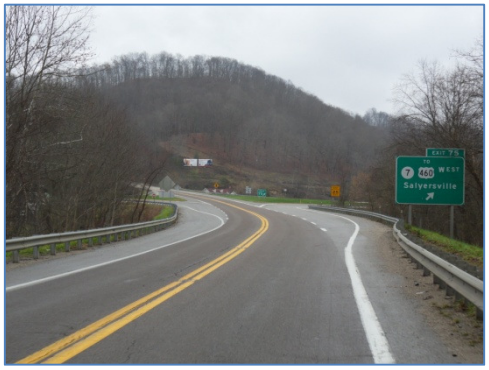
FINAL EXECUTIVE SUMMARY: September 2010
Mountain Parkway Extension (KY 9009)/US 460/KY 114 Programming Study
Wolfe, Morgan, Magoffin, and Floyd Counties

Purpose of Programming Study

This study builds on and incorporates information from previous studies, environmental documents, and design plans completed for various segments of the corridor. The study is not intended to make recommendations. Instead, the study is a review, compilation, update, and enhancement of previous work into a single source of information about the proposed widening of the Mountain Parkway Extension, US 460, and KY 114 in Wolfe, Morgan, Magoffin, and Floyd counties. It is intended to help the KYTC make an informed programming decision about proposed future improvements to the corridor.



Mountain Parkway Extension Exit 75

Corridor Segments

For the purpose of this study, the Mountain Parkway Extension (KY 9009)/US 460/KY 114 corridor is divided into "Corridor Segments" that are currently considered as Sections of Independent Utility (SIUs). The following Corridor Segments are displayed in **Figure 1**.

- Segment 1A (Campton Safety Project currently under construction)
  - KY 9009, MP 42.4 - MP 45.8, Wolfe County
- Segment 1B (Campton to Helechawa)
  - KY 9009, MP 45.8 - MP 56.6, Wolfe County
- Segment 2A (Helechawa to Salyersville)
  - KY 9009, MP 56.6 - MP 57.7, Wolfe County
  - KY 9009, MP 57.7 - MP 63.1, Morgan County
  - KY 9009, MP 63.1 - MP 73.6, Magoffin County
- Segment 2B (Salyersville)
  - KY 9009, MP 73.6 - MP 75.6, Magoffin County
  - US 460, MP 12.5 - MP 14.6, Magoffin County
  - KY 114, MP 0.0 - MP 0.3, Magoffin County
- Segment 3 (Salyersville to KY 404 near Prestonsburg)
  - KY 114, MP 0.3 - MP 5.0, Magoffin County
  - KY 114, MP 0.0 - MP 9.4, Floyd County

Purpose and Need

The potential widening of the Mountain Parkway Extension (KY 9009), US 460, and KY 114 between Campton and KY 404 near Prestonsburg involves a number of individual projects. The proposed improvement to each Corridor Segment can stand on its own merit with a unique Purpose and Need. Generally, the primary purpose of each of the segments is to provide additional capacity due to anticipated increases in future traffic demand and to improve level of service and safety by correcting roadway deficiencies.

While each Corridor Segment is considered a Section of Independent Utility, the improvement of all segments of the corridor also meets a greater regional purpose and need.

Corridor Segment/ Construction Section	Total Construction Section Cost (2010 Dollars) (Cost in Millions for "Full Design")
Segment 1B	**$131.5**
Section 1B-1	$30.2
Section 1B-2	$34.2
Section 1B-3	$32.2
Section 1B-4	$34.9

Corridor Segment/ Construction Section	Total Construction Section Cost (2010 Dollars) (Cost in Millions for "Full Design")
Segment 2B (1999 Design)	**$140.3**
Segment 2B (2004 Design)	**$106.0**
Segment 2B (Through Salyersville)	**$57.4**

Corridor Segment 1A

Corridor Segment 1B

Corridor Segment 2A

Corridor Segment 2B

Corridor Segment 3

Corridor Segment 1A is currently under construction.

1B-1 1B-2 1B-3 1B-4 2A-1 2A-2 2A-3 2A-4 2A-5 2A-6 2B 3-1 3-2 3-3 3-4 3-5 3-6

WEST LIBERTY

MORGAN

MAGOFFIN

JOHNSON

PAINTSVILLE

HELECHAWA

BERT T. COMBS MOUNTAIN PARKWAY

SALYERSVILLE

CAMPTON

WOLFE

FLOYD

PRESTONSBURG

LEE

JACKSON

KNOTT

Corridor Segment/ Construction Section	Total Construction Section Cost (2010 Dollars) (Cost in Millions for "Full Design")
Segment 2A	**$233.6**
Section 2A-1	$39.3
Section 2A-2	$40.8
Section 2A-3	$18.7
Section 2A-4	$43.1
Section 2A-5	$52.4
Section 2A-6	$39.3

Corridor Segment/ Construction Section	Total Construction Section Cost (2010 Dollars) (Cost in Millions for "Full Design")
Segment 3	**$234.2**
Section 3-1	$31.5
Section 3-2	$36.9
Section 3-3	$26.5
Section 3-4	$48.1
Section 3-5	$56.9
Section 3-6	$34.3

Corridor Segments

Proposed Construction Sections

KENTUCKY TRANSPORTATION CABINET

WilburSmith

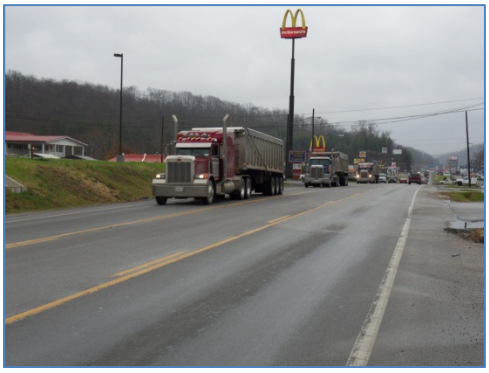
Mountain Parkway Extension / KY114 Programming Study
Campton to Prestonsburg

Figure 1 - Proposed Construction Sections

The overall regional purpose of the proposed widening of the Mountain Parkway Extension, US 460, and KY 114 is to improve highway access, connectivity, mobility, and safety from I-64 to other Appalachian Corridors, including Appalachian Corridors I (KY 15), B (US 23), F (US 25E/US 119), G (US 119), and Q (US 460), as well as the many communities and rural areas of this economically disadvantaged region in Southeastern Kentucky.

The need for the improvement to this regional corridor is due to the following characteristics and deficiencies:

- The presence of highway deficiencies, including:
  - Substandard roadway geometry
  - Functionally obsolete bridge structures
  - Maneuverability and passing limitations
- An estimated increase in future traffic and truck traffic volumes and subsequent reductions in level of service
- The presence of high crash locations
- High unemployment and poverty rates in Eastern Kentucky



US 460 in Salyersville

Design Assumptions

Various design options were evaluated for each Corridor Segment. All design assumptions (and costs) for the Mountain Parkway Extension (KY 9009)/US 460/KY 114 Corridor are shown in **Table 1.**

Concerns about frequent collisions with wildlife should be addressed in future phases of project development. However, cost estimates to provide special design features for wildlife crossings, barriers, or other measures to address this problem have not yet been determined in this study.

Estimated Costs

In most cases, cost estimates for the proposed widening of KY 9009 were developed in previous studies to varying degrees of detail. For this programming study, those previous cost estimates were inflated to current dollars using a 2.5% annual inflation factor. Cost estimates were developed if no previous cost estimates had been completed previously. Cost estimates are subject to change in future phases of project development.

The total costs of proposed improvements to the Mountain Parkway Extension (KY 9009)/US 460/KY 114 Corridor range from $620 to $742 Million. Cost details and project data are shown in **Table 1**, and a summary of totals by Corridor Segment are shown in **Table 2**.

Cost estimates are not included for Corridor Segment 1A which is currently under construction. Also, cost estimates are not shown for “Practical Solution 1” along the existing route through Salyersville for Corridor Segment 2B, which the Project Team determined does not meet the Purpose and Need for this Corridor Segment.

The costs shown in **Table 1** and **Table 2** do not reflect potential cost savings that could result from bifurcation, but information on this issue was developed for each Corridor Segment and is included in the study report to assist KYTC decision-makers.

Table 1
Design Assumptions & Cost Estimates
Mountain Parkway Extension/US 460/KY 114 Programming Study

	Mountain Parkway (Campton to Heleechewa)			Mountain Parkway (Helecheewa to Salyersville)			US 460 (Salyersville)			KY 114 (Salyersville to KY 404 near Prestonsburg)		
	Corridor Segment 1B			Corridor Segment 2A			Corridor Segment 2B			Corridor Segment 3		
	Full Design	Practical Design 1	Practical Design 2	Full Design	Practical Design 1	Practical Design 2	Full Design A	Full Design B	Practical Design	Full Design	Practical Design 1	Practical Design 2
	(KYTC 1998 Design)	(Reduced Typical Section)	(Reduced Design Speed & Typical Section)	(KYTC 1999 & 2007 Design)	(Reduced Typical Section)	(Reduced Design Speed & Typical Section)	KYTC 1999 Design	KYTC 2004 Design Plus New Connection to Segment 2A	"Through Salyersville"	(KYTC 1999 Design)	(Reduced Typical)	(Reduced Design Speed & Typical Section)
Design Controls												
Classification	Rural Parkway	Rural Parkway	Rural Parkway	Rural Parkway	Rural Parkway	Rural Parkway	Rural Arterial	Rural Arterial	Urban Arterial	Rural Arterial	Rural Arterial	Rural Arterial
Terrain	Mountainous	Mountainous	Mountainous	Mountainous	Mountainous	Mountainous	Rolling	Rolling	Level	Mountainous	Mountainous	Mountainous
Design Speed (Design Year Standards)	70 mph	70 mph	60 mph	70 mph	70 mph	60 mph	65 mph	65 mph	45 mph	60 mph	60 mph	55 mph
Design Speed (2010 Standards)	65 mph	65 mph	60 mph	65 mph	65 mph	60 mph	65 mph	65 mph	45 mph	60 mph	60 mph	55 mph
Access Control	Full Control	Full Control	Full Control	Full Control	Full Control	Full Control	Full Control	Full Control	Partial Control	Partial Control	Partial Control	Partial Control
ADT (Existing 2009)	3,790 vpd to 4,380 vpd			4,380 vpd to 6,650 vpd			KY 9009 6,650 vpd to 8,790 vpd, US 460/KY 114 12,000 vpd to 15,300 vpd, KY 114 6470 vpd			5,370 vpd to 11,900 vpd		
ADT (Future No-Build 2030)	4,600 vpd to 5,900 vpd			5,900 vpd to 8,100 vpd			KY 9009 8,100 vpd to 10,700 vpd, US 460/KY 114 14,600 vpd to 18,700 vpd, KY 114 7,900 vpd			5,600 vpd to 14,500 vpd		
ADT (Future With Improvement 2030)	5,200 vpd to 6,000 vpd			6,200 vpd to 9,100 vpd			US 460 16,400 vpd to 21,000 vpd			7,300 vpd to 16,300 vpd		
Typical Section												
Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes	Four 12-ft Lanes
Outside Shoulder	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)	Curb & Gutter, 5 ft berm & 5 ft sidewalk	12 ft (10 ft Paved)	12 ft (10 ft Paved)	12 ft (10 ft Paved)
Median	40 ft Depressed	14 ft Flush with Barrier	14 ft Flush with Barrier	40 ft Depressed	14 ft Flush with Barrier	14 ft Flush with Barrier	40 ft Depressed	40 ft Depressed	14 ft Raised with Turn Lanes as Needed	40 ft Depressed and 14 ft Flush	14 ft Flush with Barrier or Center Turn Lane	14 ft Flush with Barrier or Center Turn Lane
Existing Roadway Segment Length	10.8 miles	10.8 miles	10.8 miles	17.0 miles	17.0 miles	17.0 miles	5.6 miles	4.4 miles	4.4 miles	14.1 miles	14.1 miles	14.1 miles
Proposed Design Segment Length	10.8 miles	10.8 miles	10.8 miles	16.22 miles	16.22 miles	16.22 miles	5.3 miles	4.3 miles	4.4 miles	13.9 miles	13.9 miles	13.9 miles
Alignment												
emax	8%	8%	6%	8%	8%	6%	8%	8%	4%	6%	6%	6%
Min. Radius	1,480 ft	1,480 ft	1,330 ft	1,480 ft	1,480 ft	1,330 ft	1,485 ft	1,485 ft	711 ft	1,340 ft	1,340 ft	1,065 ft
Max Grade	6%	6%	7%	6%	6%	7%	4%	4%	6%	6%	6%	6%
Vertical Clearance	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft	16 ft
Preliminary Cost Estimates (in Millions) (in 2010 Dollars)												
Construction Cost	$113.1	$106.4	$104.1	$207.0	$184.2	$165.6	$119.8	$87.0	$45.5	$185.9	$172.8	$154.3
Design Cost	$11.3	$10.6	$10.4	$10.3	$9.2	$8.3	$6.0	$6.1	$4.6	$9.3	$8.6	$7.7
Utility Cost	$1.2	$1.2	$1.2	$1.8	$1.8	$1.8	$1.4	$1.5	$2.7	$6.2	$6.2	$6.2
ROW Cost	$5.8	$5.8	$5.8	$14.5	$14.5	$14.5	$13.0	$11.4	$4.7	$32.9	$32.9	$32.9
Total Cost	**$131.5**	**$124.0**	**$121.5**	**$233.6**	**$209.7**	**$190.2**	**$140.3**	**$106.0**	**$57.4**	**$234.2**	**$220.6**	**$201.0**
Preliminary Cost Estimates Per Mile (in Millions) (in 2010 Dollars)												
Construction Cost Per Mile	$10.5	$9.8	$9.6	$12.8	$11.4	$10.2	$22.6	$20.2	$10.3	$13.4	$12.4	$11.1
Utility Cost Per Mile	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.3	$0.4	$0.6	$0.4	$0.4	$0.4
ROW Cost Per Mile	$0.5	$0.5	$0.5	$0.9	$0.9	$0.9	$2.5	$2.7	$1.1	$2.4	$2.4	$2.4
Total Cost Per Mile	$12.2	$11.5	$11.3	$14.4	$12.9	$11.7	$26.5	$24.7	$13.1	$16.9	$15.9	$14.5

Table 2 – Cost Estimates

Corridor Segment	Length (Existing Roadway)	Cost Range
Corridor Segment 1A (Campton)	3.8 miles	$46 Million (Project Under Construction)
Corridor Segment 1B (Campton to Helechawa)	10.8 miles	$122 - $132 Million
Corridor Segment 2A (Helechawa to Salyersville)	17.0 miles	$191 - $234 Million
Corridor Segment 2B (Salyersville)	4.3 miles to 5.6 miles	$106 - $141 Million
Corridor Segment 3 (Salyersville to KY 404 near Prestonsburg)	14.1 miles	$201 - $235 Million

Proposed Construction and Priority Sections

Proposed construction sections and priority sections for the Mountain Parkway Extension/US 460/KY 114 Corridor are shown on **Figure 1**. The priority sections established by the Programming Study Project Team for the Mountain Parkway Extension/US 460/KY 114 corridor are as follows:

KYTC Highway District 10

1. Construction Section 2B
2. Construction Section 2A-3
3. Construction Section 2A-2
4. Construction Section 2A-6
5. Construction Section 2A-5
6. Construction Section 2A-4
7. Construction Section 2A-1
8. Construction Section 1B-4
9. Construction Section 1B-3
10. Construction Section 1B-2
11. Construction Section 1B-1

KYTC Highway District 12

1. Construction Section 2B
2. Construction Section 3-6
3. Construction Section 3-5
4. Construction Section 3-4
5. Construction Section 3-3
6. Construction Section 3-2
7. Construction Section 3-1

Funding Options

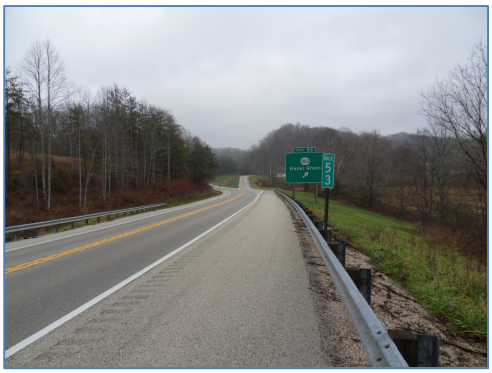
This programming study included an exploration of options for financing proposed improvements to help defray the costs of the proposed widening of the Mountain Parkway Extension/US 460/KY 114 Corridor between Campton and Prestonsburg, including a preliminary planning-level analysis to determine the approximate level of funds that could be generated from tolls.

Potential Funding Sources

Traditional revenue sources for funding proposed projects in the Mountain Parkway Extension/KY 114 study corridor include the following:

- National Highway System (NHS)
- Surface Transportation Program (STP) Funds

- Appalachian Development Highway System (ADHS) Funds
- Highway Safety Improvement Program Funds
- Bridge Replacement and Rehabilitation (BR) Program Funds
- Highways for LIFE
- Transportation, Community and System Preservation (TCSP) Funds
- Grant Anticipation Revenue Vehicles (GARVEE)
- Transportation Infrastructure Finance and Innovation Act (TIFIA) Funds
- State Road Fund
- State General Funds
- State Bonds



Mountain Parkway Extension Milepoint 53

KYTC options for providing the matching funds for federal funding include monies from the State Road Fund and General Fund, or the state may use Toll Credits. Other options that may offer potential funding for the Mountain Parkway Extension/US 460/KY 114 corridor in the future include:

- Establish a Transportation Authority or Infrastructure Authority (with the authority for imposing taxes or fees).
- Pursue Federal Legislation for Designation as a High Priority Corridor, with Special Earmarked Funding.

Tolling Analysis

One traditional source of funding is the use of State Bonds, which could perhaps be repaid in part by revenues from tolls collected from users of an improved Mountain Parkway Extension/KY 114 corridor. Analysis was undertaken to provide a sketch-level estimate of the potential revenues that might be collected from tolls. For this analysis, the corridor was divided into two tolling sections:

- Tolling Section 1 – Campton to Salyersville; and
- Tolling Section 2 – Salyersville to Prestonsburg.

The KYTC statewide travel demand model was used by WSA to analyze trip diversions and develop traffic forecasts to assess toll revenue potential. These are the key assumptions used in this analysis:

- Tolling Section 1 will be improved to become a 4-lane divided highway – 2 lanes in each direction with an average travel speed assumed to be 65 mph.
- Tolling Section 2 will become a 4-lane divided highway – 2 lanes in each direction with an average travel speed assumed to be 60 mph
- Tolls will be electronically collected in both directions and are based on miles traveled.
- 2016 is used as the year when improvements are completed and tolling will start.
- Year 2030 is used as the future traffic and revenue forecast year.
- All revenues are in constant 2009 dollars, i.e., no inflationary adjustments were made.
- Truck tolls were assumed to be 4 times the car rates.
- The same toll rates will be in effect at all hours of the day (i.e., no time-of-day variations).
- US Bureau of Census data was used to develop a Value-Of-Time (VOT) table at the traffic zone level. The average VOT for the analysis was $0.20/minute for all vehicles.

To balance the revenue versus the traffic served in 2016, the optimal rates used were $0.07/mile for Tolling Section 1 and $0.10/mile for Tolling Section 2. In 2030, the optimal rates are recommended to be $0.10/mile for Tolling Section 1 and $0.15/mile for Tolling Section 2.

Bonding Scenarios

Potential bonding revenues for each scenario were estimated for two different financial structures: (1) Standard Toll Revenue Bonds, Gross Revenue Pledge; and (2) General Obligation Bonds, Gross Revenue Pledge. Assumptions for the parameters for the calculation of the bonding capacity estimates are shown in **Table 3**.

Table 3 - Bonding Capacity Calculation Parameters

Type of Assumption	Standard Toll Revenue Bonds	General Obligation Bonds
Coverage Ratio	1.75	1.25
Interest Rate	5%	4%
Percentage of Net Proceeds Available for Construction Costs	87.5%	87.5%

Based on the analysis for these two bonding scenarios, the estimated Toll Revenue Pledge to help defray the cost of roadway improvements along the Mountain Parkway Extension/US 460/KY 114 corridor are as shown in **Table 4**.

Table 4 - Toll Revenue Pledge

Tolling Section(s)	Standard Toll Revenue Bonds ($ Million)*	General Obligation Bonds ($ Million)*
Tolling Section 1 Only	12.3	19.8
Tolling Sections 1 and 2 (Combined)	30.6	49.4

**NOTE: These revenues are preliminary estimates for planning purposes only. They consider toll collection and enforcement, but they do not consider roadway operations and maintenance costs, which would be borne by the Commonwealth of Kentucky. A more detailed tolling analysis would be needed if a decision is made to pursue toll collection along this corridor.*

Additional Information

Additional information regarding this Programming Study can be obtained from:

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