



Intersection Improvements at US 79

Location 1-D: KYTC Spot 1-2

Logan County, Milepoint 13.896

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Logan County</i>										
Location 1-D: Intersection with US 79/Russellville										
KYTC Spot 1-2/WSA Spot	13.795	13.896	1.08	0	0	Σ = 8	1.18	0	1	Σ = 11

Description:

This four-leg signalized intersection in Russellville currently links US 79, US 431, and the Russellville Bypass. Each quadrant has tight turning radii, with stop bars set back from the intersection to provide enough space for trucks to complete turning movements. A number of crashes occur at this intersection when vehicles stop in front of the stop bars and then must back up along the mainline to clear space for turning trucks. Businesses in three quadrants have continuous paved entrances; the fourth quadrant contains a cemetery and historic property. The eastern approach to this intersection leads to a historic neighborhood in Russellville.

With the designation of US 431 south of Russellville to the National Truck Network, the size and number of trucks traveling on US 431 between Tennessee and Russellville is likely to increase. The Kentucky State Police recommend widening the route to accommodate these vehicles. However, a southern extension of the Russellville Bypass will remove a large portion of through car and truck trips from the existing intersection. The bypass extension has allotted funding for right-of-way acquisition and utilities relocation in the 2006-2012 Six Year Plan. Reconstruction of the US 431/US 79 intersection is identified in the 2007 Unscheduled Projects List as a high priority by both the ADD and KYTC District. Additional information is available in the 1999 Russellville Urban Area Transportation Study.

Recommendations:

Improve radii and delineate commercial entrances at standard widths. Improvements to this intersection should be considered a lower priority than the Russellville Bypass Extension.

Cost Estimate:

Design \$ 100,000
Right of Way \$ 500,000
Utilities \$ 200,000
Construction \$ 500,000

Corridor for Russellville Bypass Extension



US 79 approach to intersection with US 431, facing west



Realign Segment at Hollow Bill

Location 1-G: KYTC Spot 1-4

Muhlenberg County, Milepoint 29.700-30.600

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Logan County</i>										
Location 1-G: Hollow Bill										
KYTC Spot 1-4/WSA Spot	29.952	30.100	1.62	0	2	Σ = 6	1.57	0	2	Σ = 11
WSA Spot	30.106	30.206	N/A				1.27	0	1	Σ = 5

Description:

This segment of roadway is composed of a series of reverse curves just north of H.W. McPherson Road. Sight distances at the intersection and along the adjacent curves are severely limited. Travel lanes are 9-foot wide with 4-foot wide shoulders and carry an estimated 2,800 vehicles per day at Level of Service (LOS) C.

The CRF in both 2000-2002 and 2003-2006 data sets is greater than 1.00 with multiple injury collisions. Crash types are primarily single vehicle off-road collisions. Guardrails show evidence of numerous impacts.

The realignment of this segment is included in the 2007 Unscheduled Projects List as a medium priority at both the ADD and KYTC District levels. This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allotted to design for the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.



Aerial of Hollow Bill Curves

Recommendations:

Realign segment to correct geometric deficiencies.

Cost Estimate:

Design	\$	400,000
Right of Way	\$	600,000
Utilities	\$	360,000
Construction	\$	4,040,000



View north from H.W. McPherson Road



View south from northernmost curve



Intersection Improvements at KY 1293

Location 1-H: KYTC Spot 1-4a

Logan County, MP 30.900 - Muhlenberg County, MP 0.260

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Logan County</i>										
Location 1-H: Intersection with Iron Mountain Road & KY 1293							1.54	0	7	Σ = 28
WSA Spot	30.850	30.950	N/A				1.27	0	2	Σ = 5
KYTC Spot 1-4a	30.993	0.043	0.23							
WSA Spot	31.030	0.080	N/A				1.06	0	1	Σ = 4

Description:

KY 1293 provides access to Lake Malone and the rural communities of Dunmor, Agnes, and Deer Lick. It intersects US 431 as a stop-controlled T-intersection at the Muhlenberg/Logan County line within a horizontal and vertical curve. An embankment stands on the western side of US 431, limiting sight distance for turning vehicles. In the area, US 431 has 9 to 10-foot wide lanes and 2 to 4-foot wide shoulders. The speed limit is 55 mph, dropping to 45 mph entering Dunmor. In 2007, an estimated 2,700 vehicles per day traveled this segment of roadway.

A number of intersections with local roadways lie to the immediate north in Dunmor, including Dunmor-Deerlick Road, Dunmor Church Road, and several commercial driveways. The increased number of access points within Dunmor affects both capacity and safety. The adjacent rural portion of this route operates at Level of Service (LOS) C, but this degrades to LOS E within the developed area. More turning opportunities exist within Dunmor; without turn lanes, motorists must use the mainline travel lanes to accelerate and decelerate. A high critical rate factor location appears in Dunmor as a result. In addition, terrain characteristics create steep grades for minor street approaches and mainline curves with poor sight distances.

This project falls within the limits of KYTC Item 3-8309.00 which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design for the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.



View north along US 431 through Dunmor



View north towards intersection with KY 1293

Recommendations:

Cut embankment and/or realign segment. For a long term improvement, a bypass east of the developed area at Dunmor is recommended for consideration.

Cost Estimate:

Design	\$ 225,000
Right of Way	\$ 570,000
Utilities	\$ 160,000
Construction	\$ 2,270,000



Intersection Improvements at KY 973

Location 1-I: KYTC Spot 1-5

Muhlenberg County, Milepoint 0.487

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-I: Intersection with KY 973/Dunmor										
KYTC Spot 1-5/WSA Spot	0.364	0.500	0.98	0	3	Σ = 4	2.92	0	3	Σ = 11

Description:

KY 973 meets US 431 at a three-leg, unsignalized intersection in the community of Dunmor. KY 973 provides access to Lake Malone State Park and the community of Rosewood. Seasonal vegetation and a series of curves have the potential to obstruct signage and limit sight distances for vehicles approaching US 431. Along US 431, a curve to the south and signs to the north limit sight distances at this intersection. Input from the Kentucky State Police suggests widening shoulders along this stretch of roadway from the Muhlenberg/Logan county line to milepoint 1.5, just south of Skipworth Lane.

In this area, US 431 has 10-foot wide lanes and 2-foot wide shoulders with a speed limit of 45 miles per hour. The estimated daily traffic volume is 2,600 vehicles. This segment operates at a Level of Service (LOS) E, primarily as a result of limited passing sight distances and the number of driveways and access points within the developed area.

This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design of the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Relocate sight distance obstacles on US 431. Improve or relocate signage on KY 973 approaching US 431. For a long term improvement, a bypass east of the developed area of Dunmor is recommended for consideration.

Cost Estimate:

Design	\$ 20,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 50,000

View north (left) and south (right) at KY 973 intersection





Widen Bridges over Rocky Creek and Branch

Location 1-J: KYTC Spot 1-6 & 1-6a

Muhlenberg County, Milepoints 3.454, 3.634

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-J: Intersection with Belcher Lane & Penrod Cutoff Road; Rocky Creek							1.56	0	6	Σ = 20
KYTC Spot 1-6/WSA Spot	3.354	3.500	1.69	0	0	Σ = 6	2.39	0	2	Σ = 9
KYTC Spot 1-6a/WSA Spot	3.600	3.700	N/A				2.39	0	3	Σ = 9
KYTC Spot 1-7	3.930	4.030	1.69	0	3	Σ = 6	0.27	0	1	Σ = 1

Description:

These 30-foot long RCDG structures lie northwest of the community of Penrod in southern Muhlenberg County. The bridges cross Rocky Creek and a branch of Rocky Creek approximately 950 feet apart. At 21 feet wide, both structures are functionally obsolete with sufficiency ratings of 65.9 and 60.6¹, respectively, and satisfactory/minor deterioration ratings for both sub- and super-structure.

The impact of the narrow bridges is expressed in elevated numbers of single vehicle collisions with roadside features (e.g., bridge railing) and the increased occurrence of sideswiping vehicles bound in opposite directions. The southern bridge displays these trends more directly but guardrails along both structures show evidence of previous impacts. Warning signs are posted approaching each structure to alert motorists that the route narrows.

Both bridges were identified by the Muhlenberg County Judge Executive during the public input portion of this project as a candidate for widening/replacement. This project also falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Replace/widen both bridges to meet current width standards. Also consider widening mainline shoulders between the structures.

Cost Estimate:

Design	\$	120,000
Right of Way	\$	150,000
Utilities	\$	130,000
Construction	\$	1,200,000



View along US 431 of southern bridge over Rocky Creek

¹ Based on May 2006 State Bridge Inventory Guide



Realign Segment north of Penrod

Location 1-J: KYTC Spot 1-7

Muhlenberg County, Milepoints 3.900-4.200

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-J: Intersection with Belcher Lane & Penrod Cutoff Road; Rocky Creek							1.56	0	6	Σ = 20
KYTC Spot 1-6/WSA Spot	3.354	3.500	1.69	0	0	Σ = 6	2.39	0	2	Σ = 9
KYTC Spot 1-6a/WSA Spot	3.600	3.700	N/A				2.39	0	3	Σ = 9
KYTC Spot 1-7	3.930	4.030	1.69	0	3	Σ = 6	0.27	0	1	Σ = 1

Description:

This horizontal curve north of Penrod occurs just north of two narrow bridges crossing Rocky Creek. In this segment, US 431 has 10-foot wide lanes and 2-foot wide shoulders. The annual daily traffic is estimated at 2,600 vehicles per day and the roadway operates at a Level of Service (LOS) C through the 2030 design year.

A number of crashes occurred during 2000-2002, primarily involving vehicles running off the road to avoid colliding with a stopped vehicle ahead; the majority of these crashes occurred during wet roadway conditions. The number of crashes has been reduced based on 2003-2006 data. Injury collisions make up a large portion of the total crash composition.

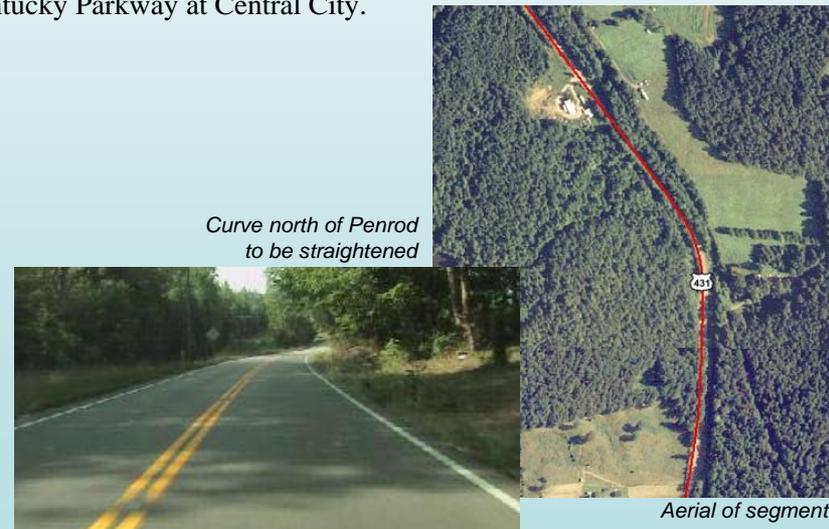
This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for the design phase to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway at Central City.

Recommendations:

Realign inside existing curve to increase radius.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 220,000
Utilities	\$ 180,000
Construction	\$ 750,000



Curve north of Penrod to be straightened

Aerial of segment

Realign Segment at Hudson Lane/Union Ridge Road Intersections

Location 1-K

Muhlenberg County, Milepoints 4.600-5.100

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 1-K: Intersections with Hudson Lane, Union Ridge Road										
WSA Spot	4.600	4.700	N/A				1.83	1	8	Σ = 19
WSA Spot	4.800	4.900	N/A				1.06	1	2	Σ = 4
WSA Spot	5.000	5.100	N/A				2.65	0	4	Σ = 10

Description:

The intersection of Union Ridge Road provides access to US 431 for the community of Union Ridge and other scattered residences in rural southern Muhlenberg County. Myers Chapel Road intersects US 431 approximately 100 feet to the north. Hudson Lane, approximately a half-mile southwest, also provides residential access from US 431 with a steep uphill grade approaching the mainline. These intersections lie in a series of vertical and horizontal curves which severely limit sight distances.

The impact of this alignment is expressed in the number and type of crashes: 63 percent of reported crashes involve a vehicle running off the roadway. An additional 21 percent directly involve a turning vehicle to or from US 431.

This segment falls within a larger section between milepoints 5.0-7.0 identified by the Kentucky State Police as a likely “high crash zone” recommended for shoulder widening. This project also lies within the limits of a design project (Item 3-8309.00) which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Realign this segment of roadway to improve reverse curves in alignment, adjusting entrances and improving sight distances. As a short term mitigation, vegetation south of Hudson Lane should be routinely trimmed by KYTC Maintenance personnel.

Cost Estimate:

Design	\$ 560,000
Right of Way	\$ 1,000,000
Utilities	\$ 900,000
Construction	\$ 5,600,000



Union Ridge Road Intersection, facing north



Hudson Lane Intersection looking southwest along US 431

Intersection Improvements at KY 2270

Location 1-M: KYTC Spot 1-8a

Muhlenberg County, Milepoint 6.964

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 1-M: Intersection with KY 2270										
KYTC Spot 1-8a/WSA Spot	6.950	7.050	0.75	0	1	Σ = 3	1.09	1	2	Σ = 6

Description:

The intersection of KY 2270 with US 431 lies in the community of Belton in southern Muhlenberg County. KY 2270 is offset across US 431 by approximately 200 feet, forming two closely spaced T-intersections. A continuous entrance runs along the southwest quadrant and provides access to a post office and commercial property. Roadway signage, vegetation, and an abandoned house limit sight distances for vehicles turning from KY 2270.

At this location, US 431 has 10-foot wide lanes and 1-foot wide shoulders. To the south, the route served an estimated 2,600 vehicles per day in 2007 at a Level of Service (LOS) C. On the segment north of the intersection, traffic volumes increase to almost 5,000 vehicles per day and the route operates at a LOS D. Daily traffic volumes are around 1,000 vehicles on KY 2270.

Input received from the Kentucky State Police during the public input portion of this study suggests widening shoulders from Union Ridge Road through Drakesboro. This project also falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Remove or relocate sight distance obstacles at this intersection.

Cost Estimate:

Design	\$ 20,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 50,000

Southern view from KY 2270 intersection at Belton



KY 2270 Intersection looking north



Intersection Improvements at KY 246

Location 1-O: KYTC Spot 1-10

Muhlenberg County, Milepoint 8.020

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-O: Intersection with KY 246/Beechmont										
KYTC Spot 1-10/WSA Spot	7.950	8.050	2.81	0	6	Σ = 10	0.93	0	1	Σ = 7
KYTC Spot/WSA Spot	8.020	8.120	1.19	0	4	Σ = 6	0.19	0	0	Σ = 1

Description:

KY 246 intersects US 431 in the community of Beechmont, providing a connection to the Beech Creek community and KY 176. Approaching US 431, KY 246 splits into two two-way segments, creating three three-leg intersections in close proximity. A number of driveway entrances fall adjacent to this intersection, further increasing the number of conflict points. This intersection lies within a segment identified by the Kentucky State Police for a potential shoulder widening.

Crashes at this location typically involve a vehicle turning left, rear end crashes while slowing/waiting to turn, or angle collisions during the turning maneuver. In Beechmont, US 431 has two 10-foot wide driving lanes and one-foot wide shoulders. The posted speed limit is 35 miles per hour. The 2007 ADT is reported at 4,600 vehicles per day, operating at a Level of Service E.

This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for the design phase to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway at Central City.

Recommendations:

Remove split lanes at intersection to form a single approach to a T-intersection. Improve driveway delineation and restrict entrance widths at adjacent commercial access points. In the long term, an opposing left turn lane through Beechmont or an alternative alignment east of the town may be considered.

Cost Estimate:

Design	\$ 50,000
Right of Way	\$ 50,000
Utilities	\$ 0
Construction	\$ 250,000



View from KY 246 east to US 431



Intersection Improvements at KY 70

Location 1-Q: KYTC Spot 1-12

Muhlenberg County, Milepoint 9.834

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-Q: Intersection with KY 70							1.12	0	10	Σ = 24
KYTC Spot 1-12/WSA Spot	9.734	9.900	1.67	0	5	Σ = 9	2.33	0	6	Σ = 13
WSA Spot	10.000	10.100	N/A				1.14	0	1	Σ = 7
KYTC Spot 1-13	10.222	10.322	0.717	0	2	Σ = 4	0.33	0	2	Σ = 2

Description:

KY 70 intersects US 431 in Muhlenberg County at the community of Browder, south of Drakesboro. As it approaches US 431, KY 70 splits into three two-way segments which form four intersections in close proximity to one another. Multiple entrances to commercial properties further complicate this intersection. A minor vertical curve limits sight distance to the south. Seasonal vegetation and parked vehicles at a car lot in the northeast quadrant limit sight distance to the north. A concentration of crashes involving vehicles turning to or from mainline US 431 appear in the 2003-2006 crash records at this intersection. The Kentucky State Police identified a segment of US 431 from milepoints 8.00 to 9.90 as a “high crash zone” and recommend shoulder widening be considered on this section.

Field observation indicates that these split lanes are used as passing opportunities for turning vehicles. As large trucks turn from US 431, smaller vehicles behind them will use one of the other approaches to attempt to get in front of the larger vehicle on KY 70. The intersection offset from US 431 then becomes a dangerous conflict point for inattentive motorists.

This project also lies within the limits of a design project (Item 3-8309.00) which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Remove split lanes to form a typical four way intersection. No additional right-of-way would be required for this cost-effective solution. As a maintenance procedure, vegetation and other sight distance obstacles should also be addressed.

Cost Estimate:

Design	\$ 25,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 100,000



View northeast at KY 70 intersections with US 431



Intersection Improvements at KY 176

Location 1-R: KYTC Spot 1-14

Muhlenberg County, Milepoint 11.467

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-R: Drakesboro, intersections with (1) Frazier, (2) KY 176, (3) KY 2107										
WSA Spot	11.100	11.200	N/A				1.23	1	18	Σ = 47
KYTC Spot 1-14/WSA Spot	11.400	11.500	1.71	0	4	Σ = 10	1.14	0	1	Σ = 7
KYTC Spot 1-15/WSA Spot	11.920	12.082	0.91	0	5	Σ = 6	2.66	0	4	Σ = 20
							1.06	0	4	Σ = 8

Description:

The US 431 intersection with KY 176 is located in Drakesboro, Kentucky. This four-leg signalized intersection has tight turning radii in each quadrant and continuous entrances to adjacent commercial properties. Reports indicate that water tends to pool in the roadway during rainfall events. A large number of heavy coal trucks use both the north and eastern approaches to access the TVA Paradise Steam Plant. Muhlenberg South High School is accessed by the western approach.

Like most intersections in developed areas, crash history trends indicate elevated rates for both rear end type and turning type crashes. A few mainline crashes related to the parking facilities at adjacent properties also are recorded. The Kentucky State Police identified this site as part of a segment at milepoints 11.00-12.10 for consideration as a “high crash zone” within the corridor.

In this area, US 431 is a two-lane undivided rural highway with 10-foot wide lanes and one-foot wide shoulders. The 2007 ADT is 8,000 vehicles; the roadway operates at a Level of Service (LOS) E under current conditions.

This project also lies within the limits of project 3-8309.00 which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design for the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Widen US 431 and add left turn lanes to provide storage for vehicle queues. Restrict widths of adjacent commercial entrances to improve intersection functionality. Drainage improvements should also be incorporated.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 390,000
Utilities	\$ 350,000
Construction	\$ 820,000

View northwest at intersection



Intersection of US 431 (north-south) and KY 176 (east-west) in Drakesboro



Intersection Improvements at KY 2107

Location 1-R: KYTC Spot 1-15

Muhlenberg County, Milepoint 11.982

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-R: Drakesboro, intersections with (1) Frazier, (2) KY 176, (3) KY 2107										
WSA Spot	11.100	11.200	N/A				1.23	1	18	Σ = 47
KYTC Spot 1-14/WSA Spot	11.400	11.500	1.71	0	4	Σ = 10	1.14	0	1	Σ = 7
KYTC Spot 1-15/WSA Spot	11.920	12.082	0.91	0	5	Σ = 6	1.06	0	4	Σ = 8

Description:

KY 2107 intersects US 431 in Drakesboro, runs parallel to mainline US 431, and then rejoins US 431 farther north at milepoint 16.5, just south of Central City. The southern intersection lies at a severe skew, forming a Y-type intersection in a long horizontal curve on US 431. There is an additional connection between the two routes approximately 100 feet north of the first. Sight distance is somewhat limited due to seasonal vegetation, the curvature of US 431, and the skew of the southern intersection.

Crashes at this location include rear end and angle collisions associated with vehicles turning. The site geometry, particularly for northbound traffic, creates a potential to unintentionally drift onto KY 2107 which requires an abrupt correction to continue along the horizontal curve on mainline US 431. The Kentucky State Police identified a segment at milepoints 11.00-12.10 for consideration as a “high crash zone” within the corridor.

In this area, US 431 serves approximately 8,200 vehicles per day at a Level of Service (LOS) D. A large portion of this through traffic on US 431 is composed of heavy coal trucks traveling between the Western Kentucky Parkway to the north and the TVA Paradise Steam Plant to the southeast.

This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the parkway.

Recommendations:

Realign the southernmost 100 feet of KY 2107 to intersect US 431 as a T-intersection. The KY 2107 approach may require cutting an embankment and/or additional vertical adjustments.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 180,000
Utilities	\$ 100,000
Construction	\$ 350,000



Intersection of US 431 (left) and KY 2107 (right) looking north



Intersection Improvements at Cleaton Road

Location 1-T: KYTC Spot 1-17

Muhlenberg County, Milepoint 15.184

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-T: Intersection with Cleaton Road										
KYTC Spot 1-17	15.150	15.250	1.46	0	1	Σ = 9	0.67	0	1	Σ = 5

Description:

Cleaton Road crosses US 431 just south of the Wendell H. Ford Western Kentucky Parkway, providing access to the communities of Cleaton and Holt, and a few industrial developments. At this point, US 431 is in a tangent section with 12-foot wide lanes which encourages high speeds and provides an opportunity for passing. A large number of coal trucks use US 431 to travel between the Parkway and mining developments to the south. Vegetation may create sight distance limitations for vehicles on the east approach. Almost all crashes at this location for 2003-2006 can be linked to vehicles turning to or from mainline US 431.

Just north of this intersection, a project is scheduled in the Six-Year Plan (Item No. 2-160.00) to improve a railroad crossing with funding designated through 2009 for all phases. This project is not anticipated to directly impact the Cleaton Road intersection. In addition, this segment falls within the project limits of a reconstruction/widening project in the Six-Year Plan (Item No. 3-8309.00) from north of Lewisburg to the parkway, with dedicated funding for the design phase.

Looking north at US 431 from Cleaton Road, east approach



Recommendations:

Install a center turn lane to remove turning vehicles from the path of high speed through traffic on US 431. Vegetation bordering the roadway should be routinely trimmed by KYTC maintenance forces.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 140,000
Utilities	\$ 145,000
Construction	\$ 520,000



Looking south at US 431 from Cleaton Road, west approach



Extend 4-Lane Section

Location 1-U: KYTC Spot 2-1

Muhlenberg County, Milepoint 17.300-17.584

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 1-U: Intersection with WKY Parkway/Central City										
WSA Spot	17.300	17.400	N/A				1.79	2	4	∑ = 16
KYTC Spot 2-1/WSA Spot	17.400	17.584	1.72	0	3	∑ = 7	1.04	2	2	∑ = 9

Description:

The Wendell H. Ford Western Kentucky Parkway crosses US 431 in Muhlenberg County, just south of Central City. The existing interchange has toll-booth style cloverleaf ramps meeting US 431 in a four-lane section with 12-foot wide lanes and 10 foot shoulders. South of the interchange, tapers extend south into a horizontal curve. A large number of heavy coal trucks use this route.

Field observation indicates that passenger cars, traveling south along US 431, will speed up to pass slow moving trucks turning south from the parkway ramps. As vehicles enter the horizontal curve to the south side-by-side, one vehicle will infringe into northbound lanes as the tapers end abruptly, thus, creating a hazardous situation for northbound vehicles approaching the four lane section. Crashes at this site are primarily rear end collisions, but also include a number of single vehicle collisions with fixed objects. Guardrail in this area shows evidence of numerous impacts.

This project falls within on the northern boundary of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the parkway.

Recommendations:

Extend ramp tapers south beyond horizontal curve. Consideration may be given to reconfiguring parkway ramps to a diamond-style interchange as the parkway is considered for inclusion into the I-66 corridor.

Cost Estimate:

Design	\$ 50,000
Right of Way	\$ 50,000
Utilities	\$ 25,000
Construction	\$ 275,000



View north along US 431 to parkway interchange



Widen Mainline to 3-Lane Section

Location 2-A: KYTC Spot 2-2

Muhlenberg County, Milepoints 17.900-18.200

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 2-A: North of WKY Parkway/Central City										
KYTC Spot 2-2/WSA Spot	17.900	18.012	0.73	0	2	Σ = 5	1.04	0	4	Σ = 9

Description:

The US 431 corridor between US 62 and the Wendell H. Ford Western Kentucky Parkway has experienced sizeable commercial development in the last five years with the addition of two hotels, restaurants, and other shops. To the south, there is a four-lane section leading to the parkway. To the north, a three-lane section begins at the US 62 intersection and continues north through Central City. Between these two sections, US 431 has two 12-foot lanes, a series of vertical curves, and an increasing number of commercial access points. Shoulders transition from 10 to 2-foot wide in this stretch. Local reports indicate shoulders in this section are commonly used as parking facilities for large trucks while drivers stop at adjacent restaurants.

Sight distance restrictions in this segment, coupled with the number of turning opportunities, create an increased potential for collisions. Sixty percent of crashes falling in this segment lie within the southernmost 0.10 miles where the roadway transitions between a 4-lane and a 2-lane facility. Trend analyses show a large portion of crashes involve vehicles turning to or from commercial entrances.

The reconstruction of the US 431/US 62 intersection is included in the 2007 Unscheduled Projects List as a medium ADD and high District priority. Improvements to this segment should integrate with improvements to this adjacent intersection.



View north into Central City

Recommendations:

Install a center turn lane from the 4-lane section in the south to the US 62 intersection. Access management principles should be incorporated as development continues along this segment. Signage may be incorporated to deter vehicles from parking on shoulders.

Cost Estimate:

Design	\$ 115,000
Right of Way	\$ 200,000
Utilities	\$ 460,000
Construction	\$ 950,000



Approaching parkway from north near transition from 2-lane to 4-lane section



Realign Segment at KY 81

Location 2-D: KYTC Spot 2-10, 2-11

Muhlenberg County, Milepoint 22.298-22.498

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 2-D: Intersection with KY 81/South Carrollton							2.42	0	10	$\Sigma = 21$
KYTC Spot 2-10/WSA Spot	22.298	22.400	3.67	0	N/A	$\Sigma = 16$	4.85	0	9	$\Sigma = 19$
KYTC Spot 2-11	22.398	22.498	1.97	0	2-6	$\Sigma = 10$	0.51	0	1	$\Sigma = 2$
Adjacent to Project 02-976.00 - Realign with Shoulders, GR for MP 22.4-22.7 (2009 construction \$)										

Description:

US 431 intersects KY 81 in South Carrollton and contains an at-grade railroad crossing and the termini of two local streets. Right-of-way is constrained by a cemetery east of the existing alignment, a gas station with contaminated soil in the southwest quadrant, and a number of residential structures. Severe grades excessively limit sight distances. Input from the Kentucky State Police received during the public involvement portion of this study indicates that this site lies within a potential “high crash zone” through South Carrollton to the power plant entrance and is recommended for widening to accommodate large trucks.

Single vehicle collisions, angle crashes with turning vehicles, and rear end collisions composed the crashes reported at this location. Nearly half of the crash reports indicate an injury occurred, although no fatalities were reported within the analysis period. In both the 2000-2002 and 2003-2006 crash data sets, this location exhibited the highest CRF along the entire length of the corridor.

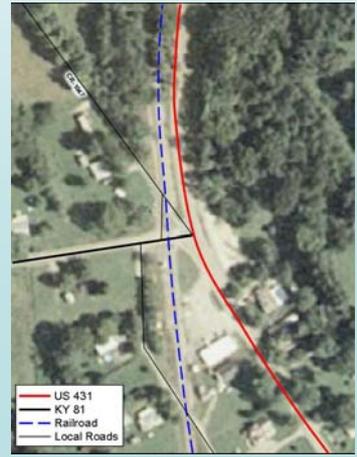
The segment immediately north of this intersection is scheduled for realignment and safety upgrades (Item 2-976.00) with funding dedicated through a 2009 construction phase. The 2007 Unscheduled Projects List also contains a reconstruction project from KY 189 in South Carrollton to the McLean county line which encompasses the KY 81 intersection. It is ranked as a medium priority at both ADD and District levels.

Recommendations:

Realign segment to improve intersection, including consolidation of local access points. Cut embankment north of intersection to improve sight distances. A bypass west of South Carrollton from KY 189 is also suggested for evaluation as a potential long term solution.

Cost Estimate:

Design	\$ 75,000
Right of Way	\$ 200,000
Utilities	\$ 125,000
Construction	\$ 300,000



Aerial image of intersection



Views north towards intersection with KY 81





Intersection Improvements at KY 250

Location 2-K: KYTC Spot 2-18

McLean County, Milepoints 9.800-9.950

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>McLean County</i>										
Location 2-K: Intersection with KY 250										
KYTC Spot 2-18/WSA Spot	9.800	9.900	1.09	0	3	Σ = 6	0.93	0	3	Σ = 6

Description:

KY 250 intersects US 431 in northeastern McLean County; approximately 250 feet north lies an offset T-intersection with Buck Creek Church Road. A cluster of homes, a church, and a business occupy the immediate area, increasing the number of driveways and access points for this segment of roadway. This intersection also provides access to McLean County High School in Calhoun.

Crashes at this location are due to a variety of circumstances; the limited sample size does not strongly suggest causation trends. Crash types include single vehicle collisions, rear ends, angle impacts, and a head on crash.

In this area, US 431 has two 12-foot wide lanes and 3-foot shoulders in a reverse curve, which limits sight distance. The ADT was around 6,200 vehicles per day in 2007, operating at a Level of Service (LOS) C. By 2030, traffic volumes are anticipated to reach 8,000 vehicles per day at a LOS D.

A project to address safety, condition, and service issues in McLean County from Livermore to the Daviess county line was identified as a high ADD priority and medium District priority in the 2007 Unscheduled Projects List.

Recommendations:

Install a center turn lane on US 431 to serve both KY 250 and Buck Creek Church Road. Consider removing access to the church parking lot from US 431. Drainage improvements should be considered with any other improvements to the roadway.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 200,000
Utilities	\$ 180,000
Construction	\$ 500,000



View north along US 431 at KY 250



Intersection of
US 431 (red) and
KY 250 (black)

Intersection Improvements at Harmons Ferry Road

Location 2-L

Daviess County, Milepoints 0.000-0.100

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Daviess County</i>										
Location 2-L: McLean/Daviess County Line										
WSA Spot	0.000	0.100	N/A				1.23	0	3	Σ = 8

Description:

At the McLean/Daviess county line, a concentration of crashes appears based on 2003-2006 crash data. At this location, US 431 lies in a tangent section terminating in a minor crest vertical curve to the south. The roadway has 12-foot wide lanes and 2-foot wide shoulders. Approximately 6,600 vehicles per day travel this segment, which operates at a Level of Service (LOS) D.

Several local cross streets and driveways turn off US 431 in this area. There is a wide gravel entrance to a commercial property along the eastern side of the route. Crash trend analyses indicate a large proportion of rear end type crashes.

The 2007 Unscheduled Projects List contains a road reconstruction/widening project from the McLean/Daviess county line through Panther Creek Bridge. This project is a medium priority at both the MPO and District levels.



View south (left) and north (below) along US 431 at McLean/Daviess county line



Recommendations:

Adjust vertical alignment south of the intersection with Harmons Ferry Road. Consider addition of turn lanes on US 431 and delineation of commercial entrance.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 150,000
Utilities	\$ 200,000
Construction	\$ 500,000



Improve Roadside Geometry

Location 2-M

Daviess County, Milepoint 1.985

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Daviess County</i>										
Location 2-M: Intersection with Mill Street										
WSA Spot	1.950	2.050	N/A				1.07	0	2	Σ = 7

Description:

The intersection with Mill Street lies in southern Daviess County, providing access to homes in the community of Utica and an additional connection between KY 140 and US 431. Mill Street approaches mainline US 431 at a steep grade; an embankment in the northwest quadrant limits sight distances for turning vehicles. US 431 has two 12-foot wide lanes and 2-foot wide shoulders. The speed limit is 55 miles per hour with limited passing sight distance.

A variety of crash types occur at this location, including rear end collisions, angle crashes with turning vehicles, and single vehicle collisions with fixed objects. The majority of crashes occur in poor lighting conditions; however, the limited number of records makes it difficult to determine if this is causal or coincidental.

In 2007, US 431 at Mill Street served 6,550 vehicles per day at a Level of Service (LOS) D. By 2030, this volume is expected to increase to 9,100 vehicles per day with operations continuing at LOS D.

The 2007 Unscheduled Projects List contains a road reconstruction/widening project from the McLean/Daviess county line through Panther Creek Bridge. This project is a medium priority at both the MPO and District levels.

Recommendations:

Cut embankment in northwest quadrant to increase sight distance.

Cost Estimate:

Design	\$ 20,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 75,000



View north along US 431 at Mill Street intersection

Intersection Improvements at KY 140

Location 2-N: KYTC Spot 2-19

Daviess County, Milepoint 2.599

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Daviess County</i>										
Location 2-N: Intersection with KY 140/Utica										
KYTC Spot 2-19/WSA Spot	2.599	2.699	1.41	0	6	Σ = 13	1.76	0	5	Σ = 14

Description:

The intersection with KY 140 lies in the community of Utica in Daviess County. This four-leg intersection is stop-controlled and has flashing warning beacons. A gas station in the northeast quadrant has wide driveway entrances. An embankment in the southwest quadrant has recently been cut by KYTC maintenance personnel to improve sight distance from the western approach.

South of this intersection, traffic volumes were estimated at 6,600 vehicles per day in 2007. Due to severe passing sight distance limitations, the Level of Service (LOS) is D. North of the intersection, the route serves an estimated 9,000 vehicles per day at a LOS D. The speed limit remains at 55 miles per hour passing through Utica.

Input received from the Kentucky State Police recommends adding turn lanes at this intersection and potentially realigning the segment to the north through milepoint five near Browns Valley-Red Hill Road. Reports indicate water pooling in the roadway may also be a concern north of the intersection.

A project in the 2007 Unscheduled Projects List sets widening the section of roadway between Panther Creek and the existing 4-lane section in Owensboro as a high MPO and District priority.

Recommendations:

Construct left turn lanes on US 431 approaches to intersection.
Remove vegetation obstructing sight distance.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 200,000
Utilities	\$ 200,000
Construction	\$ 750,000



View south along US 431 at KY 140 intersection