY32@KY2565 (S)	2	3	1	1	1
KY32@KY2565 (N)	0	2	0	0	1
KY32@KY3	11	16	0	1	1
Other	1	2	1	0	1
TOTALS	14	23	2	2	4

Crash rates factors(CRF) for the project were below the critical threshold of 1.00 for similarly classed roadways. Even at an analysis level of one-tenth of a mile, only the KY3/KY32 intersection resulted in a CRF above 1 with a value of 2.26. The four intersections along this project accounted for 90% of all the recorded accidents.

For accident details see Appendix C.

iii. Existing and Forecasted Traffic Volumes

Traffic volumes along each of the sections of KY32 differ by a factor of nearly three. However, the rate of change in the two segments is very similar. The following is an estimate of volume for the year 2030:

Section One	2009 ADT = 3200	2030 ADT = 5200
Section Two	2009 ADT = 10000	2030 ADT = 18000

Appendix D contains data used to develop the forecast

b. Future Transportation Projects

Currently, no other projects are scheduled for construction along the portion of KY32. However, Section 2a-Portion Two of this project is scheduled for resurfacing during the current Fiscal Year (2011). Another project, Item No. 12-284, has been designed and is in the process of acquiring additional right-of-way to improve KY32 to the west of US23. This project is immediately adjacent to 12-8405 and has $20,250,000 budgeted for construction in FY 2011.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

a. Ecological Overview

The ecological impacts appear to be limited to the possible disturbance of a blue line stream called Burgess Branch. Burgess Brach begins north of KY32 and crosses through a culvert around mile point 27.75. Further in 1987, US23 was reconstructed with an open channel ditch constructed along the west side of the roadway. Evidence suggests that Burgess Branch overflows regularly and floods the roadway in the vicinity of Town Hill Road. Also noted is a stand of cat tails adjacent to the intersection with Town Hill Road. The origin of the water is unknown, but may be from a long term waterline leak. Figure 9 depicts the extent of the overflow

i. Air Quality

The portion of Lawrence County which this project lies is in attainment for all transportation related air pollutants. However, the Environmental Protection Agency is poised to change the 2.5 micron particulate threshold. Therefore, regulations may need to be reviewed to determine if the area is still in attainment.

ii. Noise

Since capacity is not an issue with this project, any work will be to correct potential safety and geometric deficiencies. Therefore noise impacts are not anticipated.

iii. Aquatic Ecosystems

A 401 permit should be anticipated. The degree of re-alignment associated with Section One, will determine the type of permit that will be required. This project may also encounter wetland areas which may result in "in-lieu" fees.

iv. Threatened and Endangered Species

The Indiana Bat (Myotis Sodalis) and the Fanshell Mussel (Cyprogenia Stegaria) are listed as inhabiting the project area. The Indiana Bat Conservation Fund (IBCF) can be utilized to compensate for any potential habitat loss that may occur as a result of this project. A Biological Assessment (BA) may be required for the Fanshell Mussell.

v. Historic Preservation (Section 4F) and 106 areas

This project was originally planned to use State Funds (SP). However in the latest enacted budget, Federal Statewide Transportation Program (STP) funds are budgeted. Therefore, while no suspected properties have been noted, an historical survey may be necessary.

vi. UST/HAZMAT

Two service stations are adjacent to the project area. Unless, additional right-of-way is anticipated from either property, UST/HAZMAT will not need to be investigated. No other issues are anticipated with this project

b. Socioeconomic & Environmental Justice

i. Socioeconomic

This project should not create any major or permanent hardships for any individuals or businesses. However, if a re-alignment of KY32 is chosen, some residences may be impacted.

ii. Environmental Justice

While relocations are possible, the project will not result in a disproportionate negative impact on low-income or minority populations according to available information.

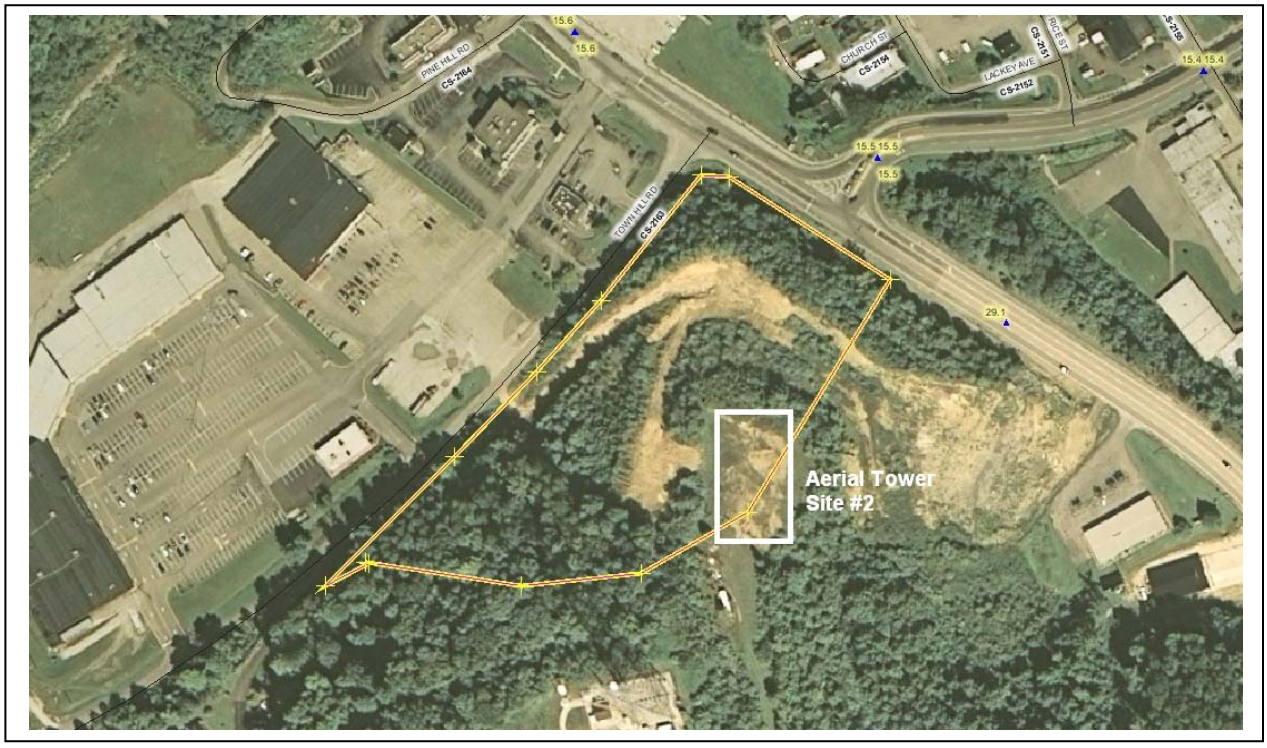
IV. PROPOSED IMPROVEMENTS

a. Possible Alternatives

This section identifies ideas compiled during Project Team Meetings on July 6, 2010. As always, "Do Nothing" is an option and is implied in each section.

i. **Reconstruct the Intersection of KY3, Town Hill Road & KY32 with better left turn lane storage**.

During meetings with District 12, a re-alignment of Town Hill Road with the KY3/ KY32/Madison Street intersection considered the removal of approximately ½ million CY of rock excavation and construction of about 750 feet of roadway. However, preliminary estimates identified the possible relocation of one aerial tower site. Due to relocations, Option 1A (below) was deemed too costly to pursue. Just the rock excavation is estimated to cost $3.0 Million.



Option 1A. Re-alignment of Town Hill Road with the KY3/ KY32/Madison Street intersection

A second alternate to closing Town Hill Road would be to re-align about 650 feet of road through an existing retail mall to an existing traffic signal. This alternative would need to be negotiated with the mall owner(s) and the city to determine if it is acceptable with both parties. This alternative ($1.010 Million) would allow the increase of left turn bays to the mall as well as to Madison Street from KY3. (Photo #1, next page)

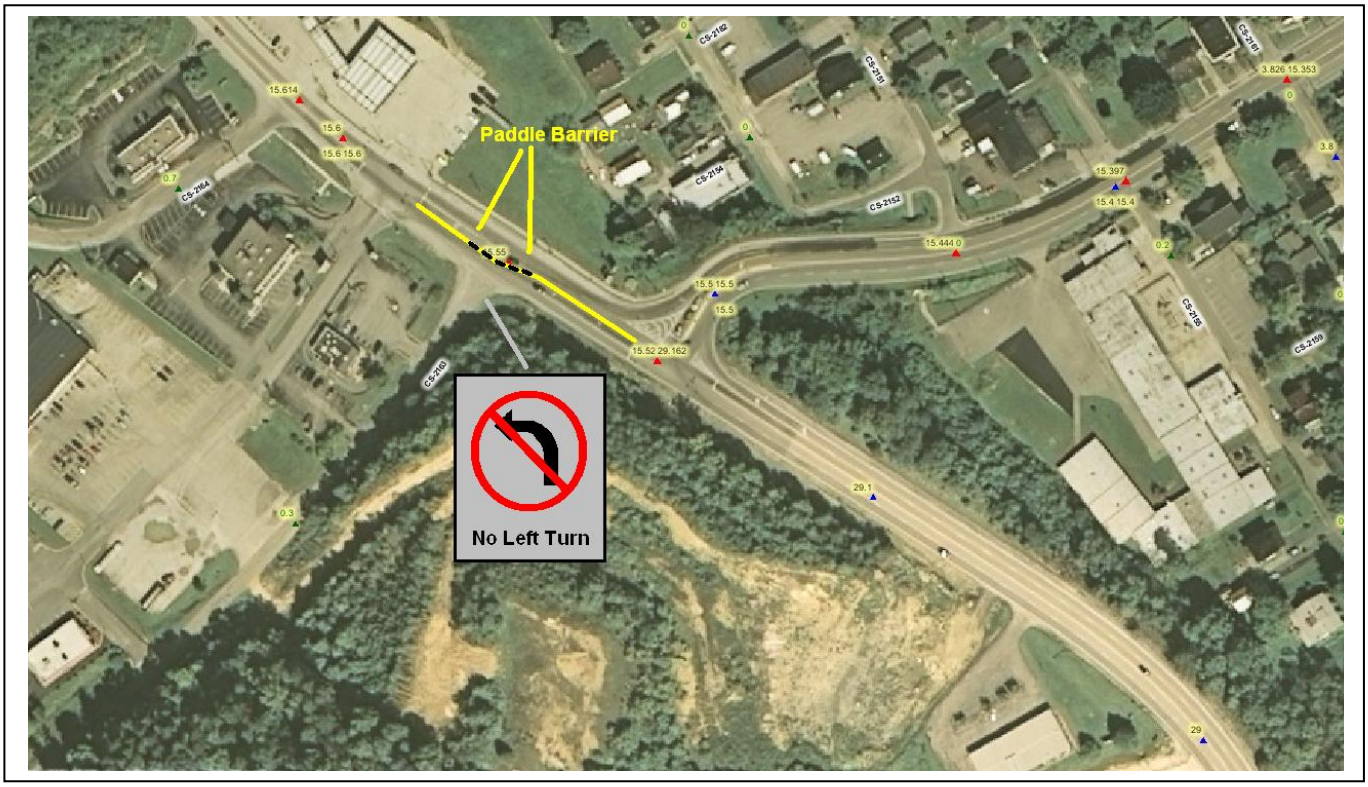
Option 1B: Re-alignment of Town Hill Road through Mall

Regardless of which option, another improvement proposes to modify the operation of the intersection. To potentially reduce the occurrence of angle crashes associated with left turns from KY3 to Madison Street, a new style of signal head is proposed for District consideration. The new signal head would provide a green arrow for protected left turns followed by a flashing yellow arrow for permissive left turns. Public announcements are recommended to explain this signal system.(Below)

Photo 1: Flashing Yellow (simulation) for Permissive Left Turn

Reconstruct the Intersection of KY3, Town Hill Road & KY32 with better left turn lane storage (continued)

Another geometric option (Option 2) would consider the partial closing of Town Hill Road(Below). A public meeting to investigate the possibilities of closing Town Hill Road is recommended with this improvement option. The elimination of left turns will allow an increase in the left turn storage on KY 3 to Madison Street (KY3) and turns into the mall entrance. This expansion of left turn storage is common with all three geometric options. The estimated cost for this option is $35,000.



Option 2. Possible Partial Closure of Town Hill Road

ii. Rehabilitate KY32 from KY3 to second intersection with KY2565

This section of the project (Section Two) is in need of re-surfacing as noted by longitudinal cracks (Photos 2 & 3 below). Also crash data suggests that some drivers are confused as a lane is dropped just before the existing intersection with KY2565. Therefore, a striping and signage plan is suggested to better delineate orderly flow of traffic. This includes but is not limited to earlier signage designating the westerly right lane as a right turn only lane. (Figure 2) In the easterly direction, KY32 has two lanes. At the crest of the vertical curve is the first KY2565 intersection. To accommodate left turns, signage prior to the intersection needs to direct traffic to the right lane. In doing so, the left turn can be dedicated as a left turn only lane. Figures 2 & 3(next page) reflect open meeting discussions.

Photos 2 & 3: Existing Roadway. KY3 to the 2nd KY 2565 Intersection

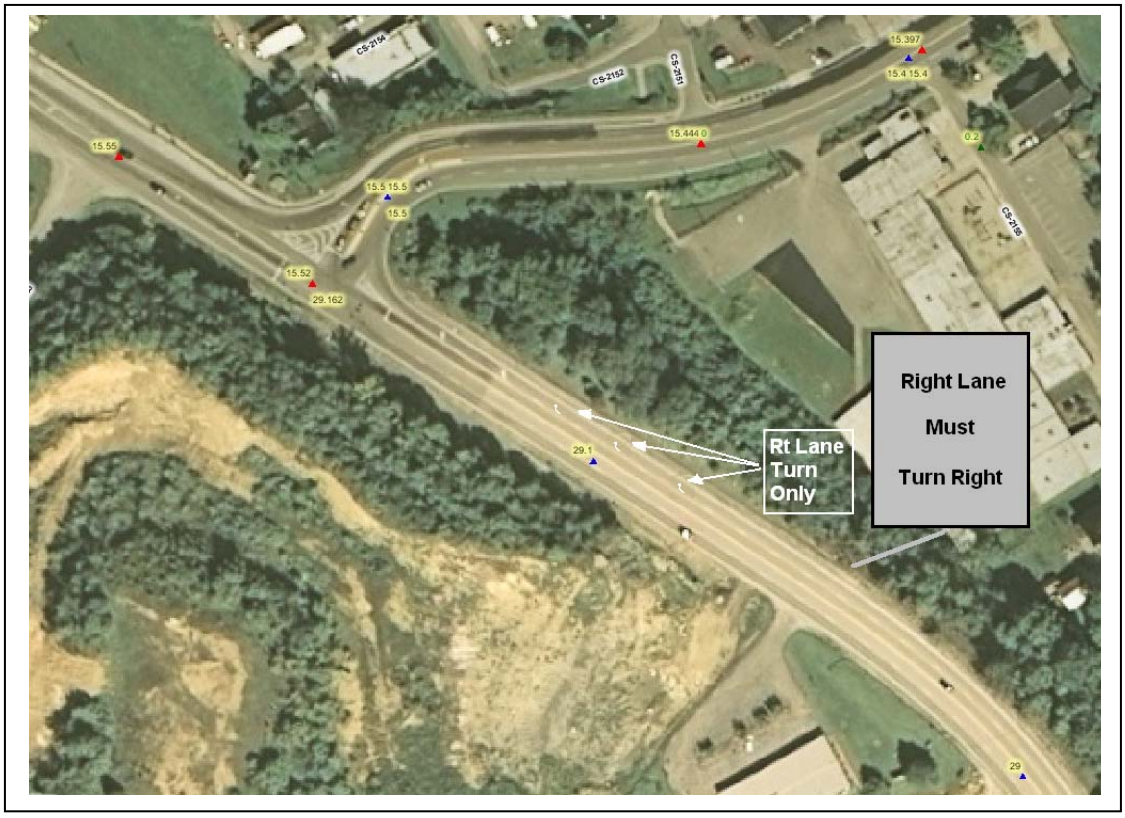


Figure 2: Paint and Signage Option for KY3 & KY32

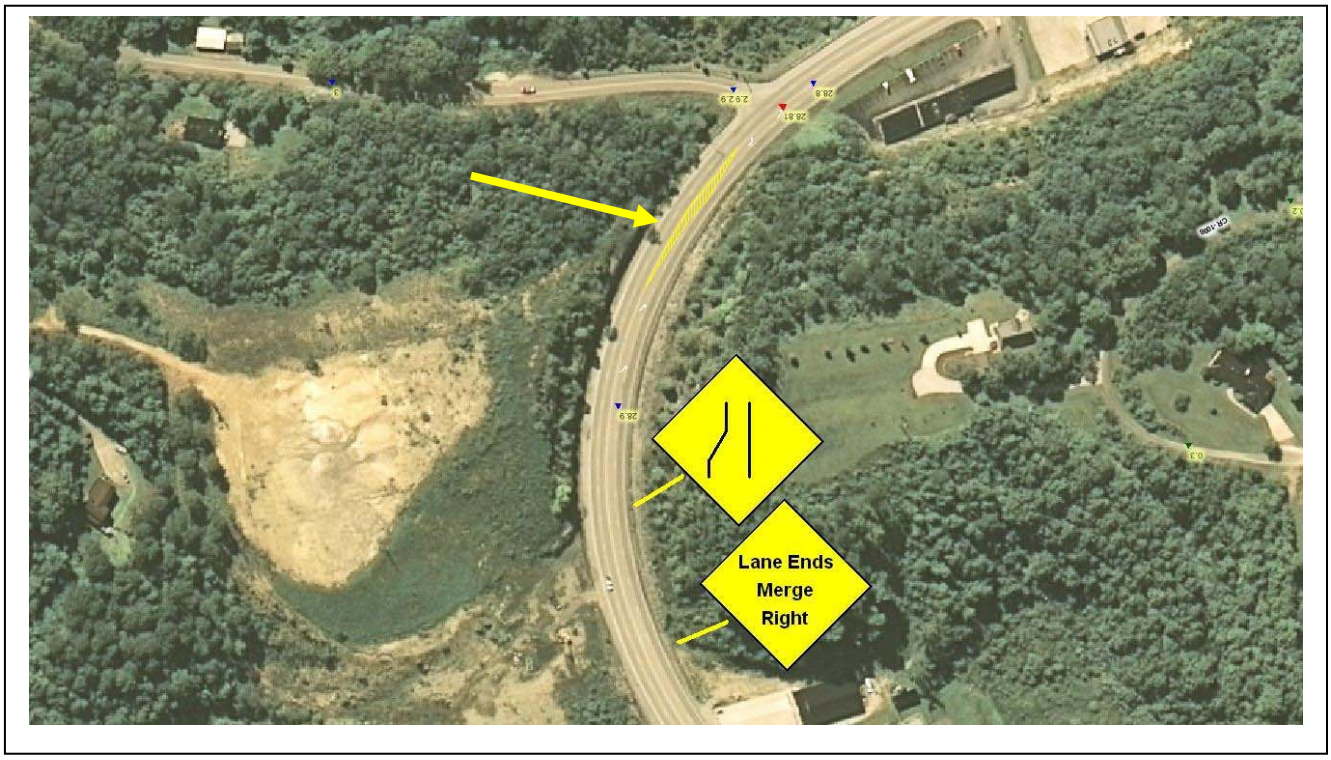


Figure 3: Paint and Signage Option for KY 32 & KY2565

iii. Reconstruct KY32 and KY2565 intersection

This is the second intersection between these roadways and is in the vicinity of a Kentucky Fried Chicken (KFC) restaurant. The popular route for south bound traffic is to stop just beyond the intersection to make a left turn. No left turn exists to allow through traffic to pass. Another deficiency of the intersection is the turning radius available for south bound traffic to turn right. While a right turn lane exists, traffic uses the shoulder in the process of making the right turn. Large trucks also must encroach other lanes to complete the turn.(Photo 4).

Photo 4: Right Turn to Section One of KY 32

Option 1 would consider access management such as paddle barriers prohibiting left turns into KFC south of the intersection and improvements to the north entrance to KFC to accommodate south bound traffic to KFC. This option will require discussions with KFC since their flow of parking and the drive thru may be affected. (Figure 4) The estimated cost for this option is about $100,000.

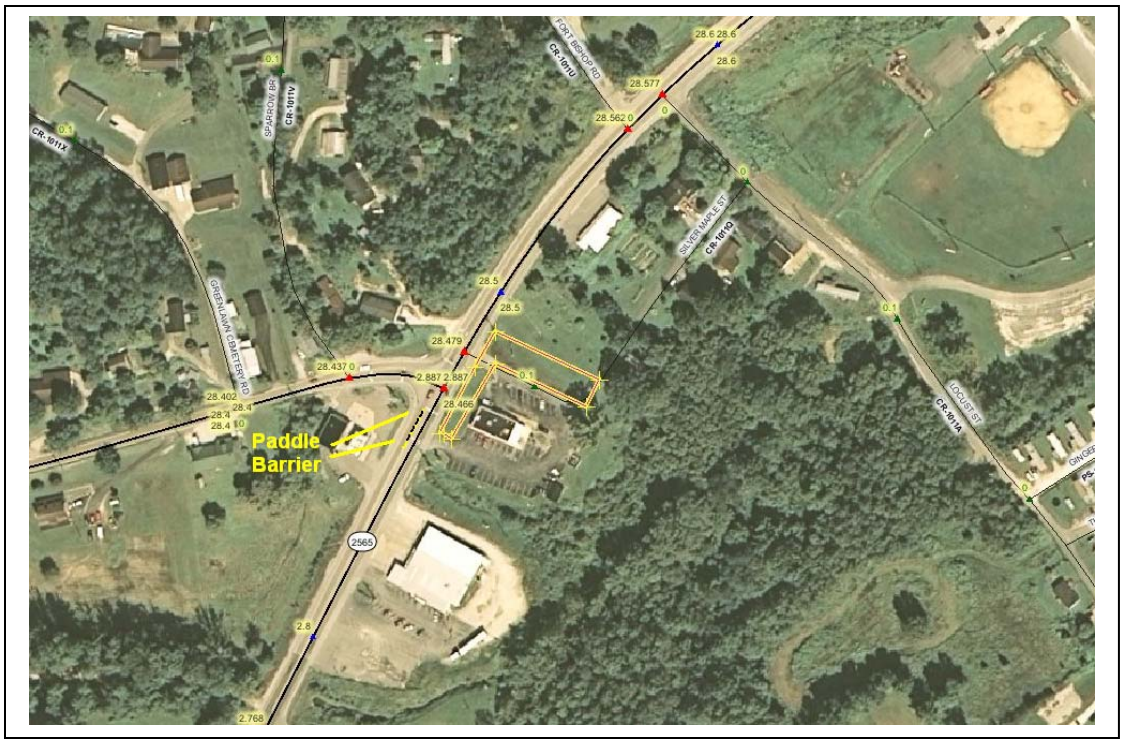


Figure 4: Option 1, Access management for KFC

A second option would consider moving the intersection south of its present location and constructing about 650 feet of new road. Moving the intersection just south of an existing Marathon gas station and across from a Dollar Store will impact at least one residential property and utilities. The estimated cost for this option is almost $1,000,000. (Figure 5)

Figure 5: Option 2(Tiii O_2), Re-locate intersection

iv. Reconstruct KY32 from mile point 28.2 to 28.466

This portion of Section One lacks sidewalks and contains vertical and horizontal curves offering limited site distance. The pavement width falls short of the current design criteria of a road with ADT greater than 1,500.

One option is to widen the road and improve shoulders to meet minimum standards. Such a widening would be best accomplished by making improvements on the south side. Any improvements on the north side will impact existing underground utilities and may lead to the acquisition of property due to steep side slopes. Widening to the south will impact overhead utilities on possibly two properties. The estimated cost for the option is just over $2,000,000. If Option 2(Tiii O_2) as shown in Figure 5 is implemented, an easterly portion of the widening in the figure below can be eliminated (Tiii O_2 credit). The estimated cost for the reduced scope is about $1.75 Million

Figure 6: Option 1, Widening existing alignment of KY 32 from MP 28.2 to 28.466

Reconstruction of KY 32 from MP 28.2 to 28.466 (continued)

A second option would be to re-route KY 32 for approximately 1900 feet to intersect with KY2565 south of the Dollar Store (approx MP 2.77). The re-routing of KY 32 would begin at mile point 28.2, continue parallel to Burgess Branch near an old construction entrance to Walmart, and intersect KY 2565. The new route would impact three parcels, but not require the taking of residences. Water, sewer, and overhead utilities would require relocation. Care would be necessary to safeguard the stream and the existing culvert underneath KY 2565. The estimated cost for this option is just over $3,000,000. (Figure 7)

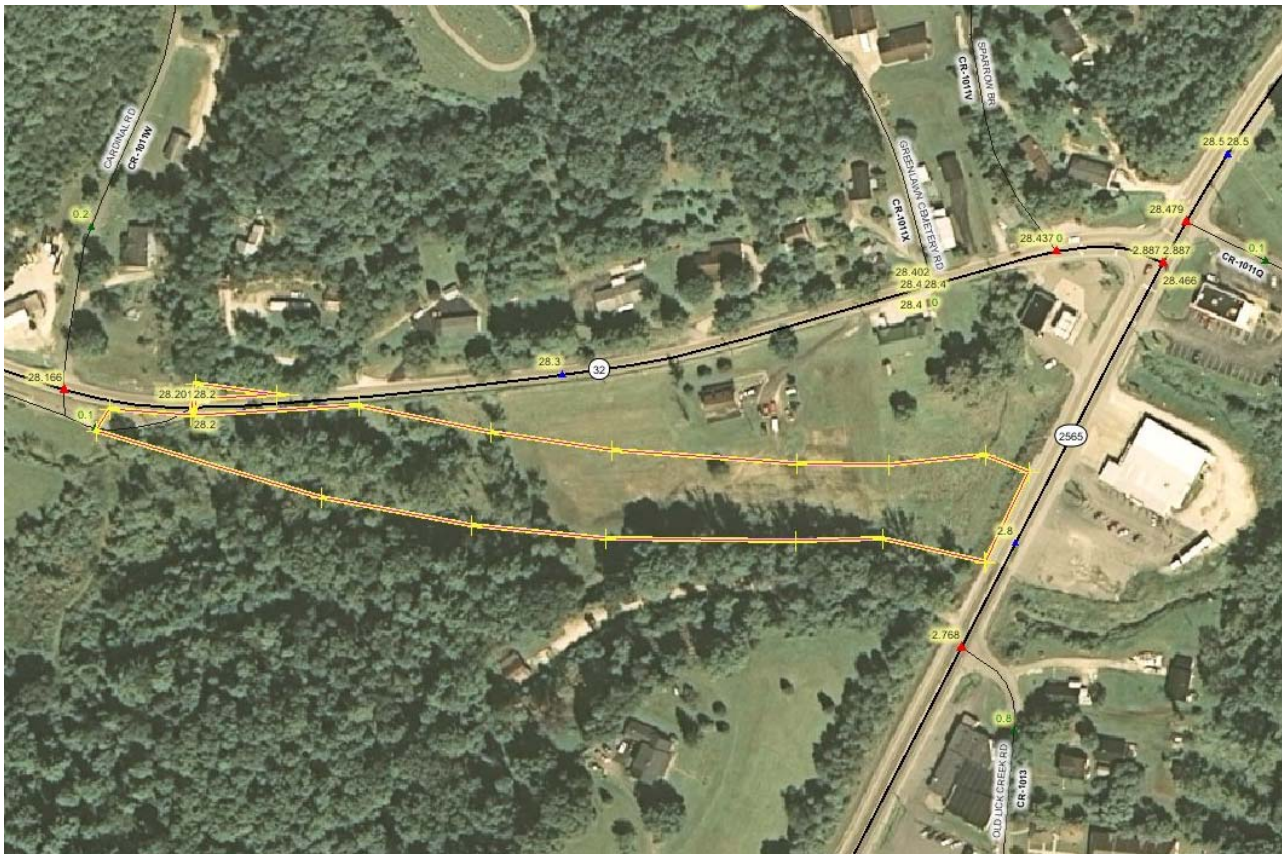


Figure 7: Option 2, re-route KY 32

v. Reconstruct KY32 from mile point 28.2 to 28.1 (Segment A)

Most of the remaining portion of Section One currently has good sight distance and shoulders. Only the eastern segment of 0.2 miles (1,000 feet) needs improving which would be best done by widening to the north where no homes would be impacted. However, underground utilities would be impacted as well as an entrance to Greenlawn Cemetery. Any widening to the south would have significant impact to at least three homes and access to six others along Finch Lane. The estimated cost for Segment A of Section One is about one million dollars.

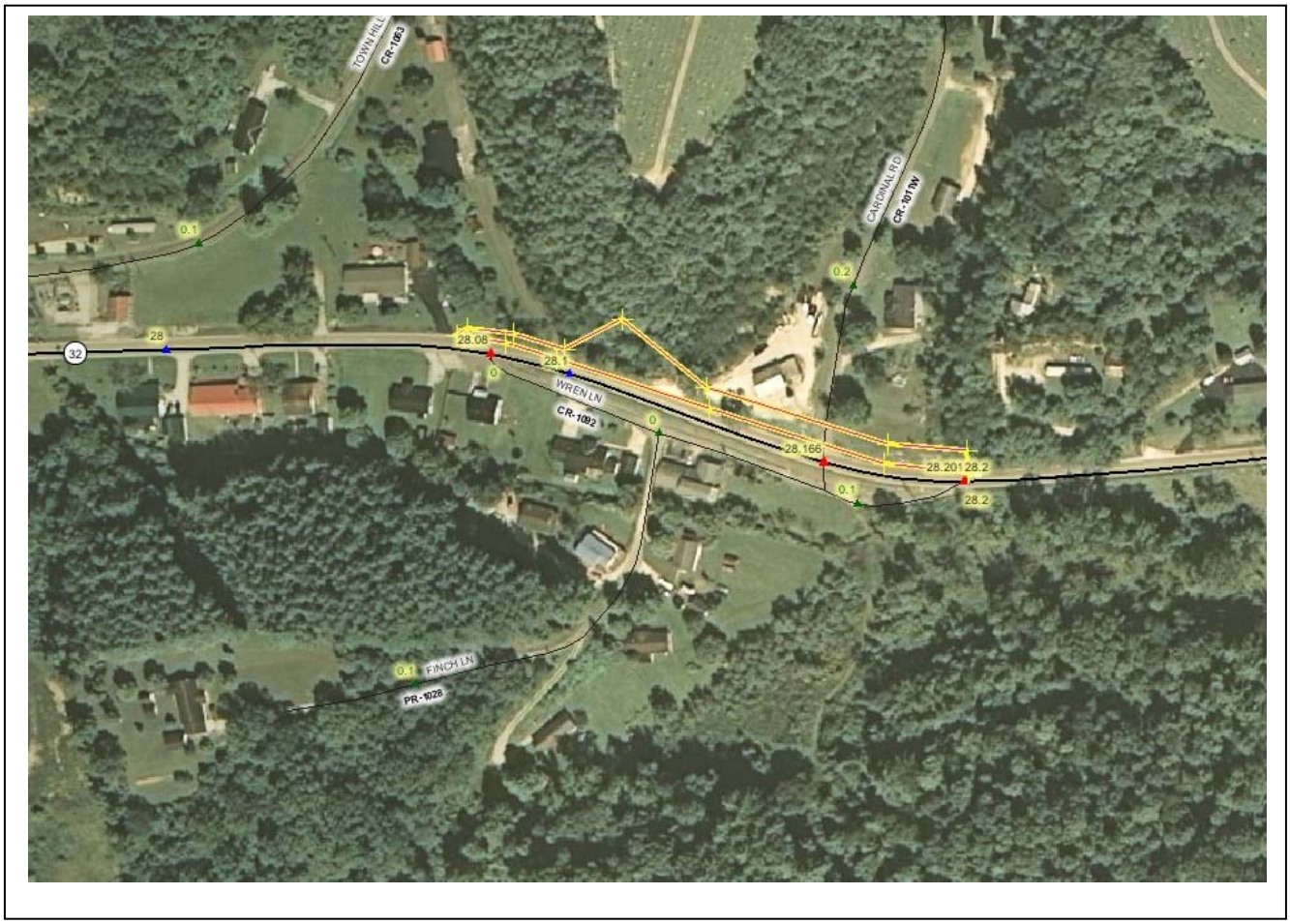


Figure 8:, Improve Sight Distance and Widen KY32a

Reconstruction of KY 32 from MP 28.1 to 28.08 (Segment B)

Other improvements to the remainder of Section One (Segment B) would be to create a paved shoulder for mail delivery at the Mail Pedestal at MP 28.07. Shoulder improvements may be considered along this segment as well for pedestrians and bicycles. However, shoulders greater than 3 feet will impact existing open channel drainage, utilities and property. The estimated cost for Segment B of Section One is $625,000 dollars.

Photos 5 & 6: Turn out simulation for US postal pedestal

Reconstruction of KY 32 from MP 27.75 to 28.0 (Segment C)

A portion of Segment C, in the vicinity of MP 27.9 can become flooded. In 1996, KYTC replaced a culvert at MP 28.7 which included some channel improvement. Only recently has flooding on the roadway become prominent. The photo (below) was taken in 2006 and since then, the site south of KY 32 has become a Walmart. The yellow arrow highlights a significant drain from that site. The existing branch channel (blue line) conveys water behind the present BP station. In the figure below, the shaded area (orange) generally represents an estimate by District 12 of the area which floods during heavy rain events.

Figure 9: Hydrologic improvements versus Roadway Elevation

It appears that siltation of the branch channel has reduced flow capacities. A hydrologic and biologic study is needed to determine the capacity of the branch and any biologic impacts the primary sources of runoff to the branch. During a site visit, an option was proposed to raise the roadway elevation. Elevating the roadway may alleviate standing water issues and would improve vertical cover for any existing or proposed culverts. However, this alternative has the potential negative impact of increasing the severity of flooding to homes in the area as well as the BP station. Before proceeding with raising the roadway, the Divison of Water should be consulted and an assessment of the source of excessive waters should be pursued. The estimated cost for a study is $15,000 dollars.

vi. Reconfigure KY32 and Town Hill Road intersection

Town Hill Road currently approaches KY32 at a skew 70 degrees from perpendicular. As a result, vehicles on Town Hill Road must stop beyond an existing stop sign. The intersection is also adjacent to a stand of cattails suggesting a wetland condition. Traffic eastbound on KY32 are able to make a high speed left turn to Town Hill Road raising the risk for crashes with injuries.

By constructing about 250 feet of new road, Town Hill Road can be reconfigured to turn for a perpendicular intercept of KY32 just west of an existing electric substation. The area is virtually un-developable because of the skew of Town Hill Road. Adequate separation exists to avoid the wetland area and provide good sight distance in both directions of KY32. An existing culvert underneath KY32 may be impacted along with any underground utilities. One utility pole may need relocation as well. The estimated cost for this section is about $250,000 dollars.

Figure 10: Option 1, Town Hill Road Re-alignment

Reconstruction of KY 32 and Town Hill Road (continued)

A second alternative would construct 350 feet of Town Hill Road to the east side of a maintenance building owned by the electric utility. This route would potentially impact at least two utility poles. The purchase of the right-of-way would impact a potential residential lot since sewer is available in the area. The estimated cost for this section is about $360,000 dollars.

Figure 11: Option 2, Town Hill Road Re-alignment

b. Cost Estimates

		✓	Planning	Design	ROW	Utilities	Construction	Total Cost
Task i								
	Option 1A			N/A	N/A	N/A	N/A	N/A
	Option 1B	✓		$60,000	$250,000	$100,000	$600,000	$1,010,000
	Signal Head			$0	$0	$0	???	$0
	Option 2			$10,000	$0	$0	$25,000	$35,000
Task ii								
	Section 2	✓					$66,000	$66,000
Task iii								
	Option 1			$10,000	$20,000	$25,000	$40,000	$95,000
	Option 2	✓		$60,000	$250,000	$120,000	$540,000	$970,000
Task iv								
	Option 1	✓		$140,000	$320,000	$550,000	$1,000,000	$2,010,000
	Tiii O_2 credit	✓		-$60,000	-$135,000	-$25,000	-$45,000	-$265,000
	Option 2			$180,000	$420,000	$850,000	$1,600,000	$3,050,000
Task v	✓ Total			$90,000	$220,000	$380,000	$900,000	$1,590,000
	Segment A	✓		$55,000	$130,000	$230,000	$550,000	$965,000
	Segment B	✓		$35,000	$90,000	$150,000	$350,000	$625,000
	Segment C		$ 15,000	$110,000	$280,000	$470,000	$1,100,000	$1,975,000
Task vi								
	Option 1			$25,000	$60,000	$20,000	$150,000	$255,000
	Option 2	✓		$35,000	$85,000	$30,000	$210,000	$360,000
Total of Checked Items		✓		$385,000	$1,125,000	$1,180,000	$3,250,000	$5,940,000
	Budgetted			$500,000	$1,500,000	$1,000,000	$4,500,000	$7,500,000

☑ Check marks are not recommendations, but rather possible choices given the available funding

V. PUBLIC AND AGENCY COORDINATION

a. Public Involvement

Since this project proposes to you Federal Funds, public involvement must be included. The project team will need to seek the input of the public through meetings and determine which options create minimized adverse impacts.

b. Agency Coordination

The estimates included in this report were prepared by District 12 in 2010. A project development team meeting was held at the district office on June 29, 2010. The minutes of this meeting can be review in Appendix G. Consultation with the Division of Water needs to occur to determine the source and possible solutions to roadway flooding along a portion of Section 1. An environmental assessment (EA) needs to be conducted to determine if all or a part of this project meetings a Catagorical Exclusion (CE). A finding of no significant impact(FONSI), issued by EPA may be needed.

c. Utilities

Based on preliminary contacts, the following are contacts for existing utilities:

Water

Louisa Water Co.
PO Box608, 35 Jay Lane
Louisa, KY 41230
Phone: (606)638-4500 or (606)464-0253
Contact: David McQuire

Gas

Columbia Gas
Mercer Road
Louisa, KY 41230
Phone: (859)288-0253/ c(859)221-2185
Contact: Brian Sloan
E-mail: bkslone@nisource.com

Sewer

Lawrence County Sewer District
P.O. Box 566
Louisa, KY 41230
Contact: David Compton, Co Judge Exec

Electric

Kentucky Power Company (formerly AEP)
12333 Kevin Street
Ashland, KY 41102
Phone: (606)929-1474/ c: (606)831-2307
Contact: Pat Thovson
E-mail: pathovson@aep.com

Cable

LYCOM Communications, Inc
Steve Lycans
P.O. Box 1114
Louisa, KY 41230
Phone: (606)638-0640
E-mail: steve@lycomonline.com

Telephone

ATT of Kentucky
29 Willis Branch Road
Prestonsburg, KY 41653
Phone: (606)871-2715/ c(606)424-9328
E-mail: jack.salyer@bellsouth.com

VI. CONCLUSIONS AND NEEDS

a. Preliminary Environmental Conclusion

Construction is currently budgeted in FY2011 to utilize Federal Statewide Program Funds (STP). Therefore, a National Environmental Protection Agency (NEPA) document will be required.

b. Project Conclusion

During the Project Development meeting the team agreed that improvements are needed in the curve section of KY 32 from approximately 28.0 to 28.466. The forecasted traffic volumes review that the volume of vehicles will increase through this section from 3,200 to 5,200 vehicles per day by 2030. While capacity and the critical rate factor for crashes along the corridor are below thresholds, the intersections within this project have been identified as needing improvement. Some alternatives in this report exceed the budgeted amounts. Other alternatives will require public input, while some alternatives propose to employ operational or maintenance solutions. Ultimately, this project has the potential to meet the needs of the community into the foreseeable future through improved safety, mobility, and connectivity.