



Prepared for:



Prepared by:



KY 194 / KY 632

CORRIDOR STUDY

SUMMARY

Pike County, Kentucky

January 2014

1.0 KY 194/KY 632 Corridor Overview

This corridor planning study is to identify and evaluate improvements on KY 194 from US 119 southeast to KY 632 in Kimper, and on KY 632 from KY 194 in Kimper, east to KY 194 in Phelps, in Pike County. This study includes an inventory of existing conditions, establishing project purpose and goals, proposing and analyzing alternate improvement options, developing practical solutions and cost estimates for viable construction sections, conducting public involvement activities throughout the study process, prioritizing improvements, and writing a technical report to document the study process and results.

1.1 Project History

The KY 194/KY 632 corridor has been a topic of discussion in the area and within the Kentucky Transportation Cabinet (KYTC) for years. There is currently an active reconstruction project (Item Number 12-281.00) on KY 194 from just east of the Kellogg factory beginning near Deskins's Branch Road from MP 21.3 to just beyond MP 22. Item Number 12-940.00 added high friction surface to KY 194 from MP 18.4 to MP 19.0. There have also been five Project Information Sheets (PIFs) completed along the corridor to address various deficiencies and safety issues (four along KY 194 and one on KY 632 from Kimper to Phelps). In the early 1980s, three locations along KY 632 were constructed with passing opportunities along the corridor. Those locations are shown in Table 1.

1.2 Project Goals

The primary and initial goal of the project is to improve KY 194 from US 119 to just beyond the Kellogg Plant. The overall planning study goal is to study a complete reconstruction for the corridor, then focus on spot improvements. The corridor was divided into segments approximately five-mile in length, with an initial focus from US 119 to the Kellogg Factory. The ultimate typical section matches the typical section for Item Number 12-281.00 and has 12-foot lanes and 6-foot paved shoulders (refer to Exhibit 2). The desired design speed is 55 mph for the complete reconstruction alternative, and 40-mph for the spot improvements (Figure 2). The following are the approximate 5-mile segments:

Table 1: Roadway Sections

Section	Beg MP Description	Beg MP	End MP	Ending MP Description
1	US 119	18.0	21.3	Beginning of Item Number 12-281.00
2	End of Item Number 12-281.00	22.0	26.670	KY 632
3	KY 194/KY 632	26.760	4.034	KY 1758
4	KY 1758	4.034	10.459	KY 3419
5	KY 3419	10.459	14.019	KY 194

1.3 General Purpose and Need

The purpose of this project is to improve safety, mobility, and connectivity for travelers along the KY 194.KY 632 23-mile corridor from US 119 to Phelps in Pike County. Both KY 194 and KY 632 are classified as rural minor arterials. This corridor provides a vital connection for those travelers from Phelps and areas further east to US 119, and on to Pikeville.

2.0 Review and Summarization of Previous Work

2.1 Project Information Forms (PIFs)

In the planning process, KYTC has developed five PIFs, four on KY 194, and one on KY 632. Each have a recurring theme of substandard geometrics, narrow two-lane roadway with virtually no shoulders, sharp curves, and steep grades. There are also heavy coal trucks from various mines, and high crash rates. Table X provides a summary and location of those PIFs, together with a description of the improvement and a year 2008 cost estimate. Each of these PIFs have been on record since year 2000.

Table 2: Project Information Forms

PIF #	Beg MP	End MP	Length (miles)	Description	Last Update	Total Cost (millions \$)
12 098 D0194 65.10	17.08	19.99	2.9	Improve from KY 194 from KY 2169 to Mountain Top Bakery	June 9, 2008	12.5
12 098 D0194 65.30	21.5	22.2	0.7	Safety improvements for curve 2.5 miles south of Bevins Branch	June 5, 2008	17.6
12 098 D0194 65.40	24.2	25.1	0.9	Improvements for curve at Stinking Branch near Deskins Branch	June 5, 2008	9.5
412 098 D0194 65.40	26.1	27.1	1.0	Address safety concerns and substandard geometrics from the RR Xing 0.15 miles before Hurricane Creek to 0.5 miles beyond the junction of KY 194 and KY 632	June 5, 2008	4.4
12 098 D0632 1.00	0.0	14.0	14.0	Address service, condition and safety issues on KY 632 from KY 194 to Phelps	June 9, 2008	100.0

2.2 Opportunities for Passing

In the mid 1980's, opportunities for passing were added to KY 632 at essentially three locations. Those locations are listed in Table 3.

Table 3: Passing Opportunities

Route	Beginning Milepoint	Ending Milepoint
KY 632	3.05	3.50
KY 632	7.02	8.182
KY 632	11.932	12.230

2.3 KYTC Item Number 12-281.00

Currently, KYTC has an active reconstruction project known as Item Number 12-281.00 on KY 149 from just east of the Kellogg factory beginning near Deskins's Branch Road from MP 21.3 to just beyond MP 22. This project is a 40 mph design speed spot improvement and is shown in Exhibit X.

2.4 KYTC Item Number 12-940.00

In an effort to improve safety along KY 194, KYTC Item Number 12-940 added high friction surface from MP 18.4 to MP 19.0.

3.0 Existing Corridor Inventory – SHORT FACTS

- Rural Minor Arterials.
- Length – 22.7 miles
- **Current ADT:**
 - 5,800 US 119 to Bevins Branch
 - 4,900 from Bevin's Branch to KY 632
 - 3,000 from KY 632 to KY 3419
 - 4,600 from KY 3419 to KY 194
- **Projected 2040 ADT:**
 - 9,000 US 119 to Bevins Branch
 - 7,300 from Bevin's Branch to KY 632
 - 4,500 from KY 632 to KY 3419
 - 7,000 from KY 3419 to KY 194
- **Coal Haul** - Carries over 3 million tons of coal, 2 million of that is in the first section from US 119 to McCoy Elkhorn entrance. There are also large semi-tractor trailers carrying coal equipment in and out of the coal operations.
- **Lane widths** - range from 10 to 11 feet wide with a varying average shoulder width of two to four feet. In some instances, that shoulder has completely broken away and has required stabilization.

- **Speed Limit** for the majority of the corridor is 55 mph except approaching the last ½ mile into Phelps which is 35 mph.
- **Crashes** - a total of 212 crashes reported from the Kentucky State Police Collision Database occurring within the corridor including three fatality crashes. Crash analysis reveals the following patterns for the corridor:
 - Over 73% involved curves
 - 6 head on crashes,
 - 64% involve two or more vehicles,
 - 39% injuries,
 - 63% during the daylight,
 - 55% wet pavement,
 - 40% ran off the roadway,

- **Substandard Horizontal and Vertical Alignment**

There were gaps in existing plans, however that were readable the

- **Vertical** - KY 632 between Pond Fork and Blackberry Fork (MP 6.6 and MP 8.1) there are several vertical grades that exceed minimum criteria for both 55 and 40 mph design speed criteria for (9%, 7% and 6.76%), and 16 areas that do not meet the minimum stopping sight distance for 40 mph, 36 locations do not meet 55 mph.
- **Horizontal Curves** – although some of the route's existing plans are unreadable, there are approximately 15 locations that do not meet the current minimum radius criteria for 40 mph, and 57 locations that do not meet the current minimum radius criteria.
- **Safe Passing** for only 11.4% of the corridor
- **Major Industry**
 - **Kellogg Factory** employs 370 employees with 24/7 shifts having 60 to 70 trucks per week
 - **McCoy Elkhorn** - has 300 to 500 trucks daily that travel KY 194 to their facility just east of KY 119.
 - **High Ridge Mining**
 - **SNF Flomin Coal** at Kimper
- **Schools**
 - Youth Services Center
 - Phelps Area Technical Center

- Phelps Elementary School
- Phelps High School
- Kimper Elementary
- **Constraints**
 - John's Creek runs alongside much of the corridor
 - Railroad parallels the corridor and crosses the corridor
 - Coal conveyors crossing the corridor
 - Terrain and large rock cuts
 - Some development close to the road
-

3.0 Proposed Design Criteria

Table 4: Proposed Design Criteria

Category	Criteria	
Design Speed	40 mph	55 mph
Minimum Horizontal Radius	465'	965'
Maximum grade	8.0	6.0
emax	8%	8%
SSD	405'	495'

4.0 Section 1 – US 119 to MP 18 to MP 21.3 (beginning of Item No. 12-281.00)

4.1 Crashes

- The entire section has a Critical Rate Factor that exceeds 1.0 indicating that crashes may not be occurring at random and there are multiple 0.1 mile spots that exceed a CCRF of 1.0 for spots. For a three-year period (2010-2012) One 0.1 mile spot had 10 crashes between MP 18.8 and 18.914.
- 65 crashes
- 1 fatal
- 21 Injury

4.2 Deficiencies

There were unreadable plans from MP 18-19.3 what is readable has:

- Vertical Curves that do not meet current Stopping Sight Distance Criteria
 - 2 that do not meet 40 mph
 - 4 that do not meet 55 mph
- Horizontal Curves that exceed current horizontal radius criteria
 - 11 that do not meet 55 mph

4.3 Constraints Affecting Alignment

- US 119 ramp any improvements on the north side, the cut slopes encroach on the ramps to and from NB US 119 to KY 194.
- Large conveyor in front of McCoy Elkhorn that clearance must be maintained with huge
- Stockpile of Coal that is a fixed area and cannot be moved
- Ventilation Building that is fixed and cannot be moved
- Floodway and Floodplain
- Maximum horizontal curve
- Utilities
- Major transmission Line crossing near the Kellogg Factory
- Substation just west of the Kellogg Factory
- Maximum horizontal radius of 960'

5.0 Alternatives

Section 1 – Total Reconstruction and Shoulder Widening - \$11,754,000

Beginning at approximately MP 18.0 to MP X with widening shoulders four feet, then just past the rock wall on the north side of the road, at MP X, widening to 12-foot lanes and 6-foot paved shoulders to approximately MP 21.3 which is the beginning of Municipal's section that is currently in the r/w phase. This alternative provides for

- Right turn lane at main McCoy Elkhorn
- Right turn lanes at the westernmost and easternmost entrances of the Kellogg Plant,
- Left turn lane at the easternmost entrance to the Kellogg Plant
- Westbound passing between Stations 46+50 (leaving McCoy-Elkhorn stockpile and hillside to the north) and the bridge over John's Creek at 66+50. This will complement the proposed eastbound passing lane proposed as a part of Municipal's project (Item Number 12-281.00).

Impacts

- Right of Way Impacts
 - McCoy Elkhorn Minerals Lab

- McCoy Elkhorn Helipad
- Possible Oil Well lines impact (#CF-2)
- Environmental
 - Archaeology Site that is in between the McCoy Elkhorn stockpile and the Kellogg Factory that will have to be assessed for historic eligibility
 - 11 structures over 50 years old that will have to be assessed for their eligibility to the National Register of Historic Places
 - Scrub Shrub (wetland) habitat that will require mitigation
 - Indiana and Gray Bat habitat
 - Floodway/floodplain

Spot Improvement 1 - \$ 3,006,000

Widen shoulder to 4-foot-wide paved shoulders from MP 18.0 to MP 18.7.

Spot Improvement 2 - \$776,500

Improve Sight Distance and substandard geometrics at Bevin's Branch Road from approximately MP 18.8 to MP 19.2.

Spot Improvement 3 - \$3,131,300

Improve Substandard Geometrics and Improve Safety at Kellogg Plant Improvement from approximately MP 20.0 to MP 20.6 includes:

- Realigns roadway to the north providing for 12 foot lanes and 6 foot shoulders
- Right and left turn lanes into the easternmost and westernmost entrances
- Provides for a left turn lane into the easternmost employee entrance

Table 5 ESTIMATE OF COST

			Reconstruction		Spot Improvements						
					Spot 1		Spot 2		Spot 3		
Item	Unit	\$ Unit Cost	ALTERNATE 1 - Full		Shoulder Widening		Bevin's Branch		Kellogg Plant		
			Quantity	Cost (\$)	Quantity	Cost (\$)	Quantity	Cost (\$)	Quantity	Cost (\$)	
Length			2.3 miles		0.66 mile		0.42 mile		0.66 mile		
CONSTRUCTION											
Pavement	SY	60	57,000	3,420,000	11,200	672,000	5,250	315,000	16,000	960,000	
Earthwork Alt 1	CY	5	773,000	3,865,000							
Earthwork Spots	CY	7			201,000	1,407,000	31,500	220,500	172,000	1,204,000	
Structures	LF	16		0		0	90	1,400	90	1,400	
Bridges	SF	80	13,000	1,040,000		0		0		0	
Retaining Walls	SF	70		0		0		0		0	
Drainage 3%	3%			250,000		62,000		16,100		65,000	
MOT 0.5%	0.50%			43,000		11,000		2,800		11,200	
UTILITIES	2%			172,000		43,000		11,100		44,600	
RIGHT OF WAY				0		0		0		0	
Sub-Total				8,790,000		2,195,000		566,900		2,286,200	
Miscellaneous (25% excluding Bridges)				1,895,000		538,000		139,000		560,400	
Sub-Total				10,685,000		2,733,000		705,900		2,846,600	
Contingencies (10%)				1,069,000		273,000		70,600		284,700	
TOTAL				11,754,000		3,006,000		776,500		3,131,300	

Note: Total Cost Estimates do not include R/W estimates at this time.

ESTIMATE OF COST (POST PROJECT TEAM MEETING #1)

Item			Reconstruction		Spot Improvements					
					Spot 1		Spot 2		Spot 3	
					Shoulder Widening		Bevin's Branch		Kellogg Plant	
Unit	\$		Quantity	Cost (\$)	Quantity	Cost (\$)	Quantity	Cost (\$)	Quantity	Cost (\$)
Length			2.30 miles		0.63 mile		0.35		0.70 mile	
			Beg MP	End MP	Beg MP	End MP	Beg MP	End MP	Beg MP	End MP
			18.68	20.98	18.06	18.68	18.8	19.15	19.82	20.52
DESIGN	10%		*	\$ 2,000,000		\$ 217,000		\$ 100,000		\$ 224,000
CONSTRUCTION										
Pavement	SY	60	57,000	\$ 3,420,000	11,200	672,000	5,250	315,000	16,000	960,000
Earthwork Alt 1	CY	6	773,000	\$ 4,638,000						
Earthwork Spots	CY	7			201,000	1,407,000	31,500	220,500	172,000	1,204,000
Structures	LF	16		\$ -		0	90	1,400	90	1,400
Bridges	SF	120	13,000	\$ 1,560,000		0		0		0
Retaining Walls	SF	70		\$ -		0		0		0
Drainage	3%			\$ 289,000		62,000		16,100		65,000
MOT	1.52%			\$ 150,000		32,000		8,400		11,200
ENVIRONMENTAL IN LIEU FEES	FT	\$ 300	340	\$ 102,000	0	0	77	23,100	0	0
UTILITIES*	0			\$ 1,500,000		\$ -		0		0
RIGHT OF WAY*	0			\$ 2,000,000		\$ -		0		0
Sub-Total				\$ 15,659,000		2,173,000		584,500		2,241,600
Miscellaneous (25% excluding Bridges and R/W and Utilities)				\$ 2,150,000		543,000		146,100		560,400
Sub-Total				\$ 17,809,000		2,716,000		730,600		2,802,000
Contingencies (10%)				\$ 1,781,000		272,000		73,100		280,200
TOTAL				\$ 19,590,000		2,988,000		803,700		3,082,200

*Provided by KYTC



Manner of Collision

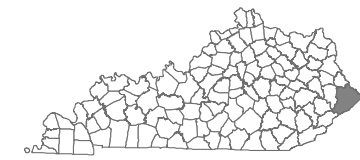
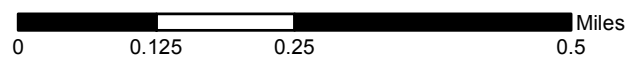
- Angle
- Backing
- * Head On
- ▲ Opposing Left Turn
- Rear End
- ◆ Sideswipe
- Single Vehicle

— KY Route

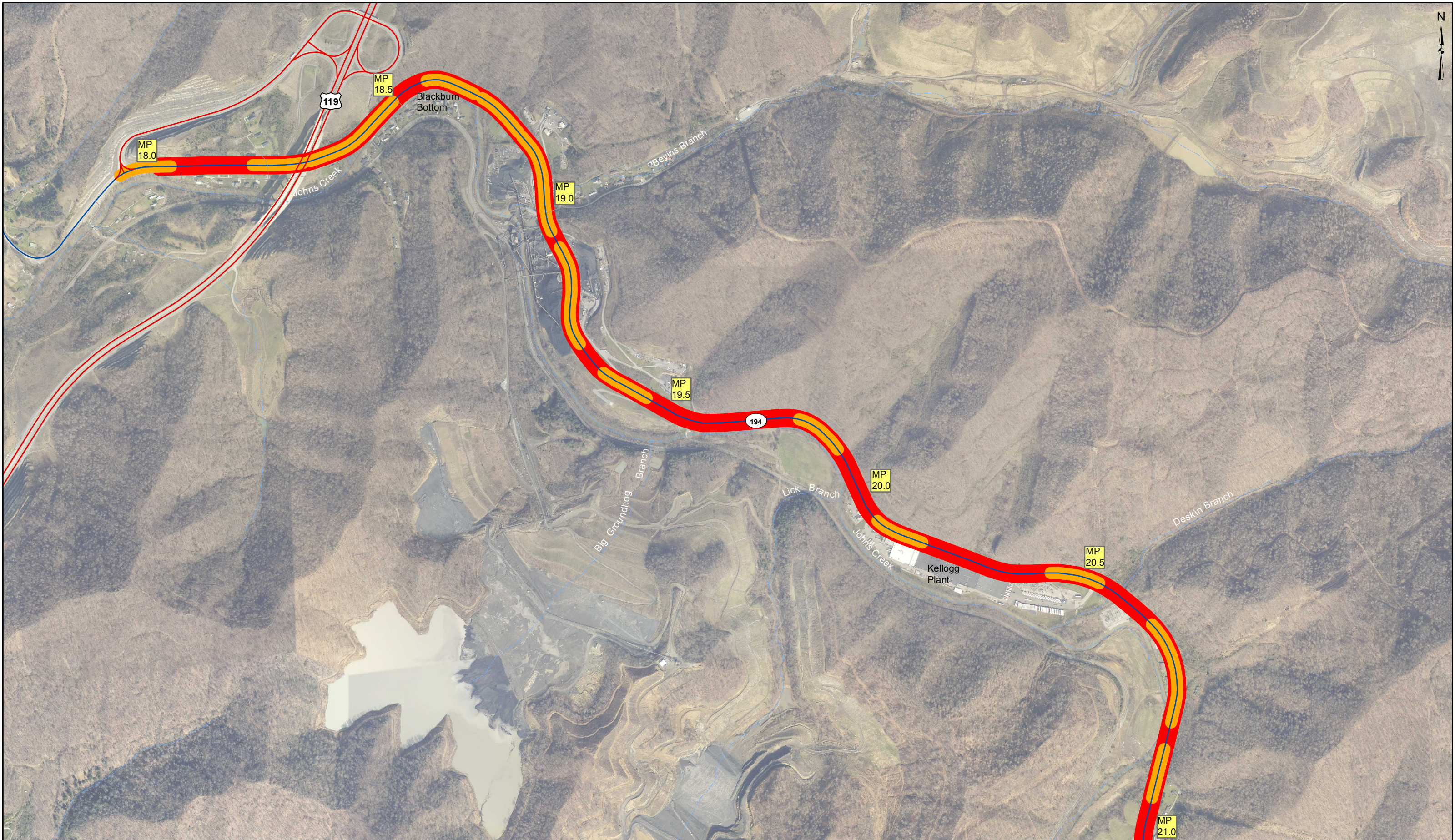
— US Route


— Local Road


— Streams





2010-2012 Crash Data Section 1
KY 194/KY 632
US 119 to Phelps, KY
Pike County





 .10 Mile Crash Spots

 Crash Segments

 Streams

 KY Route

 US Route

 Local Road


0

0.125

0.25

0.5

Miles



2010-2012 Crash Data Section 1

KY 194/KY 632

US 119 to Phelps, KY

Pike County



Vertical Curve

Does not Meet 40 mph

Does not Meet 55 mph

Horizontal Curve

Does not Meet 40 mph

Does not Meet 55 mph

In Section 1, as-built plans from approximately MP 18.0 to MP 19.3 are unreadable.

0

0.125

0.25

0.5

Miles

Horizontal and Vertical Geometrics Section 1

KY 194/KY 632

US 119 to Phelps, KY

Pike County



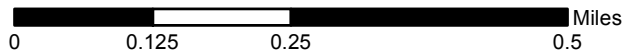
Spot Improvement 1 - Shoulder widening to 4 foot paved shoulders

Spot Improvement 2 - Improve sight distance at Bevin's Branch Road

Spot Improvement 3 - Reconstruct from near MP 20.0 to approximately MP 20.6 to improve substandard geometrics, improve sight distance and provide for right turn lanes at both entrances and left turn at eastern most entrance

— Spot Improvement

- - - Disturbed Limits



Recommended Spot Improvements Section 1

KY 194/KY 632

US 119 to Phelps, KY

Pike County

