KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAY DESIGN
DIVISION OF HIGHWAY DESIGN

DESIGN EXECUTIVE SUMMARY

County: OLDHAM Item No.: 5-388.00

Federal Project No.: UPN: FD04 093 0053 003-007

MARS No.: 8085101D UPN:

Project Description:

La Grange - Ballardsville Road; Widen KY 53 from KY 22 at Ballardsville to I-71. (Phase I Design)

Roadway Classification:

☐ Local ☐ Collector ☒ Arterial ☐ Interstate ☒ Rural ☒ Urban

ADT(current) ADT ( ) DHV ( )

Posted Speed Limit: ☐ 55 (rural) ☐ 35 (urban) ☐ Other (Specify):

Design speed selected by the Project Team

☒ Concurrence in noted Typical Exceptions to be obtained from Director of Design.

DESIGN CRITERIA	EXISTING	TYPICAL	PROJECT TEAM RECOMMENDATION
Number of Lanes			
Pavement Width	SEE EXHIBIT A ON PAGE 3		
Shoulder Width, Slope			
Bridge Width		FOR	
Minimum Radius (e_{max}=)			
Maximum Grade		ALL	
Minimum Sight Distance			
Border Area (urban)	ROADWAY FACILITIES		

Design Criteria Notes:

A design exception is currently required for the vertical curve at the begining of the project (SSD = 453', Req'd SSD = 495'). This curve is located just to the south of KY 1315 and is outside of the original project mapping limits. Supplemental mapping for this section of road was provided by USGS (20 ft contours). The minimum sight distance for 55 mph will be obtained during the final design phase, when more detailed mapping becomes available.

DESIGN EXECUTIVE SUMMARY (continued)

Access Control Type: By Permit

Environmental Action: Environmental Overview Approval Date: N/A

Existing Pavement Depths: 1.0 inch Asphalt Surface with 3.5 inch Bit. Conc. Base on an 8 inch DGA base

Attachments:
(1) Map showing project location.
(2) Typical sections, including any bridges, on "8 1/2 X 11".
(3) Cost comparison table of alternates vs. Six-Year Plan.

Discussions:
(1) Alternatives considered including Preferred and No Build.
(2) If Preferred alternate cost is 15% or more above Six -Year Plan cost.
(3) Maintenance of Traffic Plan.
(4) Avoidance Alternatives to Water-Related Impacts.
(5) Consideration for bicycle and pedestrian facilities.
(6) Purpose and Need Statement.

Submitted By: _____ Date: 4/27/2011
Project Engineer, check one: (Depart of Highway ☐ or Consultant ☒)

Recommended By: _____ Date: 4-27-2011
Project Manager

Recommended By: _____ Date: 5/2/11
Location Engineer

Recommended By: _____ Date: 5/7/11
T.E.B.M. for Location

Comments:

See attachments: Exhibit A for Roadway Facilities, Exhibit B for the traffic volume changes at each intersection, Exhibit C for the various existing pavement depths, and Exhibit D for the LOS of each intersection for existing, no build, short-term and full-build situations.

GEOMETRIC APPROVAL GRANTED BY:

Signature: _____ Date: 7/21/11
Director, Division of Highway Design

EXHIBIT A

DESIGN ITEM			ROADWAY FACILITY	
			KY 53 Rural Section (South of Clarke Pointe Drive)	KY 53 Urban Section (North of Clarke Pointe Drive)
Roadway Classification		Local		
		Collector		
		Arterial	X	X
		Interstate		
		Rural	X	
		Urban		X
Traffic		ADT (2008)	7,220 (See Exhibit B)	30,920 (See Exhibit B)
		ADT (2030)	18,980 (See Exhibit B)	39,400 (See Exhibit B)
		AM DHV (2030)	1,740 (See Exhibit B)	2,730 (See Exhibit B)
		PM DHV (2030)	1,870 (See Exhibit B)	3,730 (See Exhibit B)
Speed		Posted Speed Limit (mph)	55 (35 within Ballardsville city limits)	45
		Design Speed Selected (mph)	55	45
Design Exceptions Require Director of Design Approval			YES	YES
DESIGN CRITERIA	Number of Lanes	Existing	2	4 w/ Turn Lanes
		Typical	2	4
		Recommendation	Varies (2 to 4) w/ Turn Lanes **	4 w/ Turn Lanes
	Lane Width	Existing	10'	11'
		Typical	12'	12'
		Recommendation	12'	11' ***
	Shoulder Width, Slope	Existing	Mix of no shoulder and 4' at 8.33% paved	Mix of curb & gutter and varying width paved shoulder
		Typical	8' at 4% paved 10' Total ****	Curb & Gutter
		Recommendation	8' at 4% paved 10' Total	Curb & Gutter
	Bridge Width	Existing	-	-
		Typical	-	-
		Recommendation	-	-
	e-max	Existing	10%	10%
		Typical	8%	4%
		Recommendation	8%	4%
	Minimum Radius	Existing	325'	848.83'
		Typical	965'	730'
		Recommendation	2500'	1200'
	Maximum Grade	Existing	12.52%	10.86%
		Typical	5%	7%
		Recommendation	4.05%	6%
	Minimum Sight Distance	Existing	229'	375'
		Typical	495'	360'
		Recommendation	453' *	363'
	Sidewalk	Existing	-	Varies
		Typical	-	5'
		Recommendation	-	5'
	Border Area	Existing	-	Varies
		Typical	-	10'
		Recommendation	-	14'

Note: KYTC Design Manual Exhibits 700-03 and 700-04 have been used to establish design criteria for this project.

* See design criteria notes on page 1 for design exception note.

** Limits of the 2-lane rural section for KY 53 begin at KY 1315 and end at the intersection with KY 22 East. Limits of the 4-lane rural section for KY 53 begin at KY 22 East and end at the intersection with KY 22 West.

*** 11 ft lanes minimum for interrupted flow conditions per KYTC Design Manual Exhibit 700-04.

**** 10 ft total width (8 ft paved) shoulders for Arterial Roadways with ADT over 2000 per KYTC Design Manual Section HD-702 Table: Minimum Paving Width Requirements for Shoulders

Exhibit B				
KY 53 Traffic Volumes				
Intersection	2008 ADT	2030 DHV AM	2030 DHV PM	2030 ADT
KY 53 @ KY 1315 (Eastbound - Stop Controlled)	2160	540	780	4000
KY 53 @ KY 22 East (Westbound - Stop Controlled) 2030 New Traffic Signal	6120	970	1200	11020
KY 53 @ KY 22 West (Eastbound - Stop Controlled) (Westbound - Stop Controlled) 2030 New Traffic Signal	7220	1740	1870	18980
KY 53 @ (KY 2856 (Old Moody Lane) (Eastbound - Stop Controlled)	8040	1520	1730	17000
KY 53 @ Blakemore Lane (Eastbound - Stop Controlled) 2030 New Traffic Signal	8500	1400	1680	16500
KY 53 @ Glen Eagles Way (Eastbound - Stop Controlled)	12020	1500	1770	20960
KY 53 @ Peak Road	NA	1830	2070	23480
KY 53 @ Zhale Smith Road (Westbound - Stop Controlled) 2030 New Traffic Signal	14280	1590	1740	20840
KY 53 @ Kroger Entrance	17600	1670	2210	24000
KY 53 @ Cherrywood Drive (Eastbound - Stop Controlled)	19400	1740	2300	25880
KY 53 @ Grange Drive	21180	1730	2450	26900
KY 53 @ Moody Lane	30920	2730	3730	39400
KY 53 @ I-71 Northbound	NA	NA	NA	NA
KY 53 @ I-71 Southbound	26700	2620	3200	36400
KY 53@Crystal Drive	21560	1920	2270	26500

Exhibit C: Existing Conditions

Comments (Continued):

KY 53 at Zhale Smith Road:

DESIGN CRITERIA	EXISTING
Number of Lanes	2
Pavement Width	24 feet
Shoulder Width, Slope	8' earth 8.33%
Bridge Width	NA
Minimum Radius (Existing e_{max} =10%)	348.83 feet
Maximum Grade	1.778%
Minimum Sight Distance	425 feet

Existing Pavement Depths – 1.0 inch Asphalt Surface with 8 inch Bituminous Concrete Base on a 4 inch DGA base.

KY 53 from Grange Drive to I71:

DESIGN CRITERIA	EXISTING
Number of Lanes	4
Pavement Width	Varies (12-foot lanes with 16-foot median and turn lanes)
Shoulder Width, Slope	Varies
Bridge Width	NA
Minimum Radius (Existing e_{max} =10%)	1909.86 feet
Maximum Grade	4.681%
Minimum Sight Distance	375 feet

Existing Pavement Depths – 1.5 inch Asphalt Surface with 5 inch Bituminous Concrete Base on an 11 inch DGA base.

Exhibit D

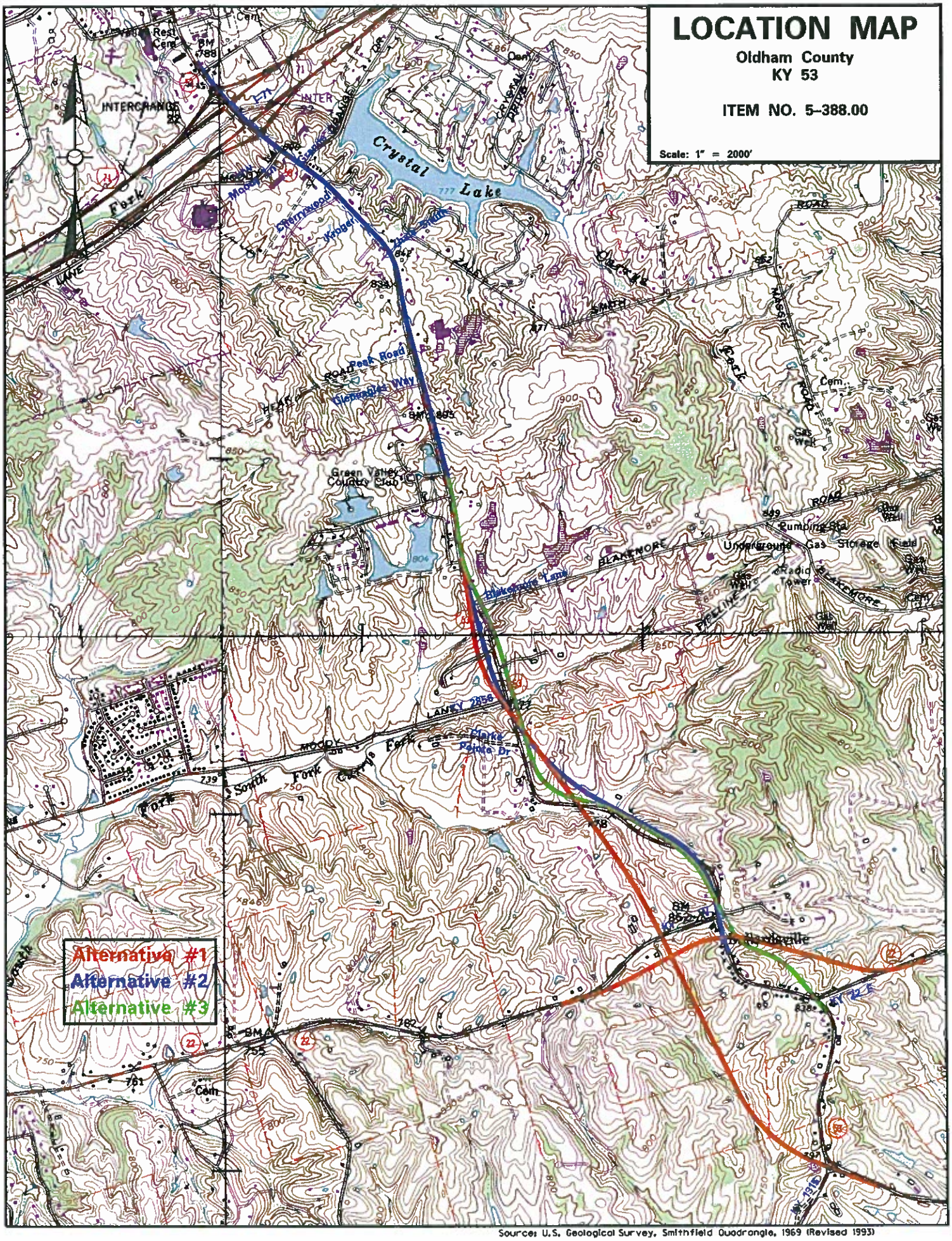
Intersection	2008 Existing	2030 No Build	2030 Short-Term	2030 Full-Build	2008 Existing	2030 No Build	2030 Short-Term	2030 Full-Build	2008 ADT	2030 ADT
	AM Peak OVERALL LOS				PM Peak OVERALL LOS					
KY 53 @ KY 1315 (Eastbound - Stop Controlled)	A	B	B	B	B	C	C	C	2160	4000
KY 53 @ KY 22 East (Westbound - Stop Controlled) 2030 New Traffic Signal (No Build only)	B	B	C	C	B	C	F	F (1)	6120	11020
KY 53 @ KY 22 West (Eastbound - Stop Controlled) (Westbound - Stop Controlled) 2030 New Traffic Signal	D C	D	C	C	D C	D	C	B	7220	18980
KY 53 @ (KY 2856 (Old Moody Lane) (Eastbound - Stop Controlled) 2030 New Traffic Signal	B	F	B	B	C	F	D	B	8040	17000
KY 53 @ Blakemore Lane (Eastbound - Stop Controlled) 2030 New Traffic Signal	B	D	B	B	B	F	D	B	8500	16500
KY 53 @ Glen Eagles Way (Eastbound - Stop Controlled)	C	F	F	D	C	F	F	F (2)	12020	20960
KY 53 @ Peak Road 2030 New Traffic Signal	---	B	B	B	---	F	C	B		23480
KY 53 @ Zhale Smith Road (Westbound - Stop Controlled) 2030 New Traffic Signal	C	C	B	B	C	B	A	B	14280	20840
KY 53 @ Kroger Entrance Ex. Traffic Signal	B	B	B	B	B	C	B	C	17600	24000
KY 53 @ Cherrywood Drive (Eastbound - Stop Controlled)	C	F	F	F	E	F	F	F (2)	19400	25880
KY 53 @ Grange Drive Ex. Traffic Signal	B	B	B	A	A	B	B	A	21180	26900
KY 53 @ Moody Lane Ex. Traffic Signal	B	C	C	C	C	C	C	C	30920	39400
KY 53 @ I-71 Northbound Ex. Traffic Signal	C	D	D	D	F	F	F	F (3)		
KY 53 @ I-71 Southbound Ex. Traffic Signal	C	F	F	F	C	F	F	F (3)	26700	36400
KY 53@Crystal Drive Ex. Traffic Signal	B	C	C	C	B	E	E	E (3)	21560	26500

(1) For the KY 22 EAST intersection, a signal was required for the 2030 No Build scenario due to capacity problems along KY 53 and a lack of turn lanes on all legs.
For the build scenarios, this intersection includes turn lanes in all directions and is just below the threshold for a signal warrant.
This intersection should be evaluated for a signal warrant in the design year using actual volumes to address this LOS.

(2) These intersections utilize Stop Control on the side roads, thus, LOS shown is for the side roads only.
The side roads at these intersections are not classified as Collector or Arterial roadways.

(3) Intersection not within Project Limits.

P:\PR44788\corresp\ky53DES\ky53plg_trafficomparison



Source: U.S. Geological Survey, Smithfield Quadrangle, 1969 (Revised 1993)
Ballardsville Quadrangle, 1961 (Photorevised 1978), La Grange Quadrangle, 1969 (Revised 199
Crestwood Quadrangle, 1981 (revised 1993)

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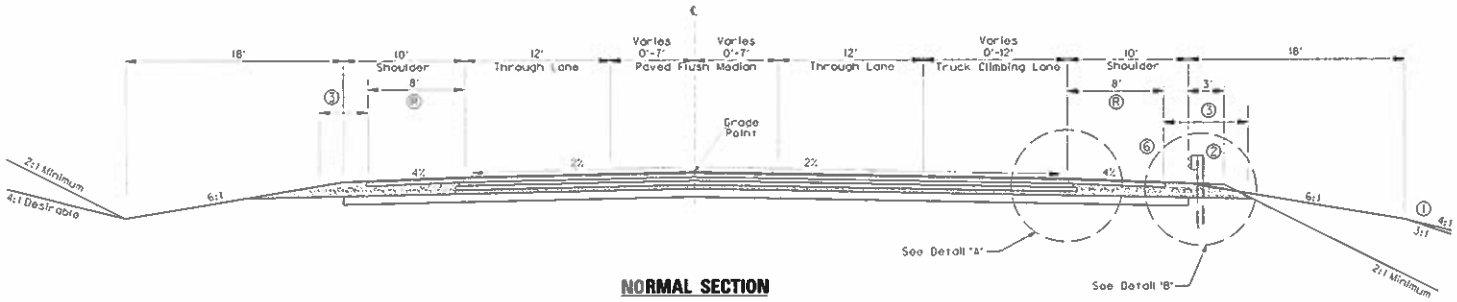
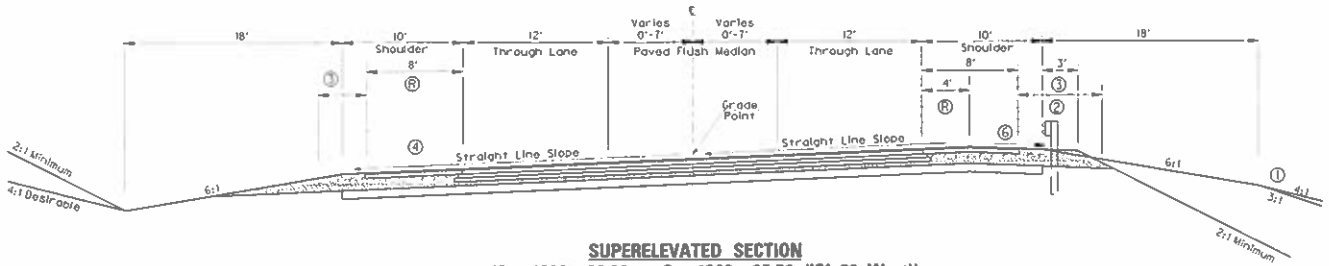
OLDHAM	5-388.00	R2-3L-55

TYPICAL SECTIONS
KY 53

RURAL MINOR ARTERIAL CLASS ROADWAY
55 mph DESIGN SPEED
ROLLING TERRAIN
CONTROL ACCESS BY PERMIT



NORMAL SECTION
(Sta. 1309+00.00 to Sta. 1363+85.79 (KY 22 West))
Truck Climbing Lane: Sta. 1345+00.00 to Sta. 1363+85.79 (KY 22 West)



SUPERELEVATED SECTION
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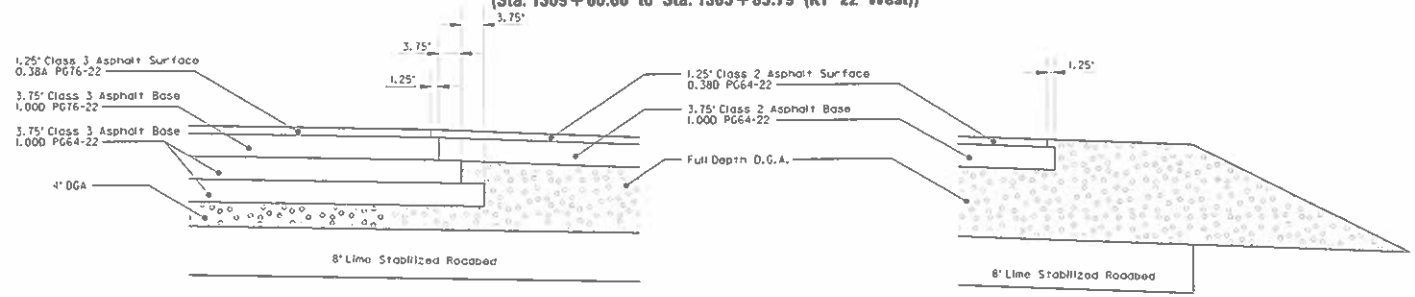


DETAIL "A" **DETAIL "B"**

PAVEMENT DESIGN

NEW CONSTRUCTION: FLEXIBLE PAVEMENT

Roadbed Preparation:

- 8" Lime Stabilized Modified Roadbed
  - Lime (6% by weight)
- Asphalt Curing Seal (2.0 lbs/sq. yd.)
- Sand for Blotter (5 lbs/sq. yd.)

Pavement:

Traffic Lanes:

Pavement Design Not Completed

Shoulders:

Asphalt Seal:

- Emulsified Asphalt RS-2 2.4 lb/sq. yd. (2 applications)
- Asphalt Seal Aggregate 20 lb/sq. yd. (Size No. 8 or 9M) (2 applications)

Plan Note:

NOTES:

① See Cross Sections for slopes beyond the limits of the shoulders.

② Shoulders shall be widened 3.0 feet where guardrail is to be installed.

③ Asphalt seal required from the outside edge of the paved shoulder to a point 2.0 feet down the ditch or fill slope.

④ Slope at same rate as superelevation except not flatter than slope indicated for normal shoulders.

⑤ High Side Superelevated Shoulder - construct to normal shoulder slope, except that the algebraic difference in shoulder slopes shall never exceed 12%.

⑥ Shoulders shall be paved full width within the guardrail limits. The remainder of the project shall be constructed with shoulders as otherwise shown.

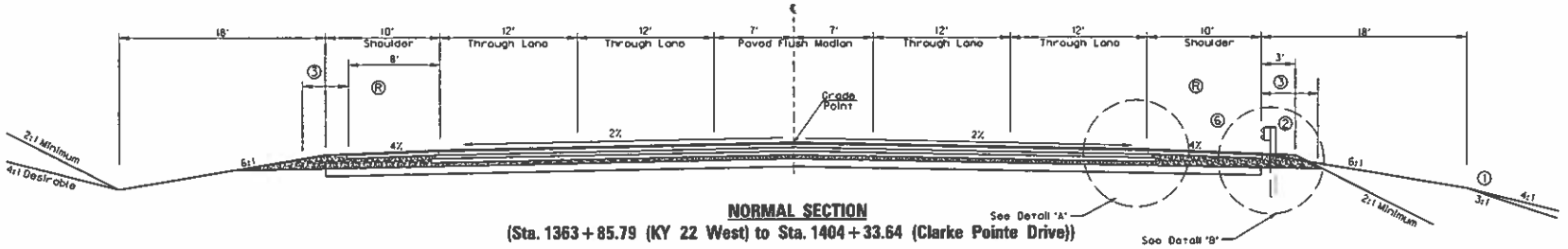
Ⓡ Construct Rolled Rumble Strips in accordance with Section 403.03.08 of the standard specifications.

TYPICAL SECTIONS
KY 53

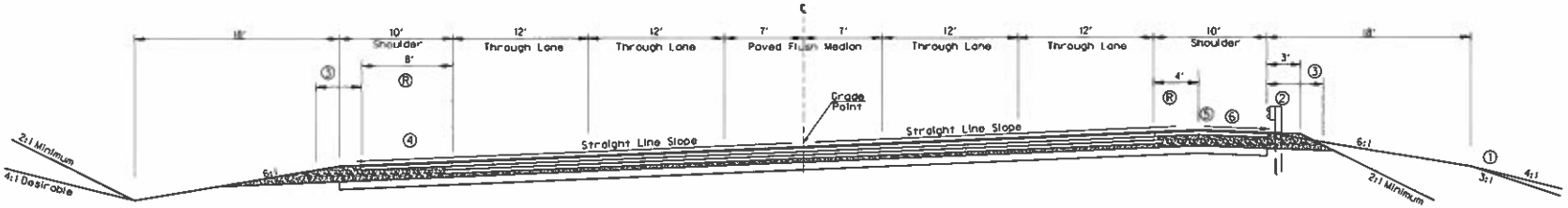
COUNTY OF	ITEM NO.	SHEET NO.
OLDHAM	5-388.00	RZ-5L-55

TYPICAL SECTIONS
KY 53

RURAL MINOR ARTERIAL CLASS ROADWAY
55 mph DESIGN SPEED
ROLLING TERRAIN
CONTROL ACCESS BY PERMIT



NORMAL SECTION
(Sta. 1363+85.79 (KY 22 West) to Sta. 1404+33.64 (Clarke Pointe Drive))



SUPERELEVATED SECTION
(Sta. 1363+85.79 (KY 22 West) to Sta. 1404+33.64 (Clarke Pointe Drive))

PAVEMENT DESIGN

NEW CONSTRUCTION: FLEXIBLE PAVEMENT

Roadbed Preparation:

- 8" Lime Stabilized Modified Roadbed
  - Lime (6% by weight)
- Asphalt Curing Seal (2.0 lbs/sq. yd.)
- Sand for Blotter (5 lbs/sq. yd.)

Pavement:

Traffic Lanes:

Pavement Design Not Completed

Shoulders:

Asphalt Seal:

- Emulsified Asphalt RS-2 2.4 lb/sq. yd. (2 applications)
- Asphalt Seal Aggregate 20 lb/sq. yd. (Size No. 8 or 9M) (2 applications)

Plan Note:

NOTES:

① See Cross Sections for slopes beyond the limits of the shoulders.

② Shoulders shall be widened 3.0 feet where guardrail is to be installed.

③ Asphalt seal required from the outside edge of the paved shoulder to a point 2.0 feet down the ditch or fill slope.

④ Slope at same rate as superelevation except not flatter than slope indicated for normal shoulders.

⑤ High Side Superelevated Shoulder - construct to normal shoulder slope, except that the algebraic difference in shoulder slopes shall never exceed 12%.

⑥ Shoulders shall be paved full width within the guardrail limits. The remainder of the project shall be constructed with shoulders as otherwise shown.

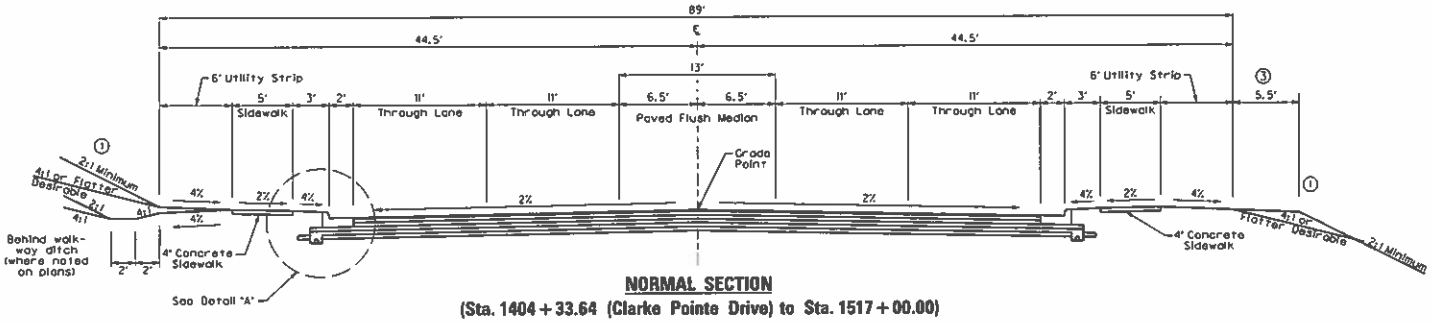
Ⓡ Construct Rolled Rumble strips in accordance with Section 403.03.08 of the standard specifications.

TYPICAL SECTIONS
KY 53 (5 LANE RURAL)

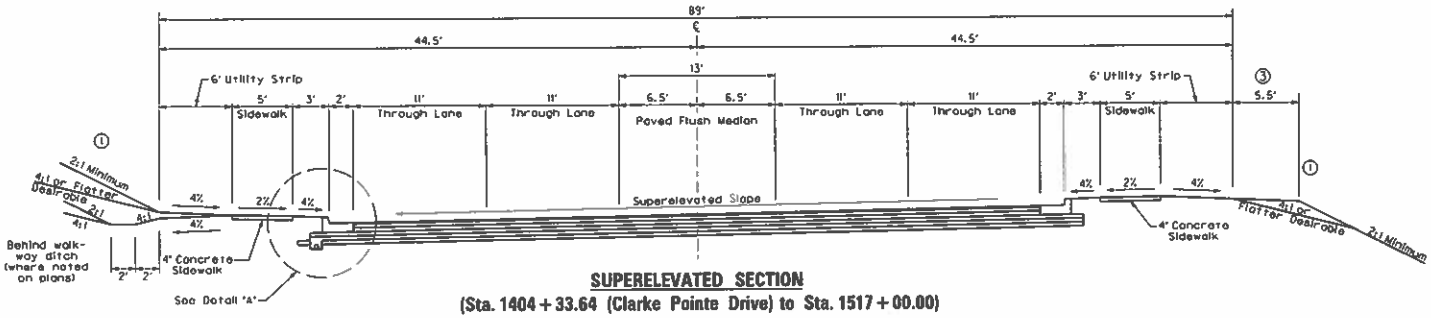
COUNTY OF	ITEM NO.	SHEET NO.
OLDHAM	5-388.00	R2-5L-URBAN

TYPICAL SECTIONS
KY 53

URBAN PRINCIPAL ARTERIAL CLASS ROADWAY
45 MPH DESIGN SPEED
ROLLING TERRAIN
CONTROL OF ACCESS BY PERMIT



NORMAL SECTION
(Sta. 1404 + 33.64 (Clarke Pointe Drive) to Sta. 1517 + 00.00)



SUPERELEVATED SECTION
(Sta. 1404 + 33.64 (Clarke Pointe Drive) to Sta. 1517 + 00.00)

PAVEMENT DESIGN
ASPHALT OVERLAY & FULL-DEPTH WIDENING

Pavement

Traffic Lanes:

Pavement Design Not Completed

Shoulders:

Standard Curb and Gutter

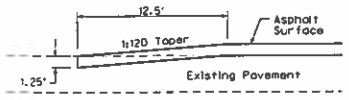
Plan Notes:

Notes:

① See cross sections for slopes beyond the limits of the shoulders.

② All longitudinal pipe drainage systems for the pavement drainage blanket shall be outletted to a Headwall, Ditch Box, or Curb Box Inlet. Outlets shall be in a fill section whenever possible. Outlet spacing shall not exceed 500 feet except grades 1% or less, then the spacing of outlets shall not exceed 250 feet. All sags shall have an outlet. The Design Engineer has spotted these on the plans or in the proposal.

③ Berm area widen to meet clear zone requirements for 45 mph design. Width may be reduced if guardrail is constructed in the high embankment areas.



EDGE KEY DETAIL

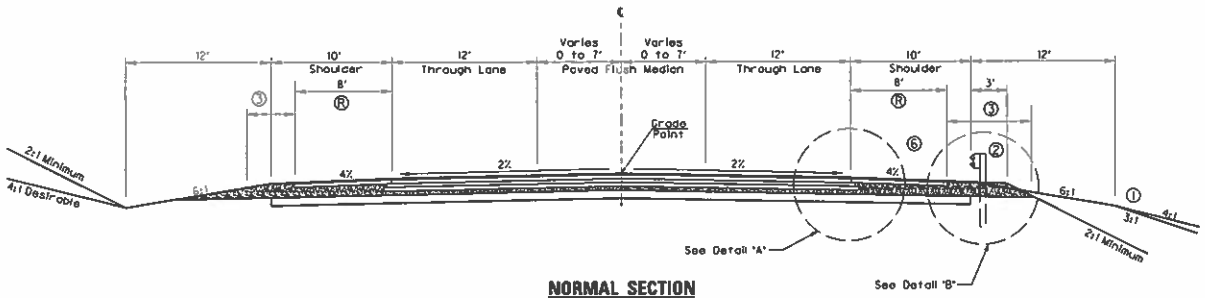
Work under this item shall include milling out the existing asphalt material so that the proposed asphalt surface may keel into the old surface. The contract unit bid price per foot for "Edge Key" shall include all necessary materials, labor, and equipment to perform the work and dispose of the material removed.

TYPICAL SECTIONS
KY 53 (5 LANE URBAN)

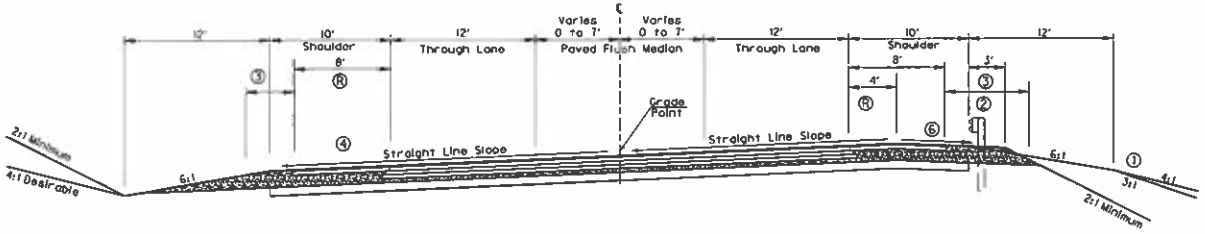
COUNTY OF	ITEM NO.	SHEET NO.
OLDHAM	5-388.00	R2-3L-45

TYPICAL SECTIONS
KY 22

RURAL MINOR ARTERIAL CLASS ROADWAY
45 mph DESIGN SPEED
ROLLING TERRAIN
CONTROL ACCESS BY PERMIT



NORMAL SECTION
(Sta. Sta. 900+00.00 to Sta. 919+80.00 (KY 22 East))
(Sta. Sta. 392+70.00 to Sta. 406+25.00 (KY 22 West))



SUPERELEVATED SECTION
(Sta. Sta. 900+00.00 to Sta. 919+80.00 (KY 22 East))
(Sta. Sta. 392+70.00 to Sta. 406+25.00 (KY 22 West))

PAVEMENT DESIGN

NEW CONSTRUCTION: FLEXIBLE PAVEMENT

Roadbed Preparation:

- 8" Lime Stabilized Modified Roadbed
  - Lime (6% by weight)
- Asphalt Curing Seal (2.0 lbs/sq. yd.)
- Sand for Blotter (5 lbs/sq. yd.)

Pavement:

Traffic Lanes:

Pavement Design Not Completed

Shoulders:

Asphalt Seal:

- Emulsified Asphalt RS-2 2.4 lb/sq. yd. (2 applications)
- Asphalt Seal Aggregate 20 lb/sq. yd. (Size No. 8 or 9M) (2 applications)

Plan Note:

NOTES:

① See Cross Sections for slopes beyond the limits of the shoulders.

② Shoulders shall be widened 3.0 feet where guardrail is to be installed.

③ Asphalt seal required from the outside edge of the paved shoulder to a point 2.0 feet down the ditch or fill slope.

④ Slope at same rate as superelevation except not flatter than slope indicated for normal shoulders.

⑤ High Side Superelevated Shoulder - construct to normal shoulder slope, except that the algebraic difference in shoulder slopes shall never exceed 12%.

⑥ Shoulders shall be paved full width within the guardrail limits. The remainder of the project shall be constructed with shoulders as otherwise shown.

Ⓡ Construct Rolled Rumble strips in accordance with Section 403.03.08 of the standard specifications.

TYPICAL SECTIONS
KY 22

KY 53

OLDHAM COUNTY

MARS NO. 8085110D

ITEM NO. 5-388.00

DISCUSSION OF ALL CONSIDERED ALTERNATIVES

BACKGROUND:

The proposed project consists of the design and construction of a new relocated KY 53 from KY 22 in Ballardsville to I-71 in Oldham County, Kentucky. KY 53 is one the county's major north-south routes to travel to either Shelbyville or Eminence and onto Frankfort from LaGrange. The existing KY 53 roadway varies within the project limits. From the beginning point to just south of Zhale Smith Road, the existing roadway consists of two 10-foot lanes with grass shoulders. Through the intersection with Zhale Smith Road, the travel lanes are 12 feet with 8-foot grassed shoulders. North of Zhale Smith Road to I-71, KY 53 widens to four 12-foot lanes with a 16-foot paved median. There are four traffic signals located north of Zhale Smith Road. They are located at the Kroger Entrance Road, Grange Drive, New Moody Lane, and the I-71 northbound exit ramp. There are numerous horizontal and vertical deficiencies throughout this section of KY 53, especially north of KY 22 East to Blakemore Drive, for the existing design speed of 55 mph. Upgrading this roadway would provide a safer facility for a segment of the Oldham County population that travels KY 53 daily for their jobs, local residents accessing both their homes and churches located along KY 53, and for school buses along this route.

Three relocated corridor alignments were proposed for KY 53. The Western Alternative, Alternative #1, begins at the KY 1315-KY 53 split located south of Ballardsville. KY 22 East will need to be realigned for this alternative. The Eastern Alternative, Alternative #2, begins just south of the KY 22 East intersection, and the Central Alternative, Alternative #3, begins at the KY 22 West intersection in the center of Ballardsville. The Central Alternative follows closely to the existing roadway where possible, while the Eastern and Western Alternative alignments are generally more cross-country. All three alternatives begin to converge near Prestwick Drive and stay generally on the east side of the existing roadway until they reach the Kroger Entrance Road. From this entrance road, all three alternatives follow the existing centerline to the I-71 northbound exit/entrance ramps.

Four typical sections were studied: a 2-lane rural section, a 3-lane initial / 5-lane ultimate rural section, a 5-lane rural section, and a 5-lane urban section. The urban alternative for all three alignments used the 5-lane urban typical section over its entire length. The Western Rural Alternative used the 2-lane rural section from the project beginning at KY 1315 to the reconstructed KY 22, then the 5-lane rural section to Cherry Creek Road. The Central Rural Alternative used the 3-lane initial / 5-lane ultimate rural section from the project beginning to Ann Trese Road, then the 5-lane rural section to Cherry Creek Road. The Eastern Rural Alternative used the 5-lane rural section from the project beginning to Cherry Creek Road. From Cherry Creek Road to the project end at New Moody Lane, all three rural alternatives then used a 5-lane urban section.

PURPOSE AND NEED:

The "purpose and need" for this project is to provide the traveling public a safe facility which meets current design standards. The goals for this project are:

- To increase safety and reduce accidents (See No Build Alternative section for crash data discussion).
- To improve the capacity and level of service of the roadway. (See Exhibit D for Existing, No-Build, and Build LOS)
- To accommodate the forecasted increase in automotive and commercial truck traffic on KY 53. (Year 2008 – 2,160 to 30,920 vehicles per day with 11.4% trucks; Year 2030 – 4,000 to 39,400 vehicles per day with 17.7% trucks)
- To provide a roadway facility that meets current design standards.

TYPICAL SECTION:

Division of Planning classified the new KY 53 as a Rural Arterial. For the rural typical section, the Geometric Design Criteria indicate a design speed of 55 mph for a Rural Arterial roadway in rolling terrain with year 2030 Average Daily Traffic of 7,020 to 39,400. The 5-lane rural typical section will include four 12-foot lanes, a 14-foot paved median, and 10-foot wide shoulders, of which 8-feet will be paved. The 3-lane initial / 5-lane ultimate section will include two 12-foot lanes, a 14-foot paved median, and 10-foot wide shoulders, of which 8-feet will be paved. The 2-lane rural typical section will include two 12-foot lanes and 10-foot wide shoulders, of which 8-feet will be paved. The access to the new KY 53 road will be by permit.

For the urban section, the typical section will include four 12-foot lanes, a 14-foot paved median, and an optional 6-foot bike lane (4-foot pavement and 2-foot gutter pan per KYTC DM Ex. 1500-01) with a 2-foot curb and gutter section. The urban typical section will also include a 3-foot utility strip, a 5-foot sidewalk, and a 6-foot berm area behind the sidewalk. The access to the new KY 53 road will be by permit.

NO BUILD ALTERNATIVE

A No Build Alternative would maintain the present roadway system with no improvements. The present roadway system contains substandard horizontal curves for a 55 mph design speed, unmet minimum sight distances at vertical sags and crests, grades more than the maximum allowable. While the No Build Alternative would not cause any community or environmental impact, it would fail to provide safety and accommodate future traffic volumes on KY 53. A review of Kentucky State Police collision data found approximately 625 accidents between January of 2000 and April of 2011. Almost three-quarters of these accidents occurred in the northern third of the project, north of Prestwick Drive. The predominant type of accident was a rear-end collision.

ALIGNMENT ALTERNATIVES CONSIDERED

PRELIMINARY STUDIES

At the beginning of the preliminary phase of the project, seven alternatives, two for each of the Central and Western Alternatives and three for the Eastern Alternative, were conceptually designed. Construction costs were not estimated for any of the alternatives during this conceptual phase. The centerline for the Eastern, Western, and Central alternative alignments is

the same from Zhale Smith Road to New Moody Lane, following the existing roadway centerline.

The two Western Alternative alignments studied were very similar. Both alignments began near the intersection of KY 53 with KY 1315, extend in a northwesterly direction away from Existing KY 53 and intersect Existing KY 22 near Brittany Lane. One of the main differences between the two alignments is the realignment of KY 22. The first alternative alignment for KY 22 crosses the existing KY 53 roadway just north of the Ballardsville Fire Department. The second alternative alignment curves to the south and runs behind the town of Ballardsville to avoid impacting any of the existing structures. It then ties into Existing KY 22 East at its intersection with KY 53 near the Ballardsville Baptist Church (New Dawn Baptist Church).

After the KY 22 West intersection, both of the Western Alternative alignments continue in a northwesterly direction crossing the Existing KY 53 roadway twice before merging into the same alignment just south of Clarke Pointe Drive. The alignments for both Western Alternatives then stay on the west side of the existing roadway before crossing over to the east side of Existing KY 53 near Sunset Drive. The proposed alignments then are located on the east side of Existing KY 53 until Zhale Smith Road.

The first two Eastern Alternative alignments begin just south of the intersection of KY 53 and KY 22 West near the Ballardsville Fire Department. Both alignments avoid impacting the parking lot in front of the Ballardsville Baptist Church. As both alignments cross over the Existing KY 53 roadway near Grand Dell Drive, several of the Crystal Bridge Fish Farm ponds will be disturbed by both alignments. Just north of the ponds, the two alignments diverge with one of the alignments veering west and staying close to the east side of the existing roadway while the other follows a more direct cross country route. The cross country alignment crosses Existing KY 53 near KY 2856, then curves and crosses Existing KY 53 again near Sunset Drive. The alignment then runs parallel with Existing KY 53 on the east side of the existing roadway, merging into the other eastern alignment near Gleneagles Way.

The third Eastern Alternative alignment is an optional alignment that can be applied to either of the two Eastern alignments. This cross-country alignment begins at the intersection of KY 53 and KY 22 East and bypasses all of the existing structures located on the east side of KY 53 before merging with either alignment at Grand Dell Drive. This existing section of KY 53 from KY 22 East to KY 22 West remains as a local access road.

The two Central Alternative alignments begin at the same point as the two Eastern Alternative alignments, just south of the intersection of KY 53 and KY 22 West near the Ballardsville Fire Department. These alignments are similar to the two Eastern Alternative alignments but avoid impacting the ponds on the Crystal Bridge Fish Farm. The two Central Alternative Alignments merge into the same alignment at Marion Drive.

The Western Alternative was selected that corresponded with the better of the two options for the realignment of KY 22. This alternative was also slightly shorter in length than the other western alignment being considered. Both the Central and Eastern Alignments were a combination of the five conceptual alignments described above. The selected alternatives reduced the impacts several properties including the Ballardsville Baptist Church and the Crystal Bridge Fish Farm Site.

WESTERN ALTERNATIVE – ALTERNATIVE #1

Alignment Alternative #1 is a 3.85 mile new cross-country alignment that bypasses Ballardsville to the west. In the conceptual phase it was associated with the KY 22 alternative that intersected KY 53 near the Ballardsville Fire Department. The alignment alternative begins at the intersection of KY 53 and KY 1315. This alignment extends in a northwesterly direction from K5 1315 and intersects KY 22 approximately 1000 feet west of the existing intersection of KY 53 and KY 22 West. As part of this alternative, KY 22 is realigned to connect KY 22 East and KY 22 West to one continuous movement around Ballardsville. KY 22's realignment begins near the Lost Valley Drive intersection.

The KY 22 Alternative Alignment crosses Existing KY 53 350 feet south of the existing KY 22 West and KY 53 intersection. It continues in an easterly direction and ties into the Existing KY 22 East nearly 1400 feet east of the existing KY 22 East and KY 53 intersection. The length of this realignment is 1.11 miles.

After the intersection with KY 22, Alternative Alignment #1 continues in a northwesterly direction crossing the existing KY 53 alignment twice, first 1600 feet south of Clarke Pointe Drive, then again 540 feet north of Clarke Pointe Drive. The alignment then veers in a more northerly direction crossing the existing roadway again near Sunset Drive. The alignment then stays on the east side of existing KY 53, following at a sixty-foot offset from the existing centerline until Zhale Smith Road. From Zhale Smith Road to New Moody Lane, the centerline for the proposed alignment follows the existing roadway centerline.

The horizontal and vertical alignments were designed for 45 mph from the beginning of the project to New Moody Lane. For the rural alternative, a 2-lane rural section is needed from KY 1315 to KY 22 West. A 5-lane rural typical section begins at KY 22 West and ends at Cherry Creek Road. From Cherry Creek Road to I-71, a 5-lane urban typical section is used.

For the rural alternative, ninety-eight properties are affected, with eight residences being taken by this alignment. For the urban alternative, ninety-five properties are affected, with seven residences being taken. For both alternatives, four of the residences being acquired are located along the KY 22 realignment. This alternative also crosses three blue line streams, requiring three box culverts. Also, an 800-foot channel change is needed for a tributary of Floyds Fork. The channel change is located between KY 1315 and KY 22 West.

EASTERN ALTERNATIVE – ALTERNATIVE #2

Alignment Alternative #2 is very similar to the conceptual Eastern Alternative that stayed closer to the east side of Existing KY 53 throughout its length. The alternative alignment begins approximately 300 feet south of the intersection of KY 53 and KY 22 West near the Ballardsville Fire Department. This alignment avoids impacting the parking lot of the Ballardsville Baptist Church, but it disturbs several of the ponds on the Crystal Bridge Fish Farm located across from the church property. Alternative Alignment #2 acts as a cross-country alignment from Grand Dell Drive to Clarke Pointe Drive. It crosses the existing roadway just north of Clarke Pointe Drive and again near Sunset Drive. From Sunset Drive to I-71, this proposed alignment follows Alternative #1's alignment. The total roadway length for this alternative is 3.13 miles.

The horizontal and vertical alignments were designed for 45 mph. For the rural alternative, the 5-lane rural typical section alternative begins at KY 22 West and ends at Cherry Creek Road. From Cherry Creek Road to I-71, a 5-lane urban typical section is used.

For the rural alternative, seventy-five properties are affected, with one residence being taken by this alignment. For the urban alternative, seventy properties are affected, with one residence being taken. This alternative also crosses three blue line streams, requiring three box culverts.

CENTRAL ALTERNATIVE – ALTERNATIVE #3

Alternative Alignment #3 is very similar to the conceptual Central Alternative that avoided impacting the Crystal Bridge Fish Farm ponds and stayed closer to Existing KY 53 throughout its length, though its horizontal alignment was extended to include the section of the third Eastern Alternative alignment that bypassed Ballardsville to the east.

Alternative Alignment #3 begins near the intersection of KY 53 and KY 22 East at the New Dawn Baptist Church (former location of the Ballardsville Baptist Church), where it departs Existing KY 53 by veering to the north. This allows the alignment to bypass to the east a section of Ballardsville from the church to the Ballardsville Fire Station. The alignment then crosses Existing KY 53 near Ann Trese Cove, avoiding the Crystal Bridge Fish Farm ponds by running to the west of Existing KY 53. The alignment then crosses Existing KY 53 shortly after the ponds, staying adjacent to the Existing KY 53 roadway on its east side until merging with Alternative #1 and #2's alignment just north of Sunset Drive. The total roadway length for this alternative is 3.50 miles.

The horizontal and vertical alignments were designed for 45 mph. For the rural alternative, a 3-lane rural section begins at KY 22 East and continues to KY 22 West. A 5-lane rural section begins at KY 22 West and ends at Cherry Creek Road. From Cherry Creek Road to I-71, a 5-lane urban section is used.

For the rural alternative, ninety-eight properties are affected, with one residence being taken by this alignment. For the urban alternative, ninety-three properties are affected, with one residence being taken. This alternative also crosses three blue line streams, requiring three box culverts.

ESTIMATED COSTS:

Estimated Year 2010 costs at the Preliminary Line and Grade Stage for all alternatives are:

PHASE	2008 Six Year Plan Budgets ***	Alternative #1 Rural Option**	Alternative #2 Rural Option**	Alternative #3 Rural Option**
Right-of-Way Acquisition	$6,080,000	$12,850,000	$10,050,000	$11,300,000
Utilities Relocation	$3,510,000	$3,200,000	$6,575,000	$4,970,000
Construction	$25,310,000	$22,770,099*	$16,516,937	$19,790,596
TOTAL	$34,900,000	$38,820,099	$33,141,937	$36,060,596

PHASE	2008 Six Year Plan Budgets ***	Alternative #1 Urban Option	Alternative #2 Urban Option	Alternative #3 Urban Option
Right-of-Way Acquisition	$6,080,000	$11,275,000	$8,850,000	$9,900,000
Utilities Relocation	$3,510,000	$3,200,000	$6,575,000	$4,030,000
Construction	$25,310,000	$29,372,404*	$18,991,444	$21,947,308
TOTAL	$34,900,000	$43,847,404	$34,416,444	$35,877,308

* Includes construction costs for the realignment of KY 22. Add $2,775,556 to Alternatives #2 and $0 to Alternative #3 for the realignment of KY 22.
** Add $1,199,012 to the construction costs for each rural alternative if the urban typical section is extended from Blakemore Lane to Cherry Creek Road.
*** 2010 Six Year Plan Budget data not available.

ENVIRONMENTAL ISSUES:

No environmental issues have been identified to select one alternative over the other. An environmental overview document has been prepared.

SELECTION OF THE PREFERRED ALTERNATIVE:

The Project Team selected Alternative #1 with several modifications as the preferred alternative. The main reasons for choosing Alternative #1 over Alternatives #2 and #3 include:

- Overall system connectivity is addressed. All substandard sections of Existing KY 53 are addressed.
- Presents opportunity to continue improvements of KY 53 toward Shelbyville in the future.
- Provides best access to planned and current schools on KY 22 West.
- Has the lowest utility cost.
- Provides increased development opportunities along the new cross country section of KY 53.
- Bypasses Ballardsville, avoids impacts to properties along the road, and provides for a "Main Street" area through town from the remnants of Existing KY 53.
- Results in no impacts to Ballardsville Baptist Church's parking lot and entrance or the Crystal-Bridge fish farm ponds.

The Project Team decided that KY 22 should not have a continuous movement. Reconstructing KY 22 to a continuous movement would have significant impacts to the town of Ballardsville, and both KY 22 and KY 53 remain operational if the existing offsets are maintained. The existing offset between KY 22 East and KY 22 West should be maintained by extending each leg of KY 22 (East and West) to Proposed KY 53. This modification to KY 22 as well as reducing the lane widths of KY 53 in the urban section from 12 feet to 11 feet with a 13-foot flush median and removing the bike lanes lowered both the construction and right-of-way costs. An additional access point to the proposed alignment from Existing KY 53 was provided. This new intersection with Existing KY 53 ties to the Proposed KY 53 alignment approximately 2000 feet south of Clarke Pointe Drive near Sta. 1390+00.

The limits of the rural and urban typical section were also adjusted. The Project Team determined that the 5-lane urban typical section should begin at Clarke Pointe Drive. The minimum sight distance for a 55 mph speed could not be met from Clarke Pointe Drive to Blakemore Lane. From Clarke Pointe Drive to Cherry Creek, this design change added close to 1.50 miles of an urban section. This adjustment to the preferred alternative as well as maintaining the offset between KY 22 East and KY 22 West allowed for the design speed to be raised to 55 mph through the rural section only. A 45 mph design speed will continue to be used from Clarke Pointe Drive to New Moody Lane.

Subsequent to the June 9, 2010 Preliminary Line and Grade Meeting, the preferred alignment was modified to avoid an LG&E substation near KY 2856. The relocation of this substation was estimated to be in the range of $250,000 to $300,000. The roadway was modified from south of Clarke Pointe Drive to south of Blakemore Lane, replacing the proposed horizontal curve with a tangent that runs more closely to Existing KY 53. This allows the section of Existing KY 53 south of Blakemore Lane that had been left in place to now be removed. This change also improves the intersections at KY 2856 and Clarke Pointe Drive and allows the Proposed KY 53 profile to more closely follow the existing ground, thus lowering earthwork quantities. However, one residential home will now most likely need to be purchased or moved.

Estimated Year 2011 costs for the Preferred Alternative:

PHASE	2008 Six Year Plan Budget *	Preferred Alternative Section One	Preferred Alternative Section Two	Preferred Alternative Section Three	Preferred Alternative TOTAL
Right-of-Way Acquisition	$6,080,000	$2,200,000	$4,950,000	$1,150,000	$8,300,000
Utilities Relocation	$3,510,000	$110,000	$2,615,000	$970,000	$3,695,000
Construction	$25,310,000	$4,619,808	$12,332,121	$1,853,459	$18,805,388
TOTAL	$34,900,000	$6,929,808	$19,897,121	$3,973,459	$30,800,388

* 2010 Six Year Plan Budget data not available.

The Project Team decided to break the proposed roadway into three construction sections, to be built as needed or as funding becomes available. Cost estimates in the table above reflect these sections. The resulting three sections would be:

- KY 1315 to KY 22 West: Two lane / three lane rural section (55 mph). The three lane configuration will be used between the KY 22 intersections, with a truck climbing lane added in the northbound direction. The truck climbing lane is necessary due to upgrade conditions exceeding the criteria in KYTC Design Manual Section HD-705. The anticipated northbound upgrade traffic flow in the design year is over 450 vph (Exhibit B), with an anticipated upgrade truck flow of over 45 vph. For the 4.05% upgrade, an 11 mph speed reduction is anticipated for heavy vehicles. Left turn lanes on the KY 22 legs will be added where necessary. If this section is not built initially, the R/W will be reserved for this section, if and when, KY 53 is planned to be improved to Shelbyville.
- KY 22 West to Zhale Smith Road: Five-lane rural section from KY 22 West to Clarke Pointe Drive (55 mph); five-lane urban section from Clarke Pointe Drive to Zhale Smith Road (45 mph). This section addresses the increased traffic due to the added road from the OCEDA development, the need for a Ballardsville bypass to avoid severe impacts to properties close to the existing road and the existing geometric deficiencies along KY 53.
- Zhale Smith Road to I-71: Five-lane urban section (45 mph) that addresses the current capacity problems.

MAINTENANCE OF TRAFFIC PLAN

PREFERRED ALTERNATIVE

Phase I

- Traffic shall be maintained along the existing roadway.
- Construct majority of the new cross-county alignment south of Blakemore Lane, providing at least two 10' lane widths where necessary to avoid impacting the existing roadway.
- Construct the southern end tie-in past KY 1315 with at least two 10' lane widths using part-width construction methods while maintaining traffic on the Existing KY 53 pavement. Work adjacent to Existing KY 53 will be accomplished behind a lane closure during daylight hours. The proposed paved shoulder may be used in some tight locations as part of the two temporary lanes. Use temporary guardrail as needed along the traveled way at locations with significant vertical differences between the existing and proposed roadways.
- Construct temporary traffic diversions at crossover locations (at the KY 53-Tie-In intersection, near the KY 2856 intersection and at the Blakemore Lane intersection) for use in Phase II.
- Construct entrances fully on the side of the proposed roadway opposite the existing roadway. Construct partial entrances on the side adjacent to the existing roadway by constructing driveway entrance extensions from the proposed roadway to a point near the existing roadway. Construct temporary connections from this point to the existing roadway where necessary. Complete the driveway connections as traffic is shifted over to the new roadway. Access shall be maintained to all residences to the existing roadway in some manner.
- Construct the new section of KY 22 East roadway. Construct tie in to Existing KY 53 using part-width construction. Barricade off access towards the new section of KY 22 East. Complete KY 22 East roadway connection with Existing KY 53 in Phase II, after traffic has shifted to Proposed KY 53.
- Construct KY 22 West using temporary pavement alongside the construction area to maintain existing traffic along KY 22 and KY 53. Barricade off access to Proposed KY 53.
- Construct Clarke Pointe Drive using part-width construction methods while maintaining Existing KY 53 traffic across Clarke Pointe Drive. Barricade off new intersection leg to the east towards Proposed KY 53.
- Construct KY 2856 (Moody Lane) using part-width construction methods while maintaining existing KY 2856 traffic. Barricade off access towards the newly constructed KY 2856 roadway. Complete the tie-in construction at KY 2856 (Moody Lane) after shifting traffic onto the new roadway in Phase II.
- Construct temporary pavement for Blakemore Lane intersection with the traffic diversion. Maintain Existing KY 53 traffic across Blakemore Lane. Barricade off access to traffic diversion.
- Construct ultimate KY 53 northbound direction providing at least two 10' lane widths when needed to avoid impacting existing roadway from Blakemore Lane to Zhale Smith Road. Use temporary guardrail as needed along the traveled way at locations with significant vertical differences between the existing and proposed roadways. Leave the ultimate portion unconstructed in the area of Eagles Landing Drive intersection.
- Construct a temporary new intersection with Eagle Crest Lane; also extend temporary intersection to Existing KY 53 to maintain traffic once the Eagles Landing Drive intersection is closed. Barricade off access to the Proposed KY 53 portion.
- Close intersection of Eagles Landing Drive. Construct remaining portion of Proposed KY 53 and new intersection at Eagles Landing Drive. Barricade off access to Proposed KY 53 and maintain temporary intersection at Eagle Crest Lane.
- Construct Prestwick Drive using part-width construction methods while maintaining access

to Existing KY 53/Heights Lane with temporary pavement. Barricade off access to Proposed KY 53.

- Construct temporary pavement between Existing KY 53 and Gleneagles Way to maintain traffic.
- Construct temporary pavement between Existing KY 53 and Cherry Creek Road to maintain traffic.
- Construct Zhale Smith Road by partial width construction using temporary pavement.
- Construct Proposed KY 53 from Zhale Smith to the project end by widening and overlaying Existing KY 53 pavement. Work adjacent to Existing KY 53 will be accomplished behind a lane closure during daylight hours.
    - Construct commercial entrance at the Kroger location using part-width construction methods.
    - Construct Cherrywood Drive using part-width construction methods.
    - Construct Lakeside Place using part-width construction methods.
    - Construct Grandview Court using part-width construction methods.
    - Construct Grange Drive using part-width construction methods.

Phase II

- Shift existing KY 53 traffic to two lanes of the newly constructed roadway utilizing traffic diversions. Remove barricades to the proposed roadway from intersections.
- Shift traffic to the traffic diversions, to complete the construction of the proposed roadway sections at the Existing KY 53 Tie-in intersection, at KY 2856, and at the Blakemore Lane intersection.
- Complete any remaining portions of Proposed KY 53 roadway using lane shifts where necessary. Work adjacent to traffic will be accomplished behind a lane closure during daylight hours. The proposed paved shoulder may be used in some tight locations as part of the two temporary lanes.
- Construct Blakemore Lane. The road may need to be temporarily closed by diverting traffic to Radcliff Road to KY 22 to KY 53. Reopen Blakemore Lane intersection when complete.
- Construct Sunset Drive by closing the road and diverting traffic to Lakeshore Blvd to Lakewood Drive to KY 53.
- Construct Marion Drive by closing the road and diverting traffic to Marian Way to the newly constructed Sunset Drive.
- Construct Lakewood Drive by closing the road and diverting traffic to Lakeshore Blvd to newly constructed Sunset Drive.
- Construct Heights Lane using part-width construction methods.
- Construct Gleneagles Way using part-width construction methods.
- Construct Cherry Creek Road using part-width construction methods.
- Remove temporary intersection at Eagle Crest Lane and open new intersection at Eagles Landing Drive.
- Construct new KY 53 Tie-in.

Phase III

- Open all lanes of Proposed KY 53 to traffic.
- Remove any traffic diversions.
- Finalize any remaining temporary connections at any intersections or entrances.
- Remove existing pavement on KY 53 where indicated.

CONSIDERATION OF BICYCLE AND PEDESTRIAN FACILITIES

Bicycle and pedestrian facilities currently do not exist on this section of KY 53 and little evidence of use by either was found along the route. Under the existing circumstances, cyclists would need to use the through lane for travel. Pedestrians would also have to step off the roadway onto the minimal earth shoulders or into the roadside ditch to avoid oncoming traffic.

KY 53 is listed as a bike lane in the *Bicycle, Pedestrian and Greenway Trails Master Plan, January 28, 2008* for Oldham County. In this report, it lists the benefits of trails and greenways for communities and the planned locations of trails throughout Oldham County. The proposed rural roadway design includes wider travel lanes and 10-foot shoulders (8-foot paved), which have safety and operational advantages in providing a place for bicyclists and pedestrians to operate along this corridor. Through the rural section, cyclists can also use the remaining portion of Existing KY 53 from KY 1315 to just south of Clark Pointe Drive, which goes through Ballardsville.

For the proposed urban roadway design, a ten-foot shared use path has been proposed at a three foot offset from the curb and gutter section. The shared use path will be located on one side of the road only; the side to be determined in final design. The West side is currently favored for the shared use path as it provides connectivity to the bike lane along the new road from the planned OCEDA development. Other bicycle and pedestrian facilities in the area include a shared use path along Commerce Parkway which connects to KY 53 just north of I-71. Both cyclists and pedestrians should encounter safer conditions within the limits of the proposed project than along the remainder of the KY 53 roadway south of KY 1315.

KY 53

OLDHAM COUNTY

MARS NO. 8085110D

ITEM NO. 5-388.00

AVOIDANCE OF WATER-RELATED IMPACTS

This project is located in the far eastern portion of Oldham County and south of the I-71 interchange with KY 53. It involves construction of a new roadway facility from KY 22 in Ballardsville to the I-71 northbound exit and entrance ramps to improve safety and reduce accidents on KY 53.

Three alignment alternatives were studied for this project. All of the alternatives were designed for both a five-lane rural typical section using a 45 mph design speed and a five-lane urban typical section using a 45 mph design speed. KY 53 will also include an additional truck climbing lane where the criteria are met.

South Fork Currys Fork and two tributaries of South Fork Currys Fork are impacted by these three alignments located within the project limits.

Along the existing KY 53 alignment, the existing culverts are located at the following locations:

Approximate Station	Estimated Culvert Size
Sta. 145+93.81	9' x 4' RCBC
Sta. 174+64.74	8' x 4' RCBC
Sta. 190+62.71	8' x 5' RCBC

There are no known wetlands within the proposed right-of-way limits of the project.

WATER RELATED IMPACTS SUMMARY

County	Oldham	**Route No.**	KY 53	**Item No.**	5-388.00
Date	2-23-2011	**Program #**	8085101D		
Federal Project No.	N/A				
State Project No.	FD04 093 0053 003-007				
Location Engineer	Robert Farley				

Section 1: Impact Checklist

Complete this section for each alternative considered at the conclusion of Phase 1 design.

FLOODPLAIN IMPACTS		
FEMA Study Type	**Yes**	**Community No.**
Detailed FEMA Study with delineated floodway*		
Detailed FEMA Study without delineated floodway*		
Approximate FEMA Study		
No FEMA Study	X	

* May require initiation of the map revision process if impacts to water surface elevations cannot be avoided. Potential impacts to floodplains and/or floodways shall be assessed early in the project. Refer to Sections DR 203 and DR 204 of the Drainage Manual.

SIGNIFICANT RESOURCE IMPACTS				
Are open sinkholes impacted? If so, how many sinkholes are impacted?	Yes		No	X
Are wetlands impacted? If so, how many total acres are estimated? _____ acres	Yes		No	X
Are any of the streams in the project area designated "Special Use Waters" (e.g. Wild Rivers, Exceptional Waters, Outstanding State Resource Water, etc.)?	Yes		No	X

Where possible, alignments should be developed that avoid significant resources. When it becomes impossible to avoid a significant resource, the project should be designed to minimize these impacts. Significant resource impacts are discussed in DR 202 of the drainage manual. Wetland impacts and their costs are also discussed in DR 500 of the Drainage Manual.

Projects that impact special use waters may require an individual KPDES Erosion Control Permit. Contact the Division of Environment analysis for more information.

STREAM CHANNEL IMPACTS				
Will stream relocations (channel changes) be needed? If so, how many total linear feet are estimated? 1025 LF	Yes	X	No	
Will new culverts or culvert extensions be constructed? If so, how many total linear feet are estimated? 720 LF	Yes	X	No	
Will temporary stream crossings be needed?	Yes		No	X
Will excess material sites that require permitting be needed?	Yes		No	X
Will bridges be constructed?	Yes		No	X
On highway projects that involve stream crossings such as bridge and culverts, it is often not feasible to totally avoid stream channel impacts. In these cases, design the project to minimize the impacts. Stream relocations should be avoided if possible. If stream relocations are unavoidable design to project to minimize their impacts. Stream channel impacts are discussed in DR 506, 601-3, 608-2, and 802-3 of the drainage manual.				

Section 2 : Impact Discussion

For the Preferred KY 53 Alternate, the stream relocation is unavoidable due to the proposed roadway exiting to the west from the existing roadway at the project beginning. To be to the west of the existing road and to totally avoid impacts to this stream would require a roadway that had major impacts to the houses to the west of Existing KY 53 through Ballardsville. Thus, minor stream relocation and minor residence impacts were weighed to arrive at the Preferred Alternative.

The new culverts were made as short as was possible by locating vertical sags near each water crossing but lengths in excess of existing culverts were necessary due to the wider proposed roadway template width.