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August 15, 2013

Mr. Robert Yeager, P.E.
TEBM -Project Development
Kentucky Department of Highways, D-6
421 Buttermilk Pike
Covington, Kentucky 41017

**RE: I-71 Improvement Priorities
I-71 Corridor Study
Item Number 99-394.00
Jefferson, Oldham, Henry, Carroll, Trimble, Gallatin,
and Boone Counties**

Dear Mr. Yeager:

At the June 4, 2013 I-71 Corridor Project Team meeting, KYTC requested that Qk4 provide a short list of potential projects and cost estimates for the I-71 corridor for consideration in the next Highway Plan. The attached I-71 Improvement Priorities pdf is included for your review. Qk4 provided a list of projects for approval to District 6 which were discussed on July 8, 2013 (see list below). The priorities in the corridor were evaluated utilizing safety and congestion as the purpose for any improvements. A safety analysis was performed based on Kentucky Transportation Center and Kentucky State Police crash data for the years 2009-2011. Where CCRF's for 0.1 mile spots were 1.0, individual crash reports for these spots were reviewed, and where appropriate, additional years of data were examined. Deficiencies, recent rehabilitation projects, existing year capacity analysis and geometric issues were reviewed and taken into consideration. Qk4 was asked to provide cost estimates and improvement options by August 15, 2013 for possible consideration into the next Kentucky Transportation Cabinet's Highway Plan.

1. Address safety issues in Gallatin County North of US 127 MP 62 to MP 64.0
2. Add southbound truck climbing lane near MP 38
3. Add capacity from I-265 to KY 329 in Jefferson/Oldham County (5.8 miles)
4. KY 14 to I-75 Capacity Addition in Boone County (4.1 miles)
5. Truck Climbing Lane for KY 227 North (1.2 miles)
6. KY 329 – KY 146 in Oldham County (2.5 miles)

The attached document is supporting information for each priority, which includes a draft Purpose and Need, cost estimates, and a corresponding improvement exhibit. This document also details several *"Quick Wins"* that could be implemented in the near future. These are in the areas of the prioritized improvements. Additional *"Quick Wins"* will be provided in the October submittal.





Following the meeting on July 8, 2013, traffic growth rates were approved by KYTC Division of Planning after agreement that the Statewide Traffic Model did not simulate cars correctly. An initial future year (2038) capacity analysis was performed for these priorities utilizing the Highway Capacity Manual (HCM 2010). Due to this model setback, a future year truck percentage has not been projected at this time; however, the existing conditions will only worsen as truck percentages increase.

Lastly, we discovered last week in conversations with KYTC Traffic Operations, Safety Engineering Section that additional signs and high friction pavement surface at MP 63 have now been approved and are targeted for an August 2013 letting. That location is our first priority due to the number of crashes since our first project team meeting; however, the district may decide to monitor those targeted improvements before implementing Priority #1.

If you have any questions, please contact Albert Zimmerman, Bruce Siria, or me.

Sincerely,

Annette Coffey, P. E.
Project Manager

AC/hw

cc: Mikael Pelfrey – CO Division of Planning

cc: Judi Hickerson – District 5, Planning

Enclosures (1)

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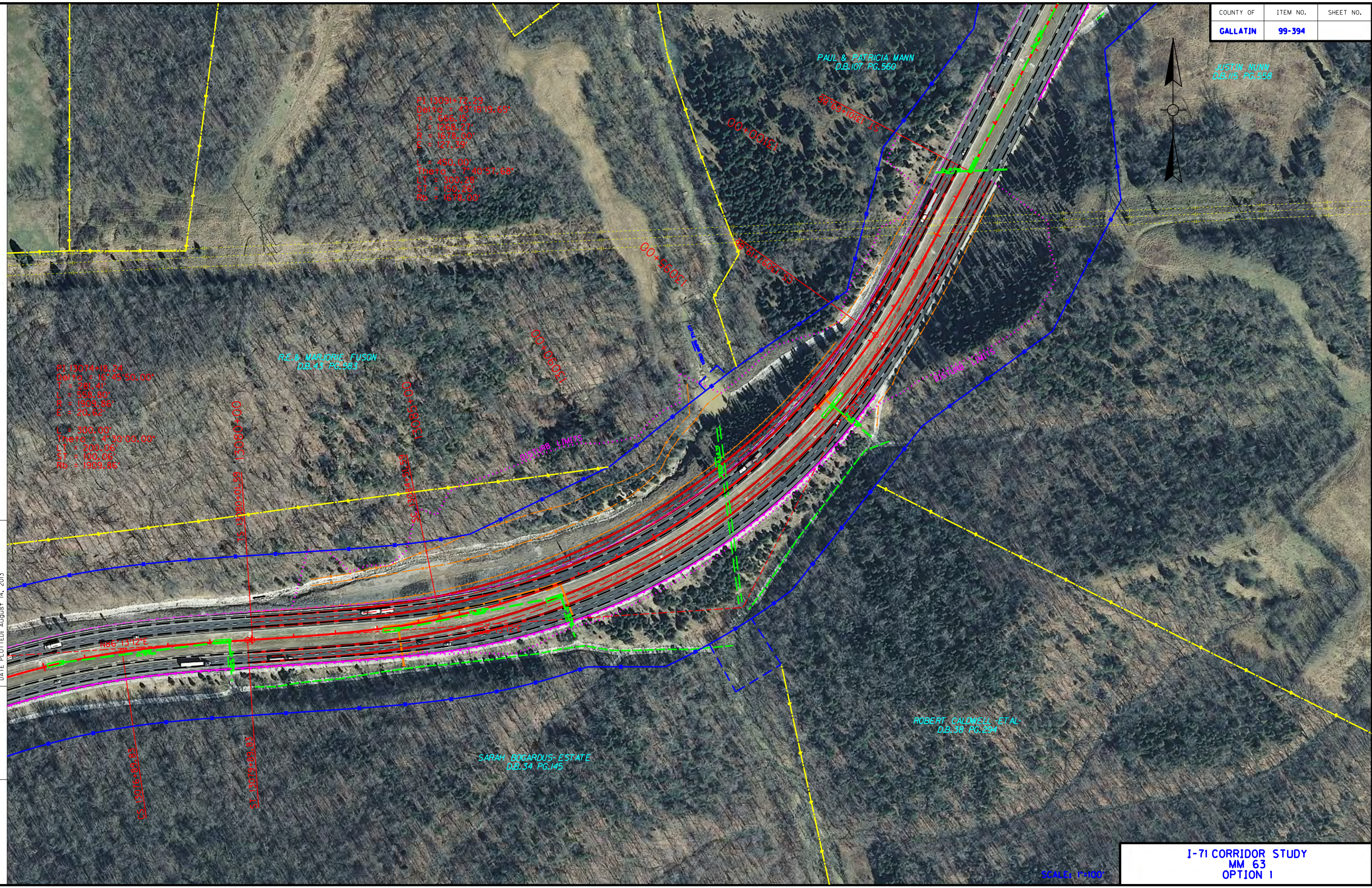
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DATE PLOTTED: August 14, 2013

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COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	

JUSTIN MUNN
D.B.115 PG.558



I-71 CORRIDOR STUDY
MM 63
OPTION 1

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	

JUSTIN NUNN
D.B.115 PG.558



PAUL & PATRICIA MANN
D.B.107 PG.560

El 13091+73.29
 Delta = 43°18'19.65"
 l = 686.15"
 L = 1258.27"
 R = 1676.00"
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R.E. & MARJORIE FUSON
D.B.43 PG.583

P3 13074-16.24
Depth = 16°45'50.80"
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R = 1903.86°
E = 20.62°

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ST = 100.06°
RB = 1909.86°

SARAH BOGARDUS- ESTATE
D.B.34 PG.145

ROBERT CALDWELL -ETAL-
D.B.38 PG.294

I-71 CORRIDOR STUDY
MM 63
OPTION 1 WITH WALL

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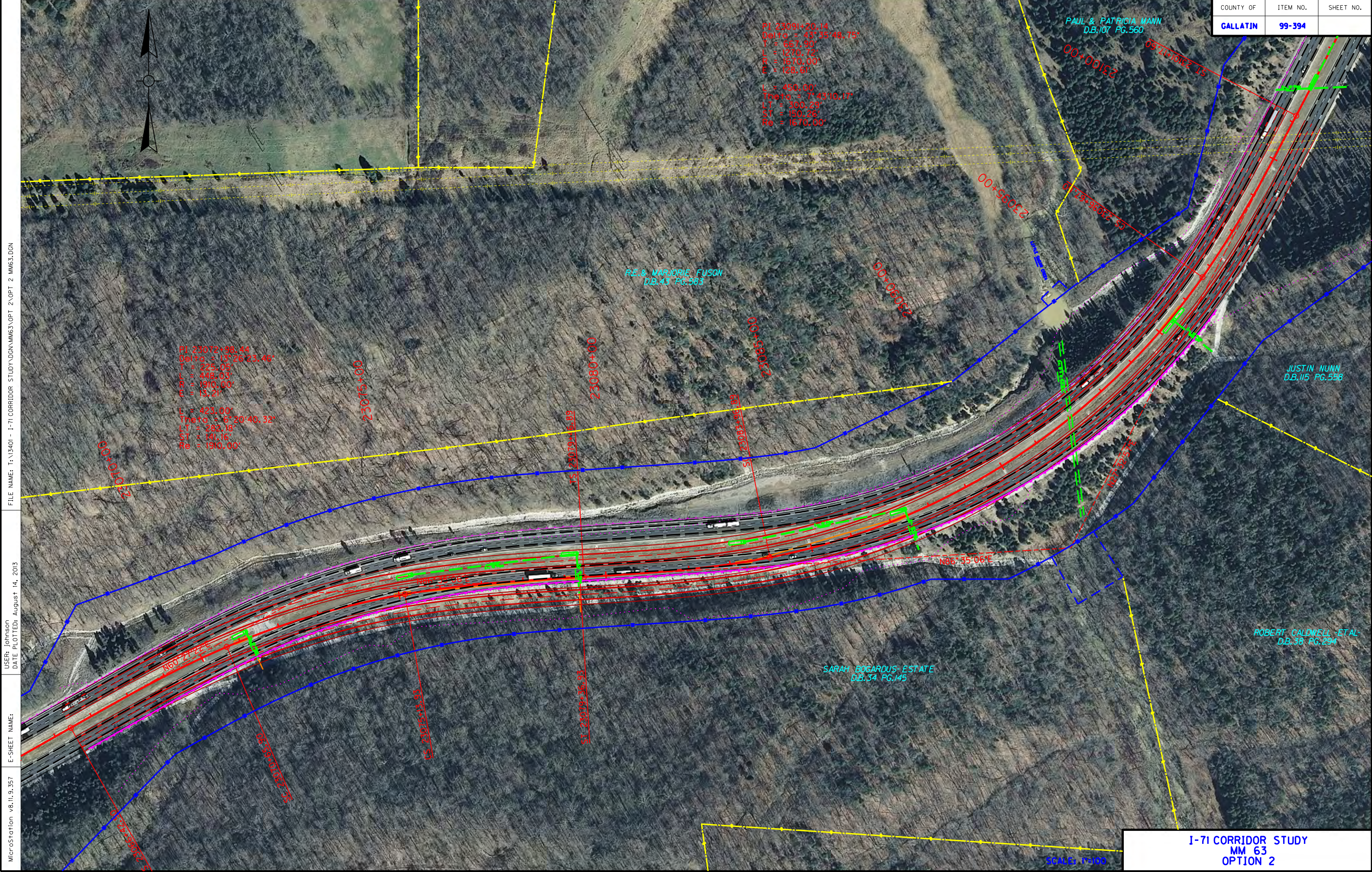
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GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63
OPTION 2

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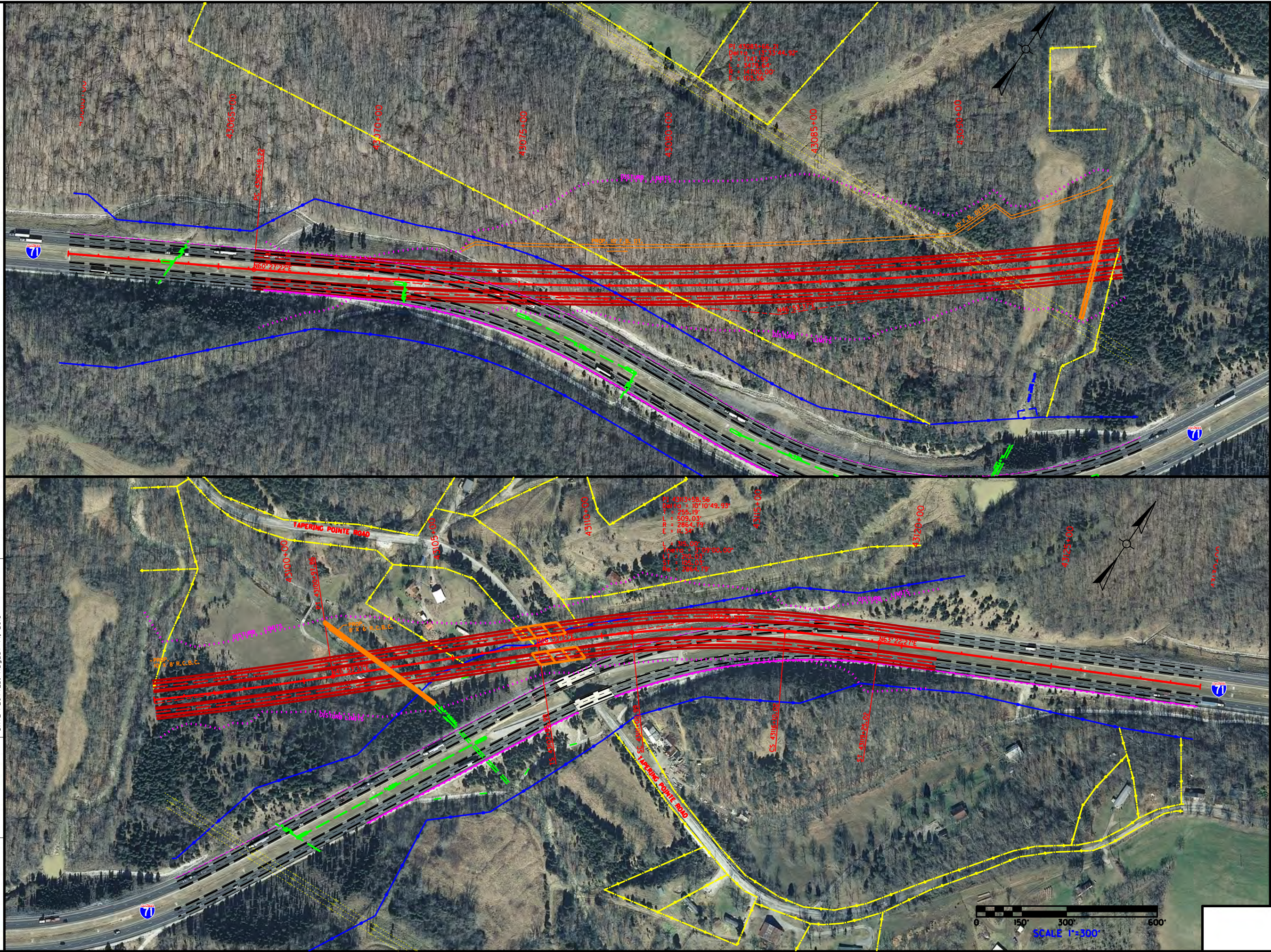
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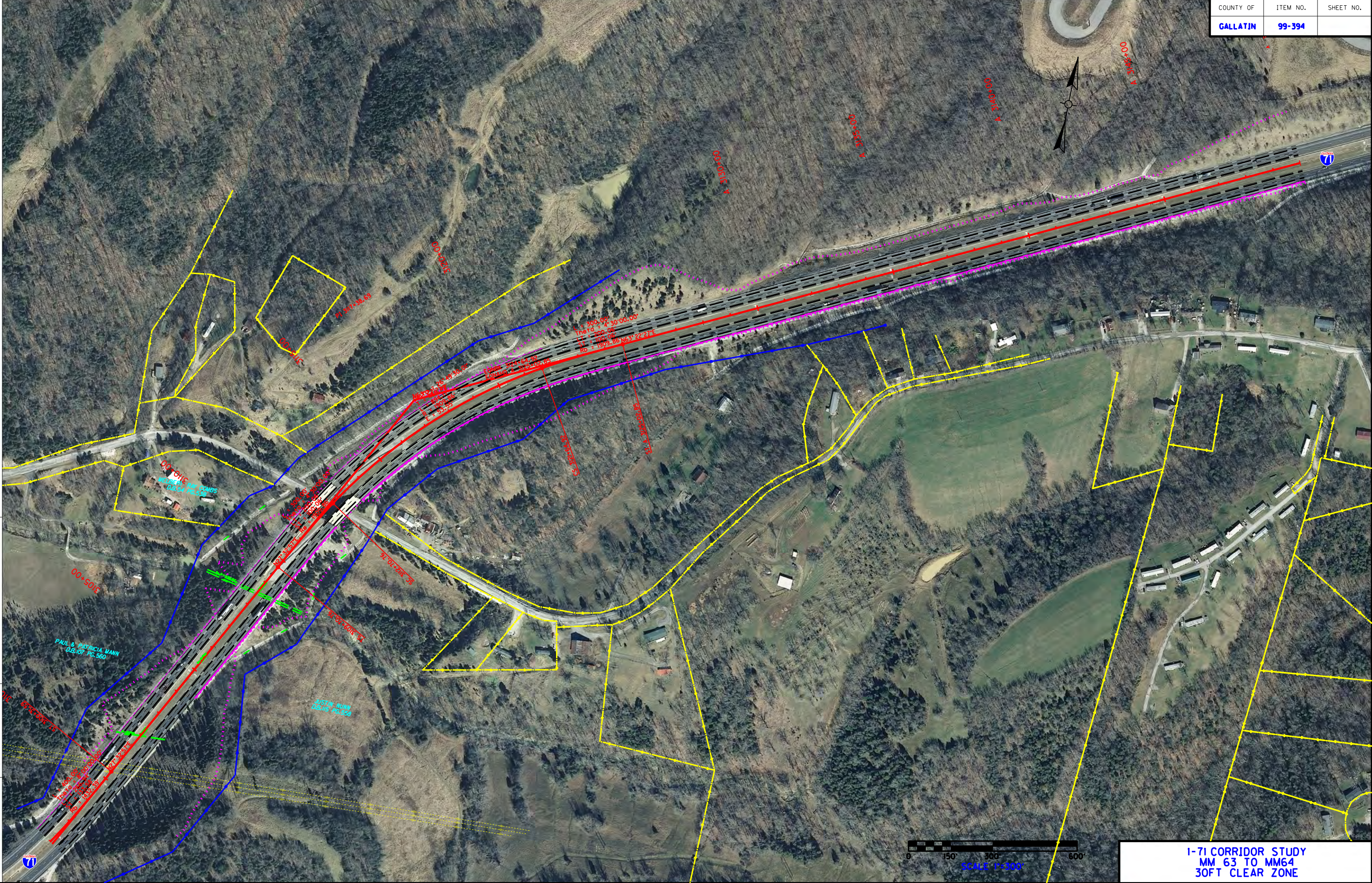
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GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63
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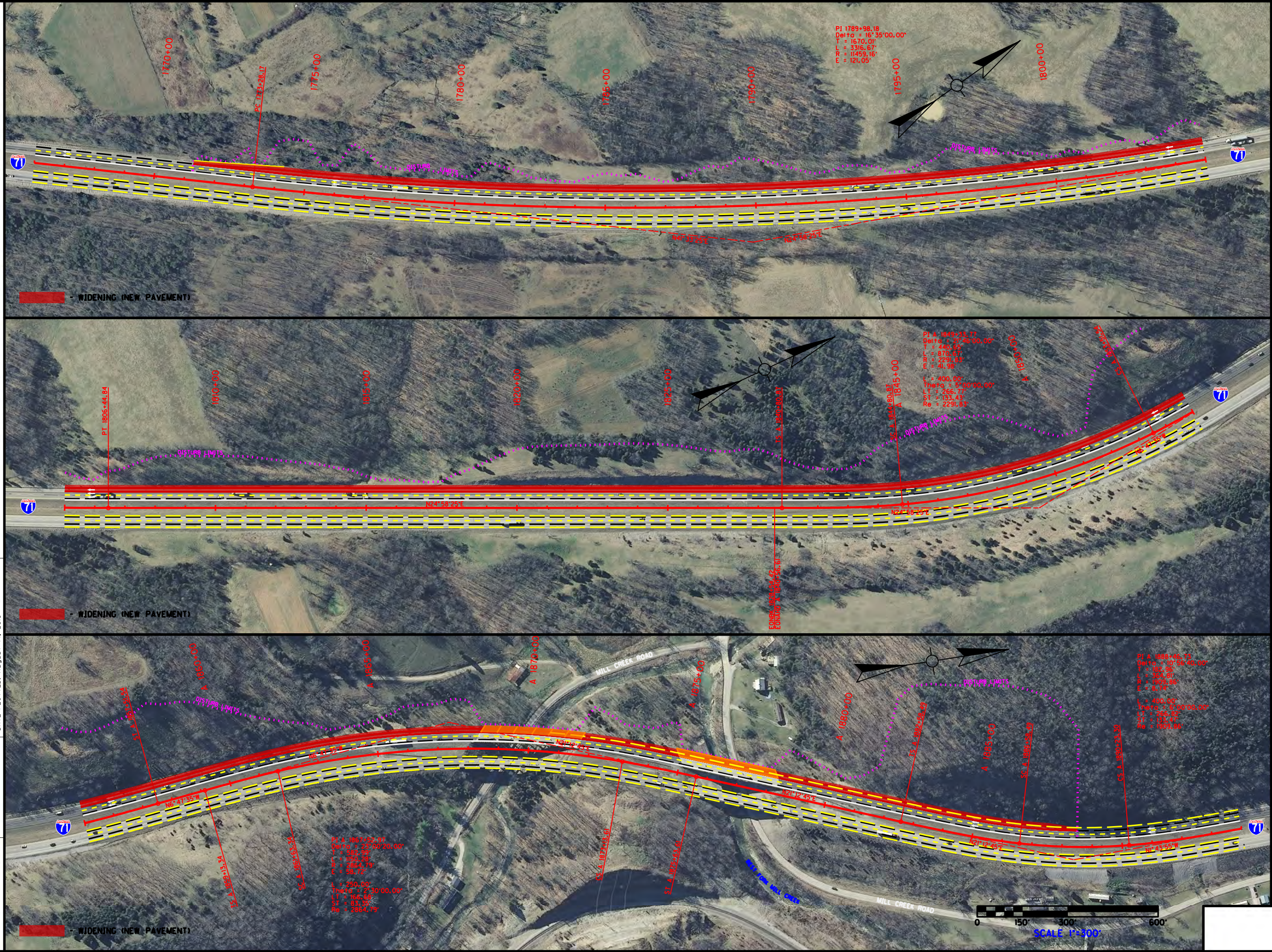
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MicroStation v8.11.9.357

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63 TO MM 64
30FT CLEAR ZONE

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HENRY / TRIMBLE / CARROLL	99-394.00	

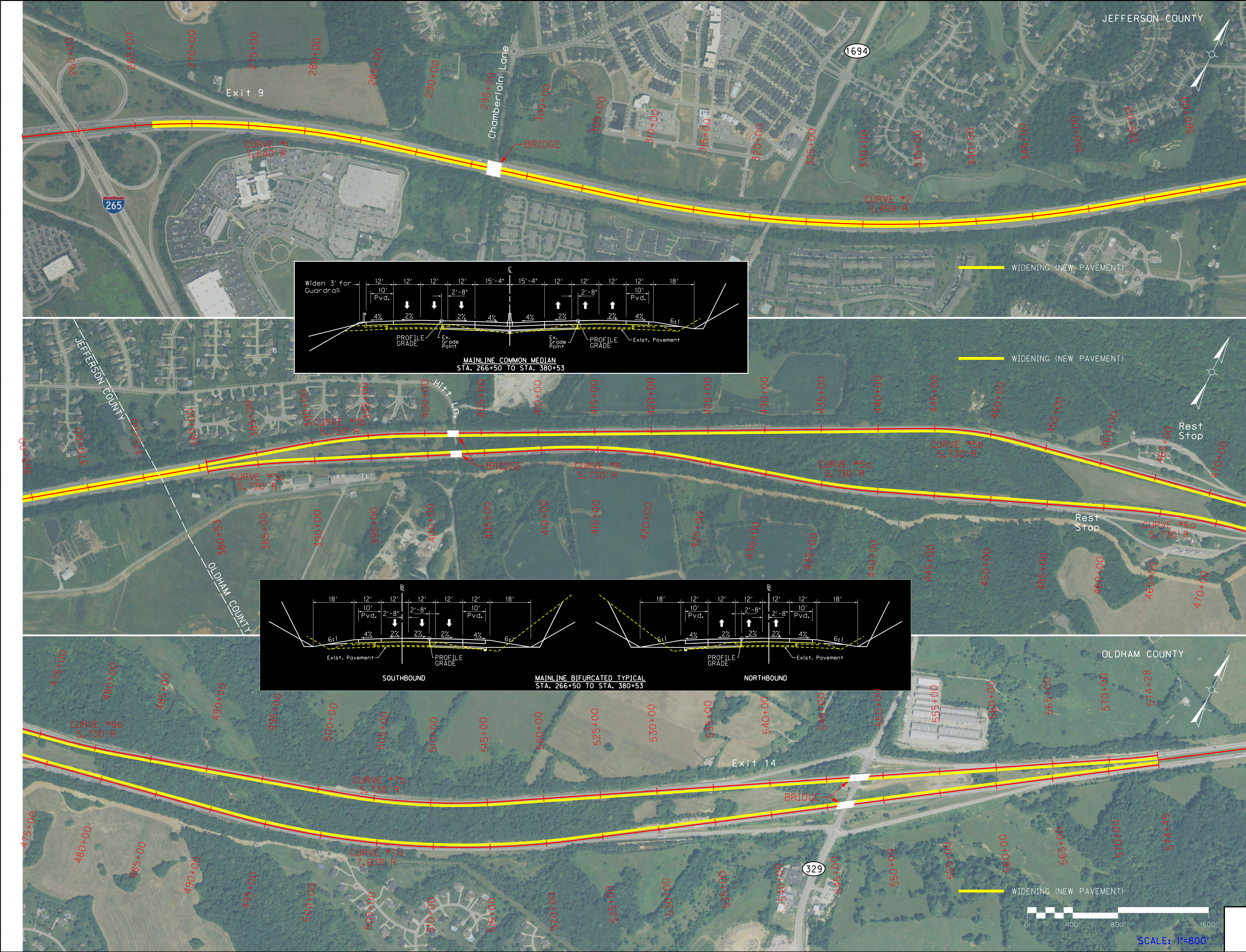
I-71 CORRIDOR STUDY
MM 39 SB TRUCK
CLIMBING LANE

COUNTY OF	ITEM NO.	SHEET NO.
JEFFERSON/ OLDHAM	99-394.00	

I-71 from I-265 to KY 329 (Exit 9 to Exit 14):
5.8 miles from MP 9.2 to MP 14.99
(Sta. 266+50 to Sta. 574+28)

- Improvements include the following:
- Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier (12 ft. inside shoulders for Bifurcated sections) and 6 - 12 ft. lanes with 12 ft. shoulders.
 - 6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.
 - Replacing 5 Bridge structures above Chamberlain Lane (1), N. Hitt Lane (2), KY 329 (2).
 - Cross slope correction for 70 mph design speed per 2011 AASHTO Geometric Design Policy. 6 curves have deficient cross slopes (1, 3a/b, 4, 5 a/b, 6 a/b, 7 a/b).

TOTAL COST: \$46,086,000



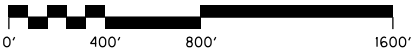
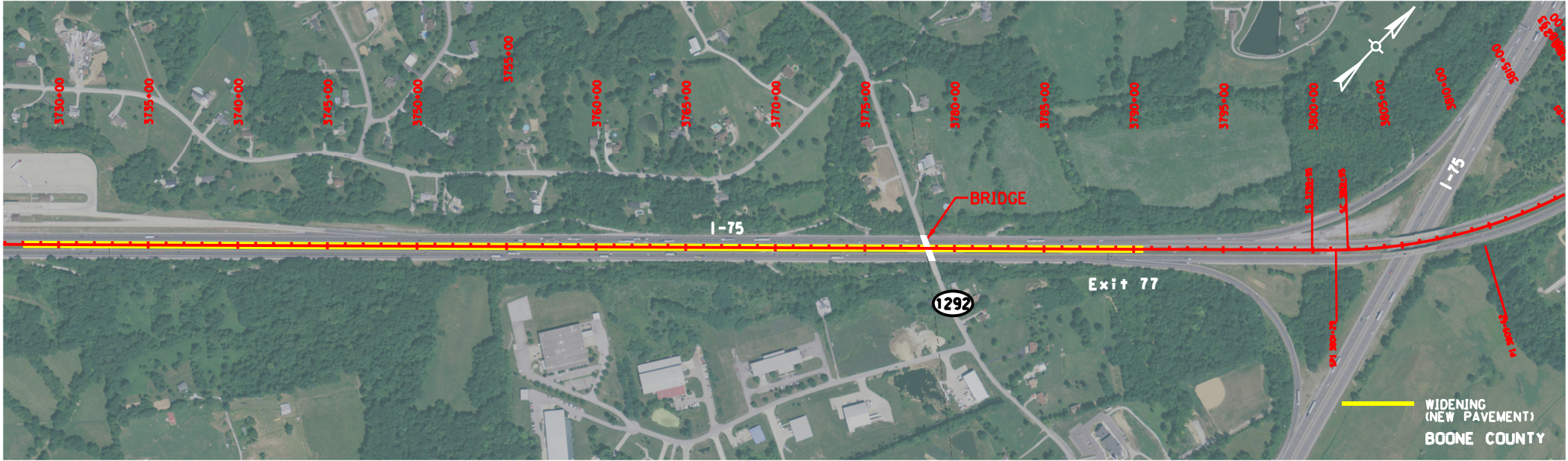
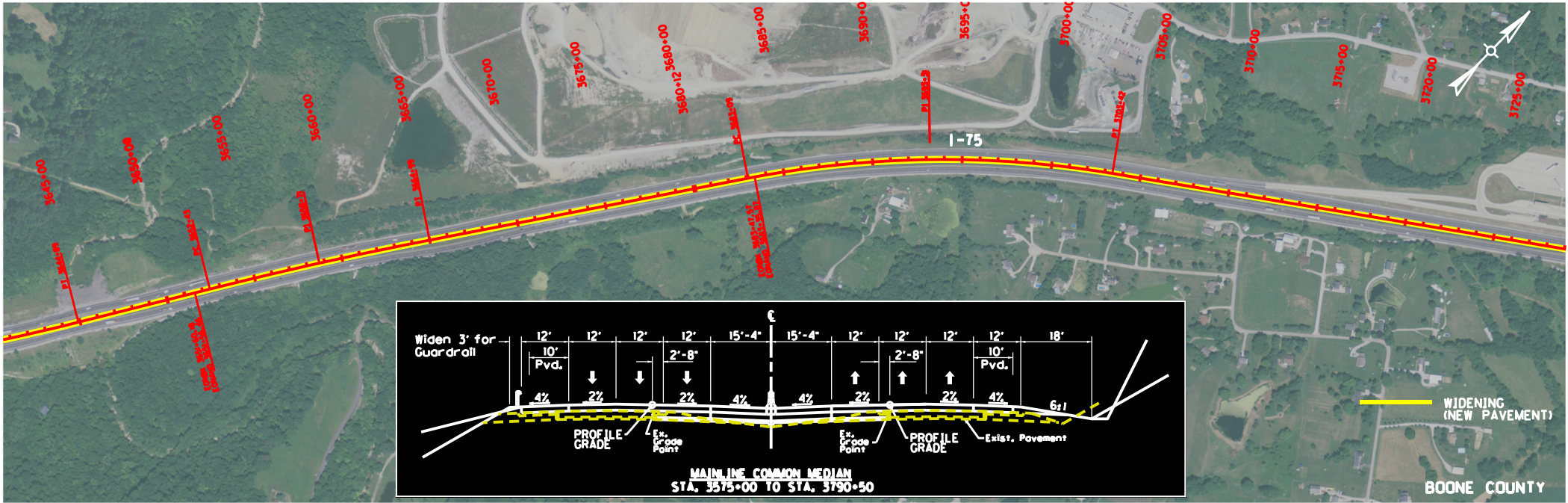
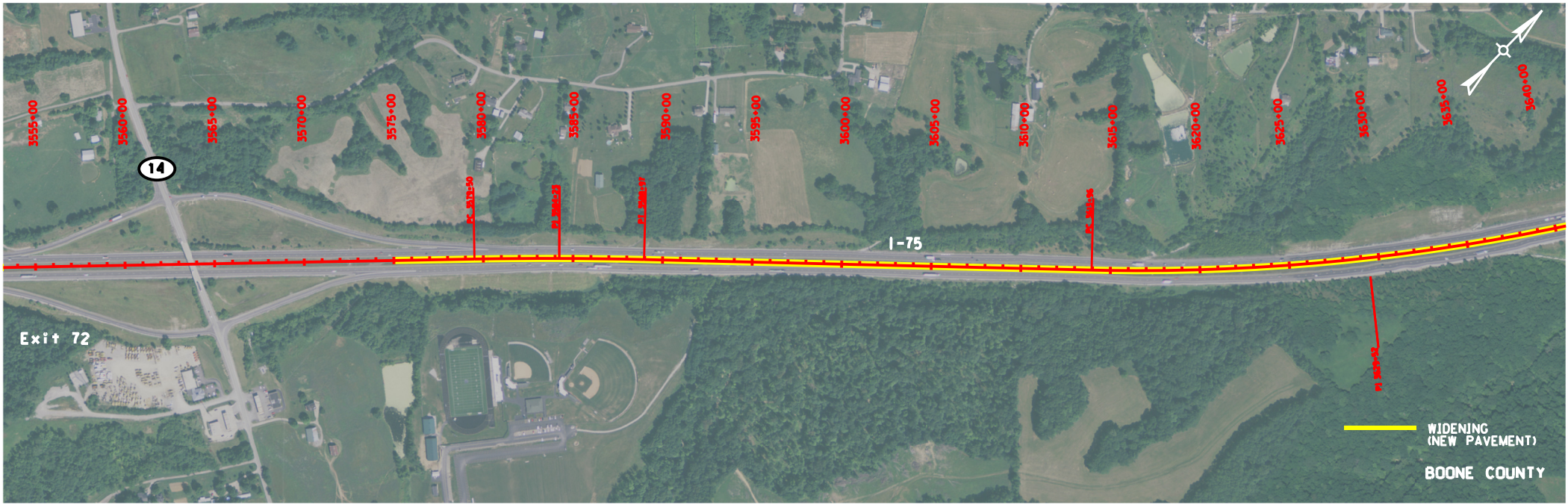
I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM I-265 TO KY 329

COUNTY OF	ITEM NO.	SHEET NO.
BOONE	99-394.00	

I-71 from KY 14 to I-75 (Exit 72 to Exit 77):
4.1 miles from MP 72.3 to MP 76.4
(Sta. 3575+00 to Sta. 3790+50)

- Improvements include the following:
- Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier and 6 - 12 ft. lanes with 12 ft. shoulders.
 - 6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.
 - Replacing 1 Bridge structure at Beaver Road, (KY 1292)

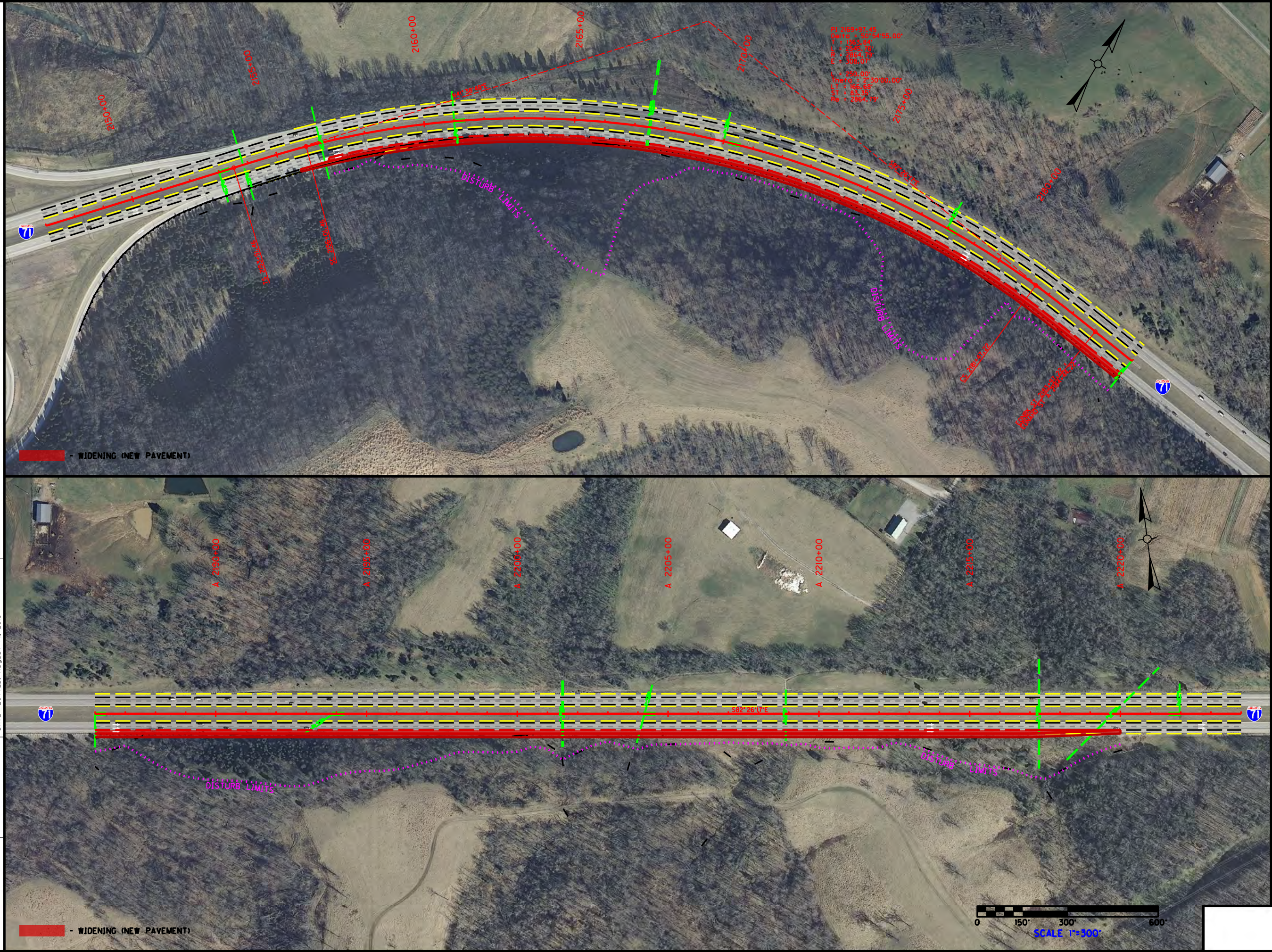
TOTAL COST: \$32,400,000



SCALE: 1"=800'

**I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM KY 14 TO I-75**

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COUNTY OF	ITEM NO.	SHEET NO.
CARROLL	99-394	

I-71 CORRIDOR STUDY
MM 44 NORTHBOUND
TRUCK CLIMBING LANE

COUNTY OF	ITEM NO.	SHEET NO.
OLDHAM	99-394.00	

I-71 from KY 329 to KY 146 (Exit 14 to Exit 17):
2.5 miles from MP 14.99 to MP 17.53
(Sta. 574+88 to Sta. 708+09)

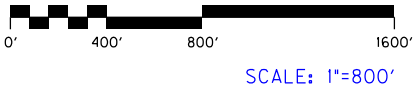
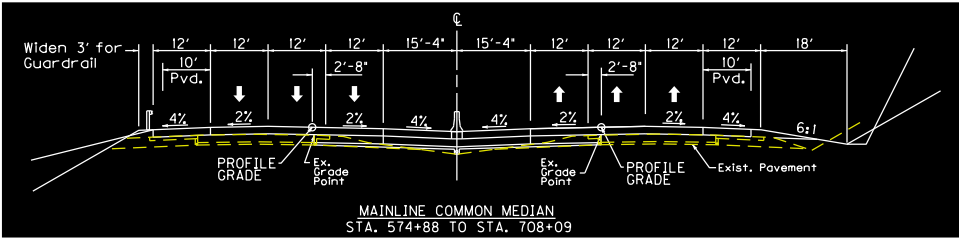
Improvements include the following:

Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier and 6 - 12 ft. lanes with 12 ft. shoulders.

6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.

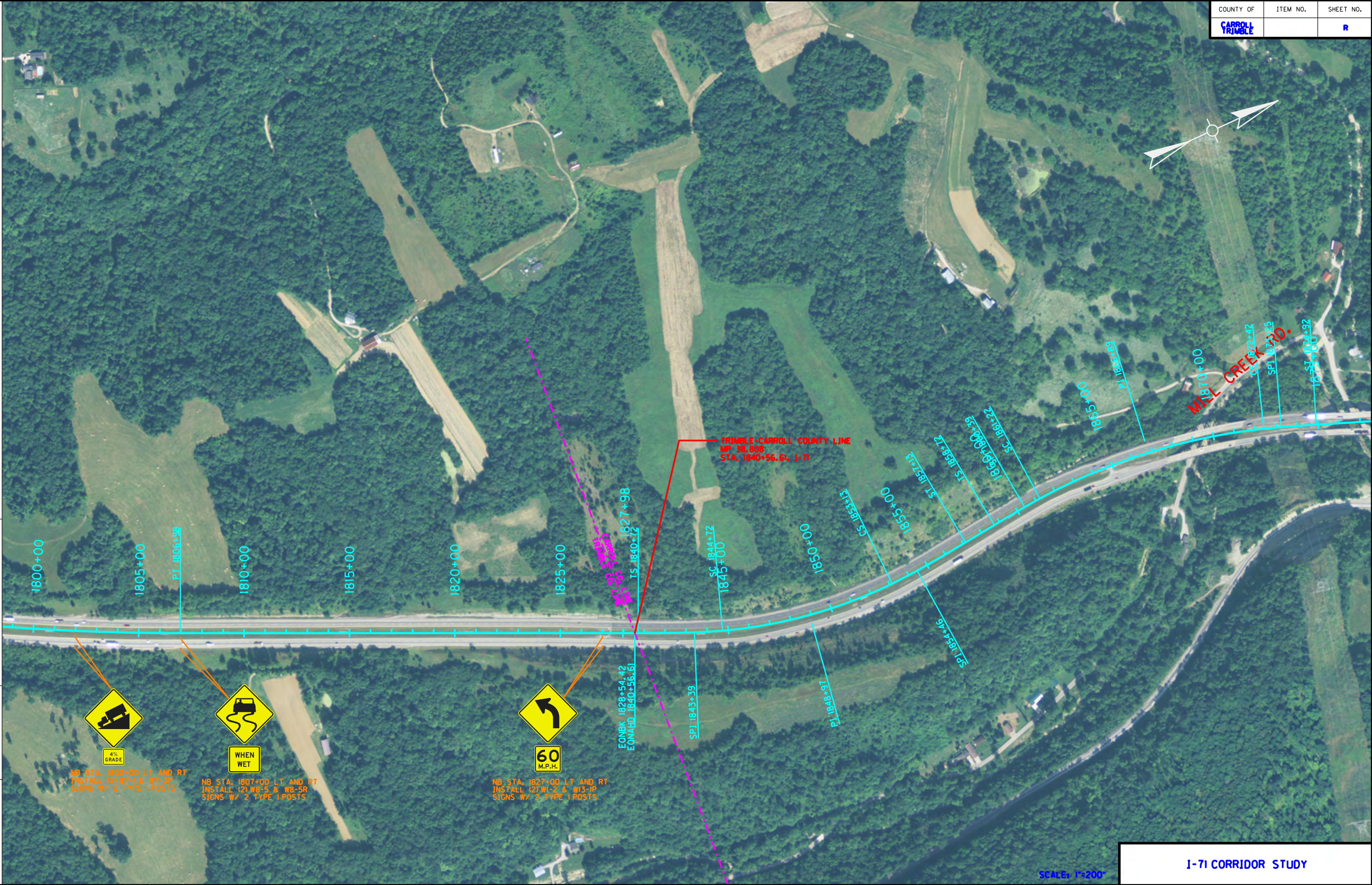
Replacing 3 Bridge overpass structures at Glenarm Road (1), KY 146 (1), and the CSX Railroad (1).

TOTAL COST: \$21,652,000



I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM KY 329 TO KY 146

COUNTY OF	ITEM NO.	SHEET NO.
CARROLL TRIMBLE		R



SCALE: 1"=200'

I-71 CORRIDOR STUDY

I-71 IMPROVEMENT PRIORITIES

1. Gallatin County North of US 127 MP 62.8 to MP 64.0

Purpose and Need:

The purpose of this project is to improve safety. The stretch of I-71 from MP 62.8 to MP 64.4 has six 0.1 mile spots where the Critical Crash Rate Factor (CCRF) exceeds 1.0. From years 2009-2011 there were 41 crashes in wet or snowy weather, 38 single vehicle run-off-the-road; 8 vehicle malfunction and 2 collisions with deer. Four were located within the spiral horizontal curve near MP 63.0. From January 1, 2013 to July 24, 2013 there have been more crashes in this stretch than all of year 2012. This is also following a complete pavement rehabilitation in 2011 to repair deficient cross slopes. Motorists must negotiate 4% grades leading to back to back spiral curves. In this area I-71 operates at Level of Service B; however, there are 25% trucks. These trucks speed up going downhill to climb the next 4% grade up hill. Many of them pass each other side by side causing vehicles to queue behind them. Discussions with the Gallatin County Sheriff's Office indicated that another issue is that semis stop at US 127/Glencoe exit to get fuel, and head northbound, sometimes spilling/dripping excess fuel onto I-71 creating a slick road. Since June 4, 2013 there have been 6 crashes in or near this location.

Improvement Options:

A curve reconstruction is proposed at MP 63.0

- A. Reconstruct to west – flatten curve by using special superelevation transition on south end.
- B. Reconstruct to west with retaining wall – same as A with wall to avoid channel change.
- C. Reconstruct to east – flatten curve by increasing previous curve radius on south end.
- D. Relocate I-71 between MP 63.40 and MP 64.5 (new length is 1.0 miles).

Preliminary Cost Estimates:

ALTERNATE A: Reconstruct to West

Phase	Year	Amount
Design	TBD	\$300,000
Right of Way	TBD	\$400,000
Utilities	TBD	\$200,000
Construction	TBD	\$3,000,000
Total		\$3,900,000

ALTERNATE B: Reconstruct to West with Retaining Wall

Phase	Year	Amount
Design	TBD	\$500,000
Right of Way	TBD	\$300,000
Utilities	TBD	\$200,000
Construction	TBD	\$4,700,000
Total		\$5,700,000

ALTERNATE C: Reconstruct to East

Phase	Year	Amount
Design	TBD	\$400,000
Right of Way	TBD	\$0
Utilities	TBD	\$100,000
Construction	TBD	\$3,600,000
Total		\$4,100,000

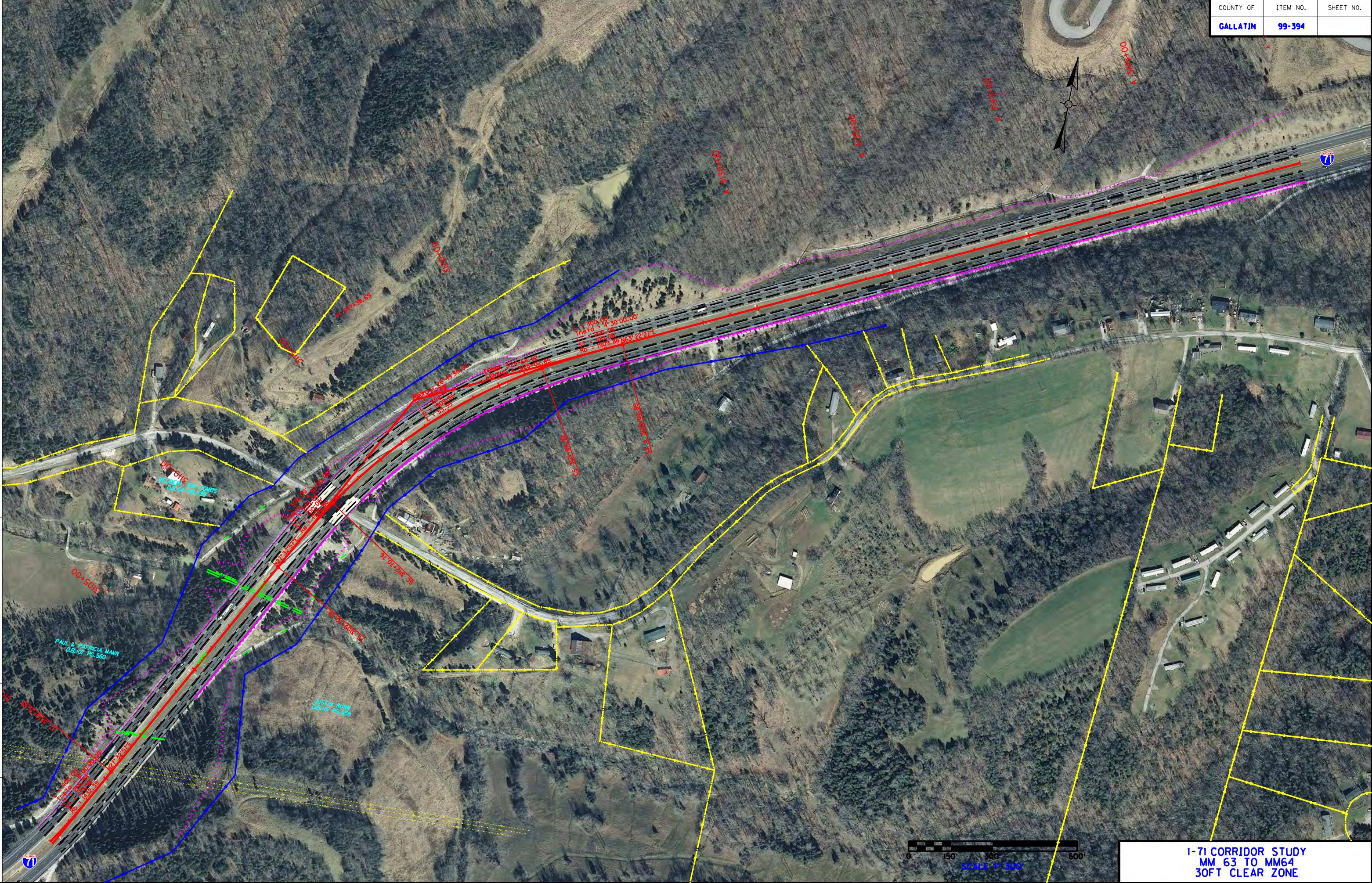
ALTERNATE D: Relocate I-71 between MP 63.4 and MP 66.05

Phase	Year	Amount
Design	TBD	\$2,200,000
Right of Way	TBD	\$1,500,000
Utilities	TBD	\$500,000
Construction	TBD	\$31,000,000
Total		\$35,200,000

Note: A 1 mile extension of Alternates A – C to improve the Clear Zone results in an additional cost of \$500,000.

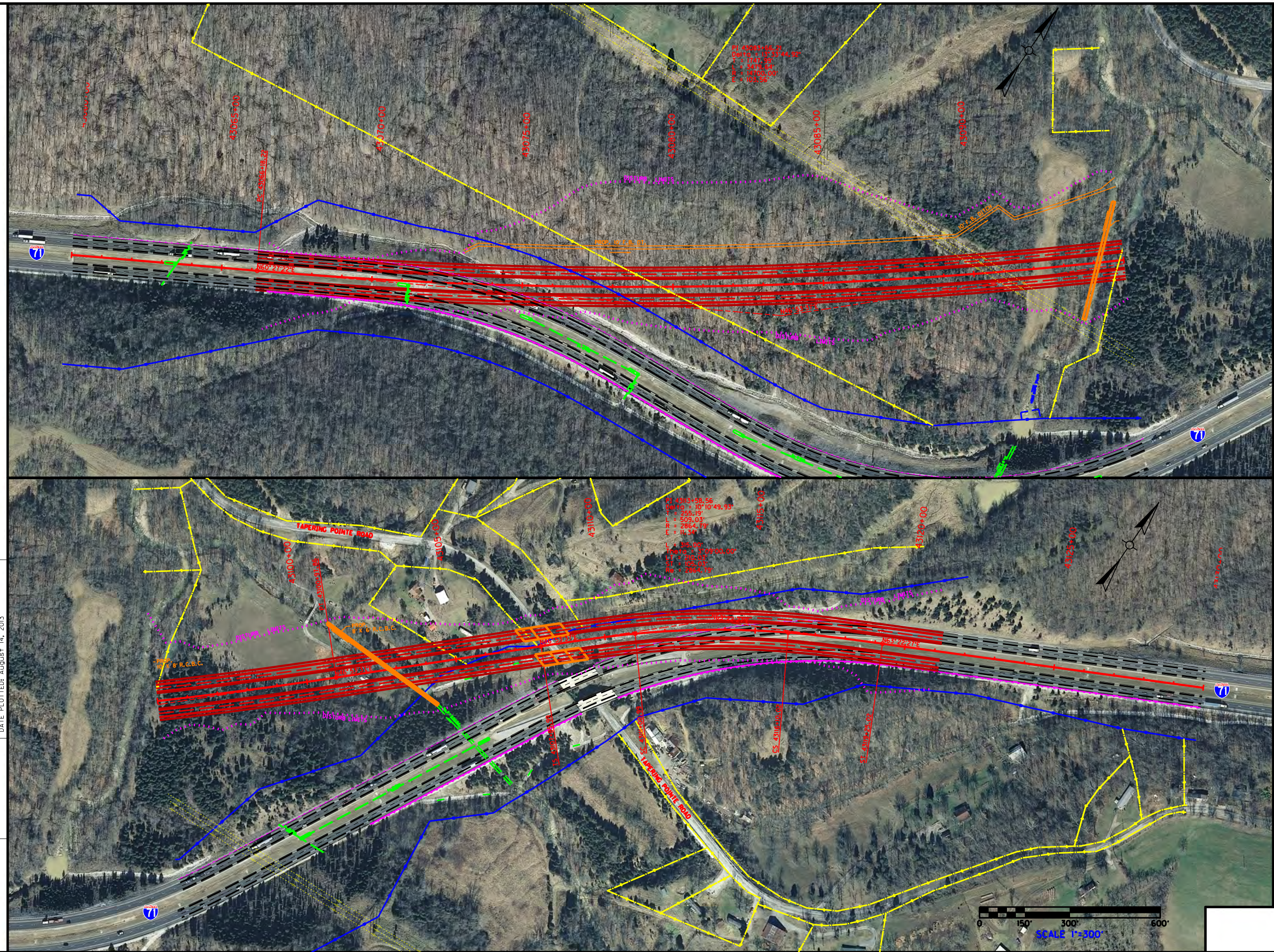
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DATE PLOTTED: August 14, 2013
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MicroStation v8.11.9.357

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63 TO MM 64
30FT CLEAR ZONE

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63
RELOCATION OPTION

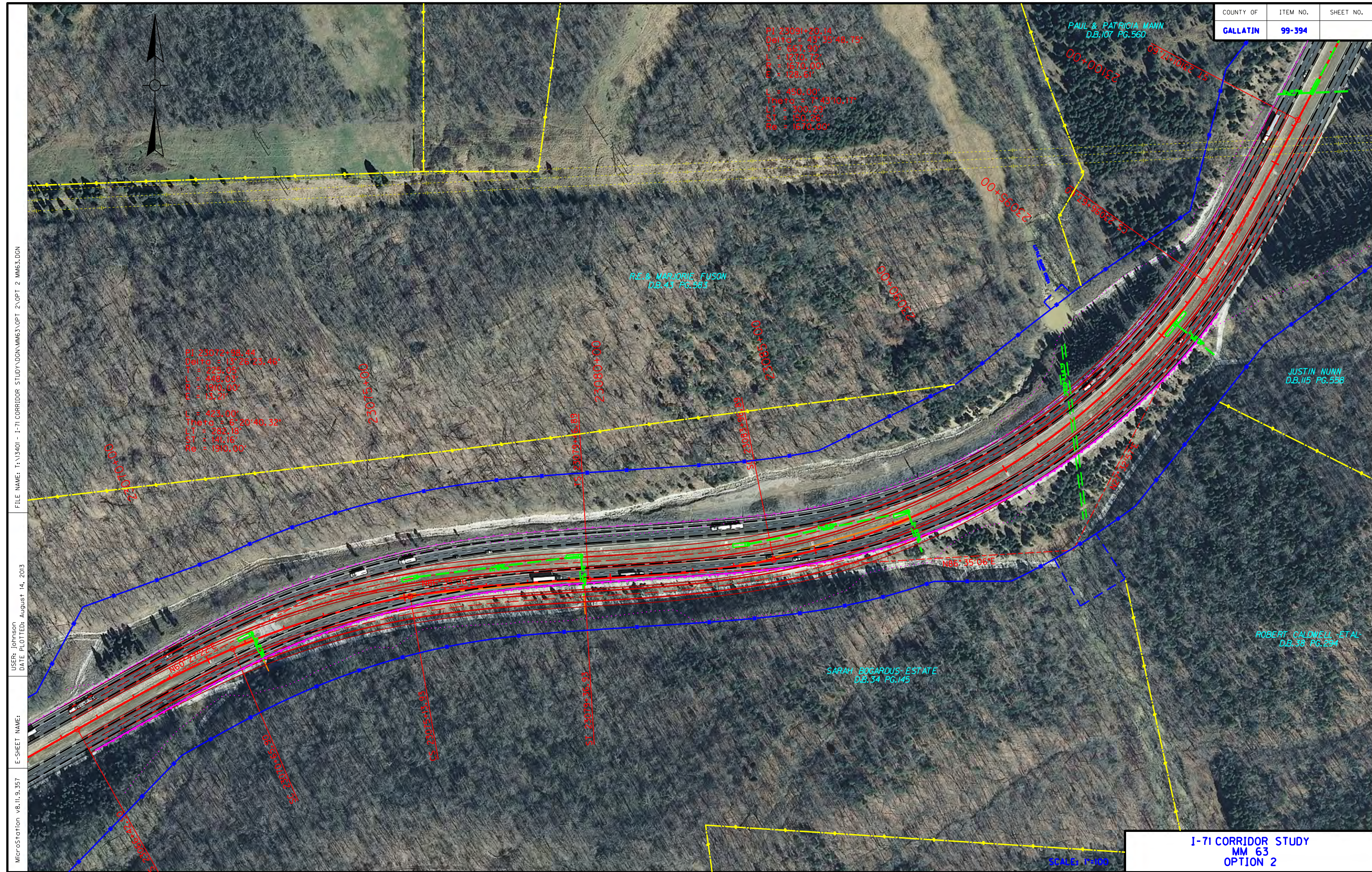
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DATE PLOTTED: August 14, 2013

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MicroStation v8.11.9.357

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	



COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	

JUSTIN NUNN
D.B.115 PG.558



PAUL & PATRICIA MANN
D.B.107 PG.560

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R.E. & MARJORIE FUSON
D.B. 43 PG. 583

P3 13074-16.24
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SARAH BOGARDUS- ESTATE
D.B.34 PG.145

ROBERT CALDWELL -ETAL-
D.B.38 PG.294

I-71 CORRIDOR STUDY
MM 63
OPTION 1 WITH WALL

SCALE: 1"=100'

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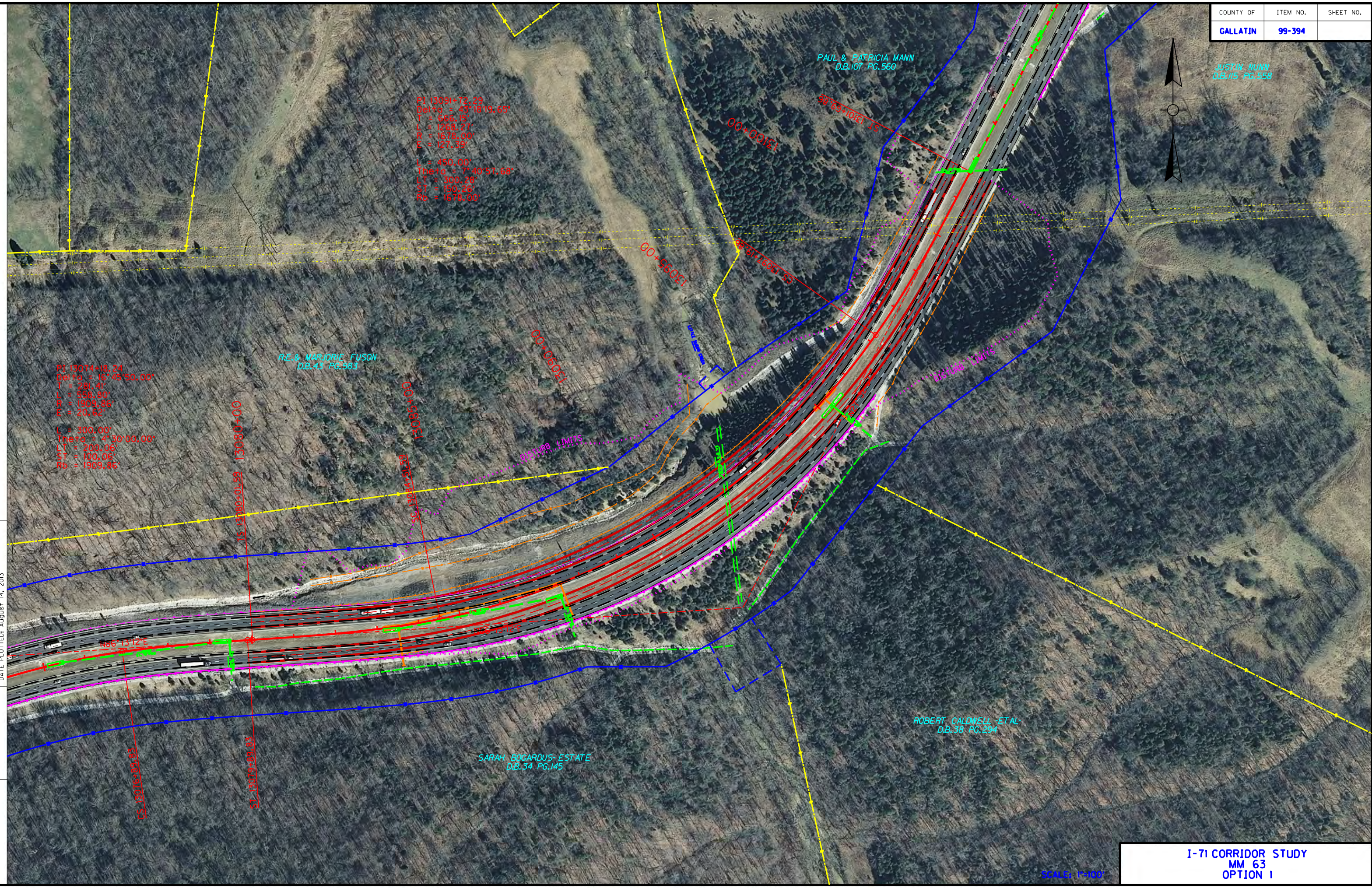
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GALLATIN	99-394	

JUSTIN MUNN
D.B.115 PG.558



I-71 CORRIDOR STUDY
MM 63
OPTION 1

2. **MP 38.9 to MP 39.1 in Carroll County, investigate what may be wrong at this location due to three fatalities in year 2012.**

Purpose and Need:

The purpose of this project is to improve safety. The initial evaluation of crashes in this area did not yield an area with any CCRF > 1.0. However, a quick check of the 2012 crashes revealed three fatalities in a 0.2 mile spot. Looking beyond this 0.2 mile spot, expanding 1.0 mile on either side, this area has multiple maximum 4% grades within back-to-back spiral curves, and two long narrow bridges at the end of a 3% downgrade heading northbound. The reverse is the case travelling southbound, there is a continuous uphill climb for approximately 2.5 miles beginning at approximately MP 38.3 to MP 40.8, with grades ranging from -0.5% to -4.0% and a possible deficient sag curve. The equivalent southbound grade was 3.62% for 2.33 miles. This length, according to the design manual and field observation, slows trucks by nearly 30 mph increasing the crash involvement rate by nearly five times. Many truck drivers use their flashers to warn other motorists of their slow speeds. This segment has a current year (2013) volume of 29,800 vpd and is estimated to carry 50,240 in 2038. When crashes are analyzed one mile on either side of this spot, the numbers of crashes seem to be on the rise beginning in 2012.

Total Crashes		
Year	MP 38.9 to 39.1	MP 37.9 to 40.1
2009	1	13
2010	2	12
2011	0	5
2012	3(see table below)	19
2013 (first 7 months)	2	9

There have been three fatal crashes in Carroll County MP 38.9 to MP 39.1 in 2012:

	NB to SB Crash on 1/28/2012	NB Crash on 7/15/2012	NB Crash on 11/5/2012
Time of Day	2:20 a.m.	6:35 p.m.	7:35 p.m.
Sun Issue	No	No	No
Bridge involvement	No	No	No
Basic summary	Driver lost control changing lanes on downgrade.	Driver swerved to avoid debris in road; lost control.	Failed to negotiate horizontal curve.
Other	Not wearing belt, but may have still been fatality if had been.	Drive under influence of prescription drugs.	Perhaps not fatal if wearing seatbelt.
	Wet weather	Dry weather	Dry weather

Improvement:

Add truck climbing lane in southbound direction.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$600,000
Right of Way	TBD	\$100,000
Utilities	TBD	\$200,000
Construction	TBD	\$7,000,000
Total		\$7,900,000

3. Add Capacity from I-265 to KY 329 in Jefferson/Oldham County (5.8 Miles)

Purpose and Need:

The purpose of this project is to improve congestion and safety on I-71. Currently I-71 from I-64 in downtown Louisville to KY 329 is operating at LOS F with v/c ratios exceeding 1.0 in the PM peak hour and truck percentages varying from 7% to 18%. There are also multiple areas where the Critical Crash Rate Factor exceeds 1.0 indicating that crashes at those locations exceed the crash rate for similar roadways in Kentucky.

Improvement:

Widen I-71 from four to six lanes and widen clear zone to current criteria.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$3,500,000
Right of Way	TBD	\$0
Utilities	TBD	\$700,000
Construction	TBD	\$50,000,000
Total		\$54,200,000

COUNTY OF	ITEM NO.	SHEET NO.
JEFFERSON/ OLDHAM	99-394.00	

I-71 from I-265 to KY 329 (Exit 9 to Exit 14):
5.8 miles from MP 9.2 to MP 14.99
(Sta. 266+50 to Sta. 574+28)

- Improvements include the following:
- Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier (12 ft. inside shoulders for Bifurcated sections) and 6 - 12 ft. lanes with 12 ft. shoulders.
 - 6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.
 - Replacing 5 Bridge structures above Chamberlain Lane (1), N. Hitt Lane (2), KY 329 (2).
 - Cross slope correction for 70 mph design speed per 2011 AASHTO Geometric Design Policy. 6 curves have deficient cross slopes (1, 3a/b, 4, 5 a/b, 6 a/b, 7 a/b).

TOTAL COST: \$46,086,000



4. KY 14 to I-75 Capacity Addition in Boone County (4.1 miles)

Purpose and Need:

The purpose of this project is to improve safety and congestion. A safety analysis based on crash data for the years 2009 – 2011 indicated a potential concern in the vicinity of the KY 14 interchange between MP 71.6 and MP 72.6. Five separate 0.1 mile spots within this one mile section had CCRFs ranging from 0.96 to 2.58. A review of crash reports were dominated by crashes that reflected conditions before or during roadway reconstruction. Kentucky State Police data between MP 71.6 and MP 72.6 was then searched with the following results:

Year	2009	2010	2011	2012	2013*
Number of Crashes	12	15	17	9	7

*Through July 31, 2013

The number of crashes occurring after construction appears to have declined relative to those that occurred prior to or during construction. Thus, there appears to be no safety component of the Purpose and Need of this proposed improvement.

Capacity analyses of current conditions indicated acceptable operation conditions:

2013	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	B	B	C	C
FFS	74.6			
Capacity (vphpl)	2446			
Flow Rate (pc/h/ln)	1092	1153	1459	1413
V/C	0.45	0.47	0.60	0.58

Design year capacity analyses indicate that 2038 volumes will result in LOS D, both northbound and southbound, in the pm peak period with volume-to-capacity ratios exceeding 0.8.

2038	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	C	C	D	D
FFS	74.6			
Capacity (vphpl)	2446			
Flow Rate (pc/h/ln)	1596 pc/h/ln	1681	2127	2063
V/C	0.65	0.69	0.87	0.84

Improvement:

To improve congestion it is recommended that this section of I-71 be widened from four to six lanes.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$2,000,000
Right of Way	TBD	\$0
Utilities	TBD	\$400,000
Construction	TBD	\$30,000,000
Total		\$32,400,000

COUNTY OF	ITEM NO.	SHEET NO.
BOONE	99-394.00	

I-71 from KY 14 to I-75 (Exit 72 to Exit 77):
4.1 miles from MP 72.3 to MP 76.4
(Sta. 3575+00 to Sta. 3790+50)

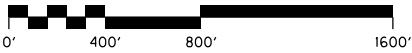
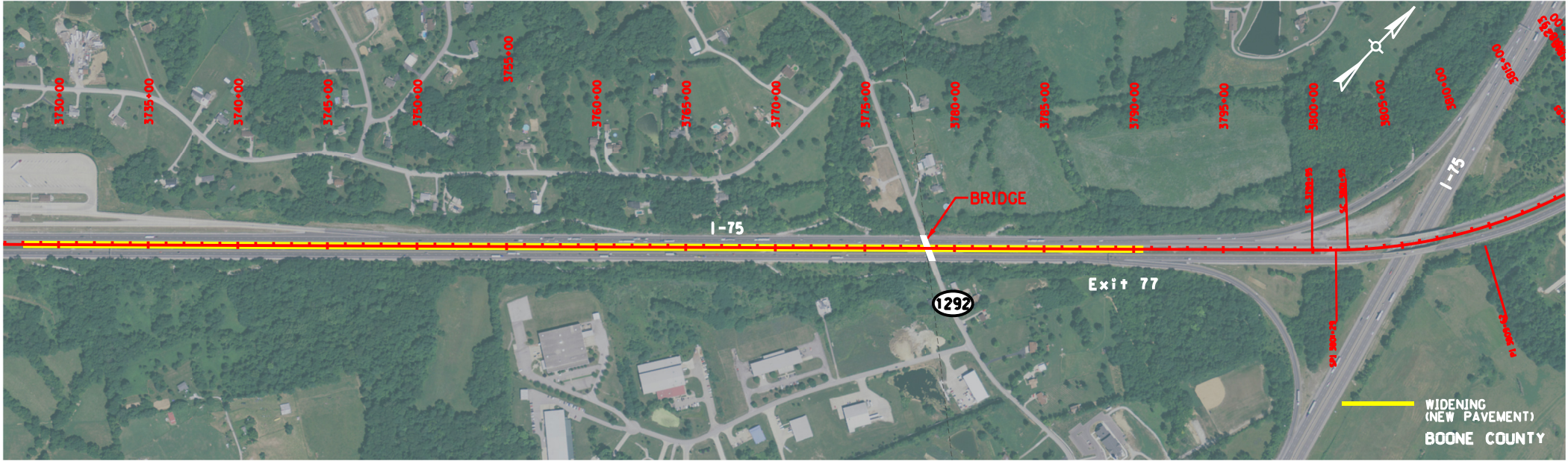
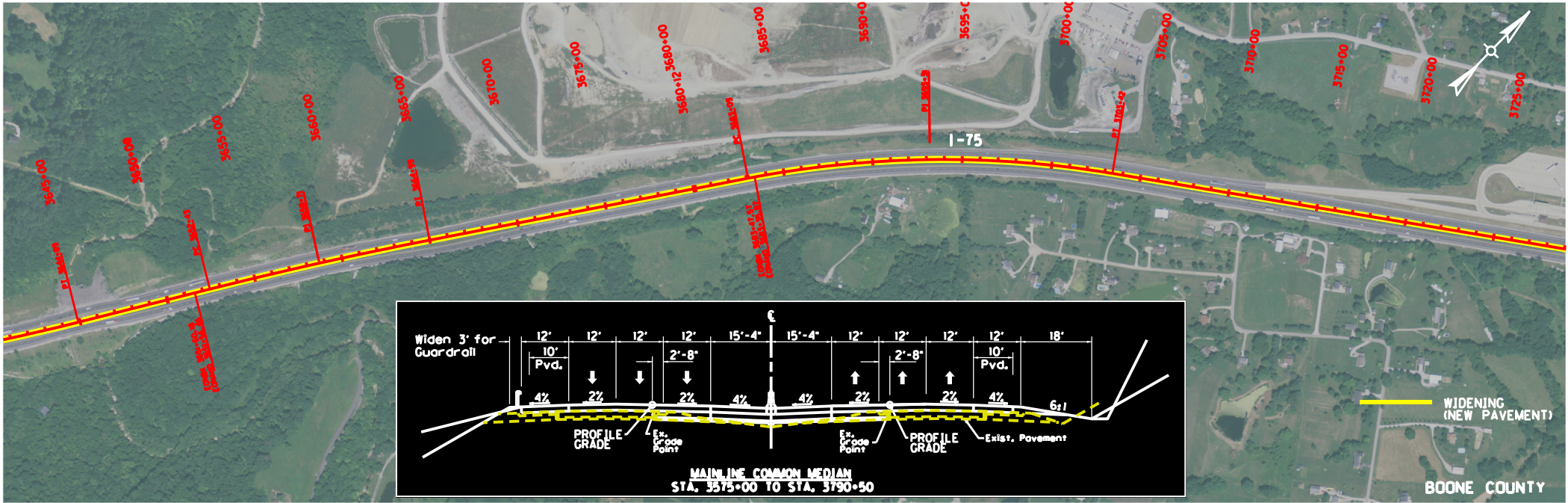
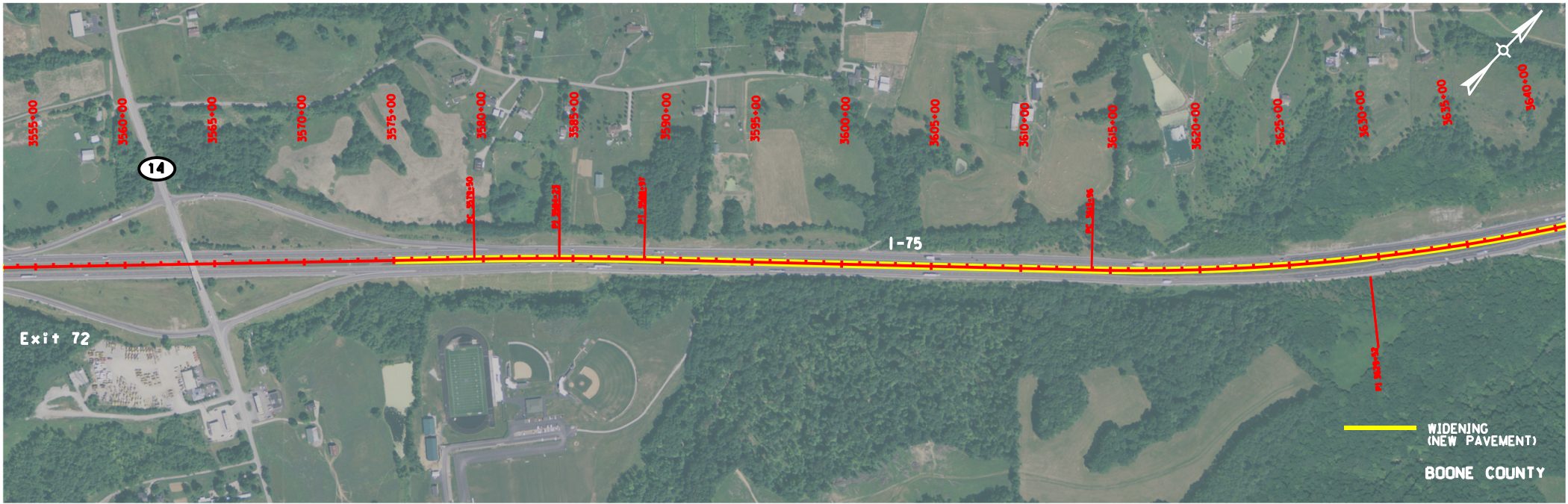
Improvements include the following:

Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier and 6 - 12 ft. lanes with 12 ft. shoulders.

6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.

Replacing 1 Bridge structure at Beaver Road, (KY 1292)

TOTAL COST: \$32,400,000



SCALE: 1"=800'

**I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM KY 14 TO I-75**

5. Truck Climbing Lane for KY 227 North (1.2 miles)

Purpose and Need:

The purpose of this project is to improve safety. A 4,850 foot-long grade northbound begins just east of the KY 227 interchange. A 2° horizontal curve characterizes the segment nearest the KY 227 interchange. In 2012 there were 33.2% trucks. More than 9,700 trucks currently utilize this roadway segment with that number expected to grow. “Trucks passing trucks” construct the free flow speed in the fast lane. This length, according to the design manual and field observation, slows trucks by over 25 mph increasing the crash involvement rate by nearly five times. Many truck drivers use their flashers to warn other motorists of their slow speeds. Also, the length of the current acceleration ramp from KY 227 to northbound I-71 is 124’ short of the desired length under current design standards.

Improvement:

It is recommended that a truck climbing lane begin at the merge point for the northbound entrance ramp (approximately MP 44.8) and continue until tapering back in near MP 46.1.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$400,000
Right of Way	TBD	\$0
Utilities	TBD	\$100,000
Construction	TBD	\$5,000,000
Total		\$5,500,000

6. KY 329 – KY 146 in Oldham County (2.5 miles)

Purpose and Need:

The purpose of this project is to improve congestion. Crashes do not appear to be a problem in the section; the CCRF is only 0.43. No 0.1-mile spot in this section has a CCRF exceeding, or even approaching, 1.0. (The highest CCRF is 0.69 between MP 16.96 and MP 17.06). However, this section is already congested, especially in the afternoon peak period. The following metrics characterize the current conditions in the section between KY 329 and KY 146:

2013	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	C	C	F	D
FFS	73.0			
Capacity (vphpl)	2430			
Flow Rate (pc/h/ln)	1637	1722	2731	2103
V/C	0.67	0.71	1.12	0.87

Capacity analyses indicate that 2038 volumes will result in lower Levels of Service (LOS) (except northbound in the afternoon peak period which is already operating at LOS F and would continue to do so) and higher V/C ratios. The following metrics characterize the Year 2038 conditions in the section between KY 329 and KY 146:

2038	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	D	E	F	F
FFS	73.0			
Capacity (vphpl)	2430			
Flow Rate (pc/h/ln)	2103	2215	3493	2695
V/C	0.87	0.91	1.44	1.11

Improvement:

To improve congestion it is recommended that this section I-71 be widened from four to six lanes. A continuous additional lane will be carried between exits 17 and 18 to address weaving issues.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$1,500,000
Right of Way	TBD	\$0
Utilities	TBD	\$300,000
Construction	TBD	\$20,000,000
Total		\$21,800,000

FILE NAME: U:\13401 - I-71 CORRIDOR STUDY\ROADWAY PLANS\146 TO 329.DGN
USER: adille
DATE PLOTTED: August 15, 2013
E-SHEET NAME:
MicroStation v8.11.7.443

COUNTY OF	ITEM NO.	SHEET NO.
OLDHAM	99-394.00	

I-71 from KY 329 to KY 146 (Exit 14 to Exit 17):
2.5 miles from MP 14.99 to MP 17.53
(Sta. 574+88 to Sta. 708+09)

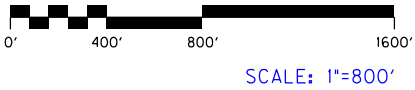
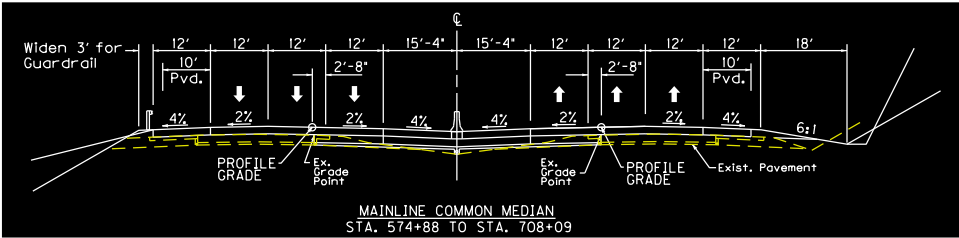
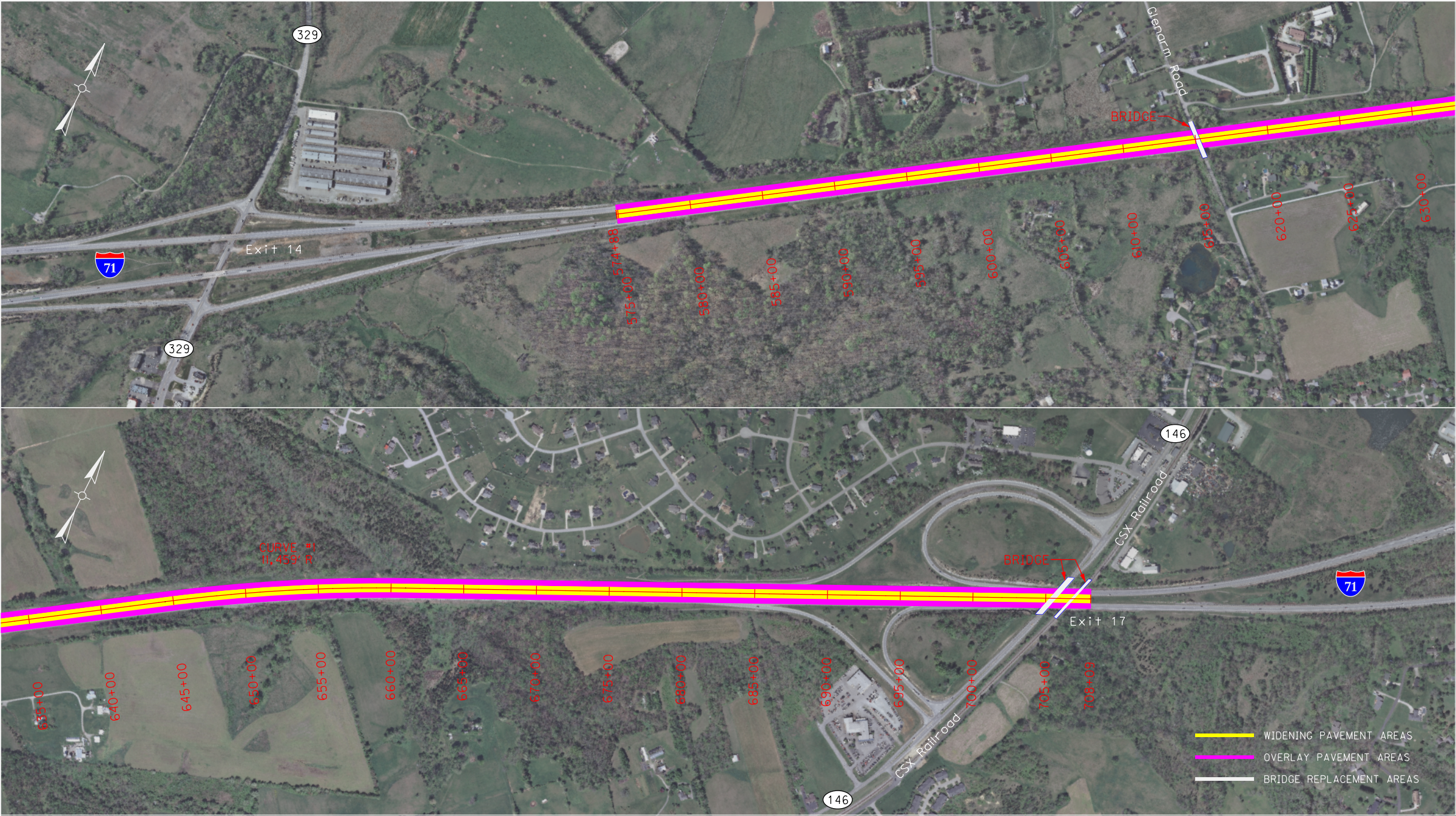
Improvements include the following:

Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier and 6 - 12 ft. lanes with 12 ft. shoulders.

6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.

Replacing 3 Bridge overpass structures at Glenarm Road (1), KY 146 (1), and the CSX Railroad (1).

TOTAL COST: \$21,652,000



I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM KY 329 TO KY 146

Minor Improvement Options (Quick wins)

At present, there are a few quick wins that could also be considered. Additional quick wins will be available in October.

1. Cable Guardrail:

A review of crossover crashes, existing cable guardrail locations, relevant location to the above crash concerns, and consultation with KYTC, the following locations are recommended for cable guardrail:

HEAD ON Crashes 2009-2011					
	MP	KYTC Plans or Conditions	NB	SB	Crash type
Oldham	11.905	bifurcated		x	Collision with fixed object
Oldham	12.605	bifurcated	x		Head on; dark not lighted
Oldham	13.384	bifurcated	x		Head on; wet
Oldham	14.924	bifurcated		x	Collision with fixed object
Oldham	16.991	2013 letting		x	Vehicle going wrong direction
Oldham	17.209	2013 letting		x	Head on
Henry	25.963	None		x	Occ fell from moving vehicle
Henry	27.15	None	x		Head on
Henry	29.797	None		x	Occupant fell from moving vehicle
Carroll	39.603	None	x		Occupant fell from moving vehicle
Carroll	40.497	None	x		Occupant fell from moving vehicle curve and grade
Carroll	50.375	None		x	Occupant fell from moving vehicle
Carroll	50.54	None		x	Vehicle going wrong direction
Gallatin	57.348	None		x	Collision with nonfixed object
Gallatin	62.92	Existing cable		x	Vehicle leaving or entering parked position
Gallatin	63.197	Existing cable		x	Collision with fixed object? Raining
Boone	69.899	On list to do whole county not funded	x		Head on; raining
Boone	70.381	On list to do whole county not funded		x	Dark, head on, dry and clear
Boone	70.584	On list to do whole county not funded	x		Dark, not lighted, clear and dry
Boone	72.538	On list to do whole county not funded	x		Head on; raining
Boone	75.669	On list to do whole county not funded	x		Straight and level; dry and clear

Recommendations	Beg MP	End MP	Priority	Cost \$150,000/MI
Boone County	70	78	1	\$1,200,000
Carroll County	43.9	46.9	2	\$450,000
Oldham County	22.536	23.427	3	\$133,650
Henry County	25.769	27.383	4	\$242,100
Henry County	30.97	33.052	5	\$312,300

2. Signal on KY 146 on North Side of I-71 Interchange:

The purpose of this quick win is to improve congestion at the KY 146/I-71 Interchange ramp terminals. The NB ramps on the south side of the KY 146/I-71 interchange are controlled by a traffic signal. The southbound ramps on the north side the KY146/ I-71 interchange are not controlled by a traffic signal, but warrants for a signal are met at that location. Crashes do not appear to be a problem.

Without Signal			With Signal	
KY 146 @ SB Ramps	Approach Delay (secs)	LOS Without Signal	Approach Delay (secs)	LOS With Signal
AM Peak Period	538	F	22	C
PM Peak Period	165	F	26	C

As shown above, signalizing that location (and coordinating that signal with the one currently on the south side of the interchange) appears to improve congestion levels. The estimated cost of installing this signal and interconnecting it with the one currently on the south side of the KY 146/I-71 interchange is \$150,000.

3. Signal on KY 329 on North Side of I-71 Interchange and Crossroad Left Turn Lane

Currently, the I-71/KY 329 ramp terminals for turns from I-71 to KY 329 operate at LOS E and F in the peak hours. There are no left turn lanes under the bridge, and there are steep downgrades in both directions toward the ramp terminals. The hourly volumes for the left turns from I-71 at the NB ramp terminal are only 70/80 vpd in the AM/PM peak hours.

Although both ramp terminals meet signal warrants, it is recommended that only one signal be installed at the SB ramps. However, to operate at an acceptable LOS, due to the KY 329 lefts onto NB I-71, a left turn lane is needed at that location. The cost estimate for this improvement is \$1,000,000.

4. Additional Signage (MP 38 to 39)

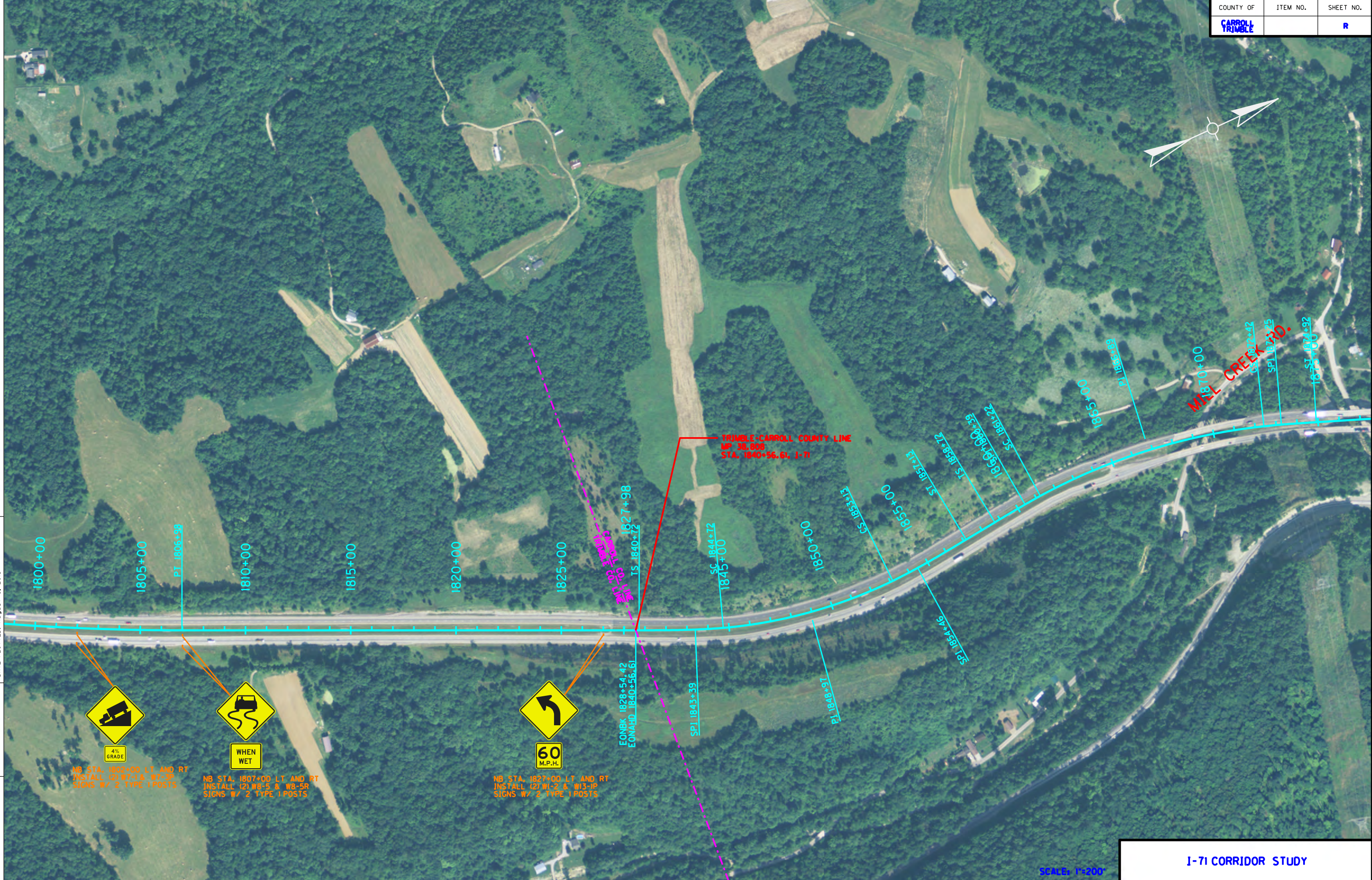
Because of the recent accident history, the exhibit on the following page shows where additional signs could be added to improve safety.

- Both sides of road – add slick pavement signs
- NB down grade is 4% and there is a 2.5 degree curve – add curve warning sign and a downgrade sign for trucks.

The approximate cost for this improvement is \$10,000.

MicroStation v8.11.7.443 E-SHEET NAME: USER: cpodgett DATE PLOTTED: August 9, 2013 FILE NAME: U:\13401 - I-71 CORRIDOR STUDY\EXISTING CONDITIONS\EXISTING PLANS\SIGNING\STA. 1800+00.1870+00.DGN

COUNTY OF	ITEM NO.	SHEET NO.
CARROLL TRIMBLE		R



I-71 IMPROVEMENT PRIORITIES

1. Gallatin County North of US 127 MP 62.8 to MP 64.0

Purpose and Need:

The purpose of this project is to improve safety. The stretch of I-71 from MP 62.8 to MP 64.4 has six 0.1 mile spots where the Critical Crash Rate Factor (CCRF) exceeds 1.0. From years 2009-2011 there were 41 crashes in wet or snowy weather, 38 single vehicle run-off-the-road; 8 vehicle malfunction and 2 collisions with deer. Four were located within the spiral horizontal curve near MP 63.0. From January 1, 2013 to July 24, 2013 there have been more crashes in this stretch than all of year 2012. This is also following a complete pavement rehabilitation in 2011 to repair deficient cross slopes. Motorists must negotiate 4% grades leading to back to back spiral curves. In this area I-71 operates at Level of Service B; however, there are 25% trucks. These trucks speed up going downhill to climb the next 4% grade up hill. Many of them pass each other side by side causing vehicles to queue behind them. Discussions with the Gallatin County Sheriff's Office indicated that another issue is that semis stop at US 127/Glencoe exit to get fuel, and head northbound, sometimes spilling/dripping excess fuel onto I-71 creating a slick road. Since June 4, 2013 there have been 6 crashes in or near this location.

Improvement Options:

A curve reconstruction is proposed at MP 63.0

- A. Reconstruct to west – flatten curve by using special superelevation transition on south end.
- B. Reconstruct to west with retaining wall – same as A with wall to avoid channel change.
- C. Reconstruct to east – flatten curve by increasing previous curve radius on south end.
- D. Relocate I-71 between MP 63.40 and MP 64.5 (new length is 1.0 miles).

Preliminary Cost Estimates:

ALTERNATE A: Reconstruct to West

Phase	Year	Amount
Design	TBD	\$300,000
Right of Way	TBD	\$400,000
Utilities	TBD	\$200,000
Construction	TBD	\$3,000,000
Total		\$3,900,000

ALTERNATE B: Reconstruct to West with Retaining Wall

Phase	Year	Amount
Design	TBD	\$500,000
Right of Way	TBD	\$300,000
Utilities	TBD	\$200,000
Construction	TBD	\$4,700,000
Total		\$5,700,000

ALTERNATE C: Reconstruct to East

Phase	Year	Amount
Design	TBD	\$400,000
Right of Way	TBD	\$0
Utilities	TBD	\$100,000
Construction	TBD	\$3,600,000
Total		\$4,100,000

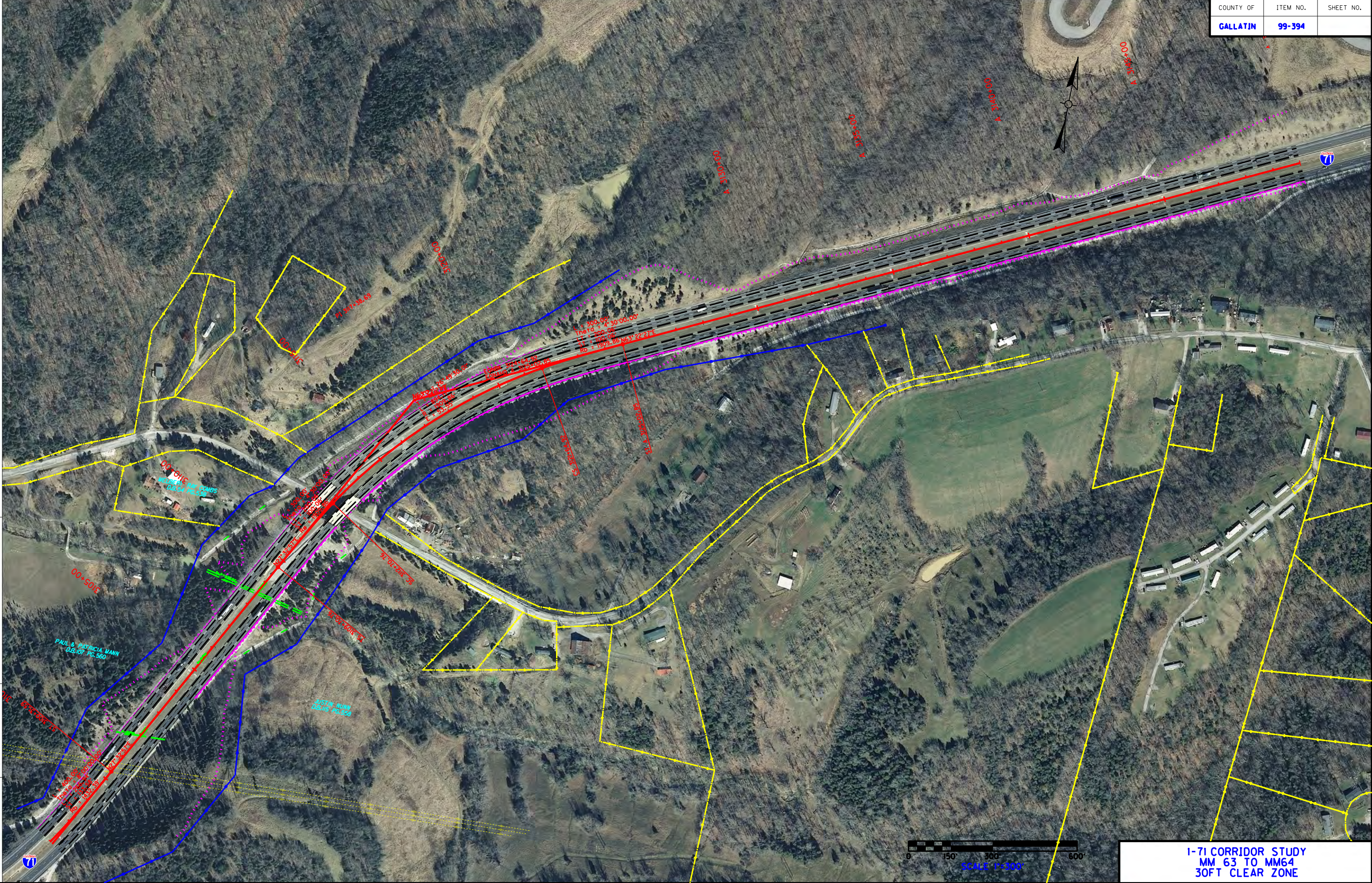
ALTERNATE D: Relocate I-71 between MP 63.4 and MP 66.05

Phase	Year	Amount
Design	TBD	\$2,200,000
Right of Way	TBD	\$1,500,000
Utilities	TBD	\$500,000
Construction	TBD	\$31,000,000
Total		\$35,200,000

Note: A 1 mile extension of Alternates A – C to improve the Clear Zone results in an additional cost of \$500,000.

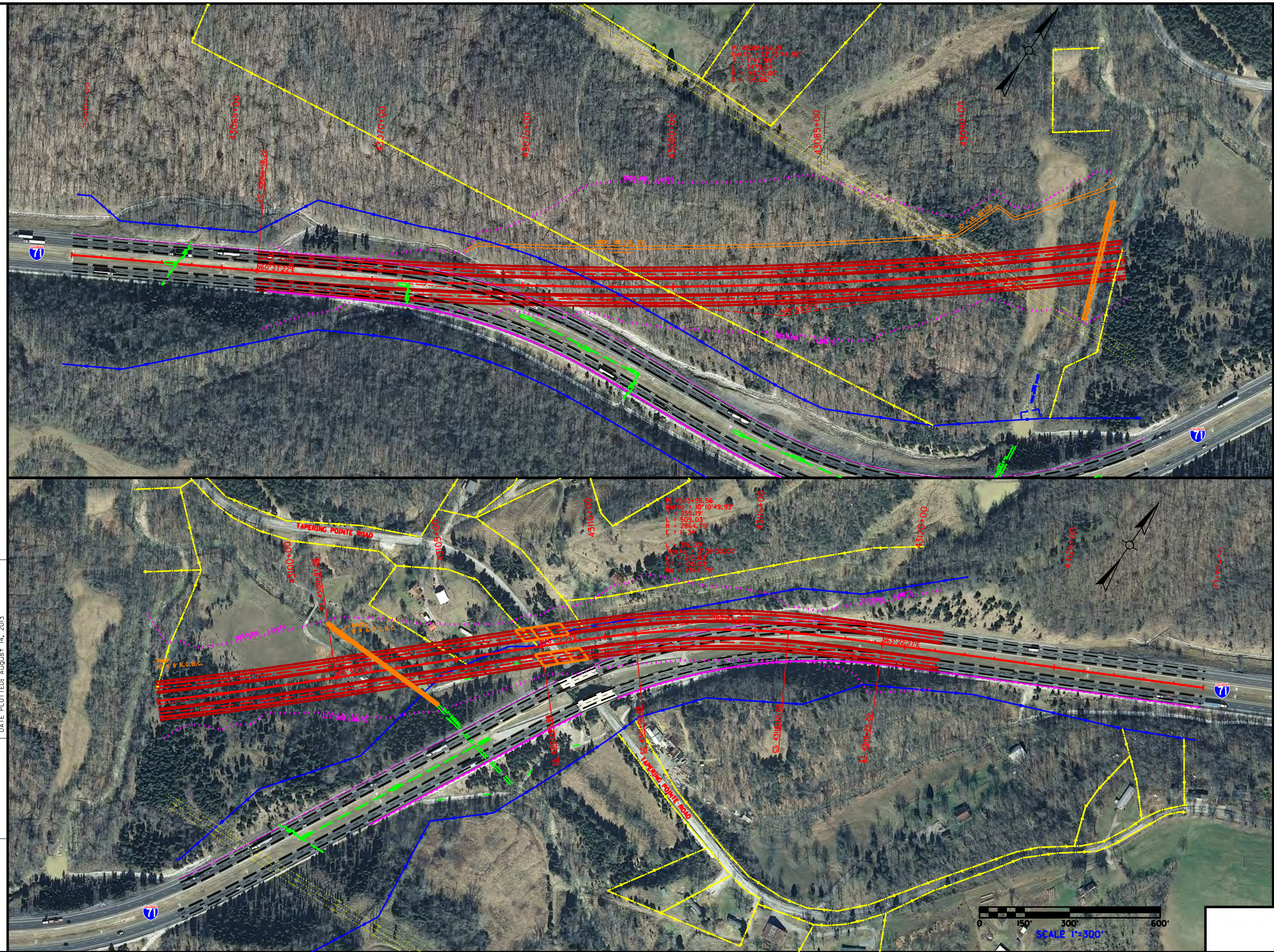
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USER: Johnson
DATE PLOTTED: August 14, 2013
E-SHEET NAME:
MicroStation v8.11.9.357

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63 TO MM64
30FT CLEAR ZONE

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	

I-71 CORRIDOR STUDY
MM 63
RELOCATION OPTION

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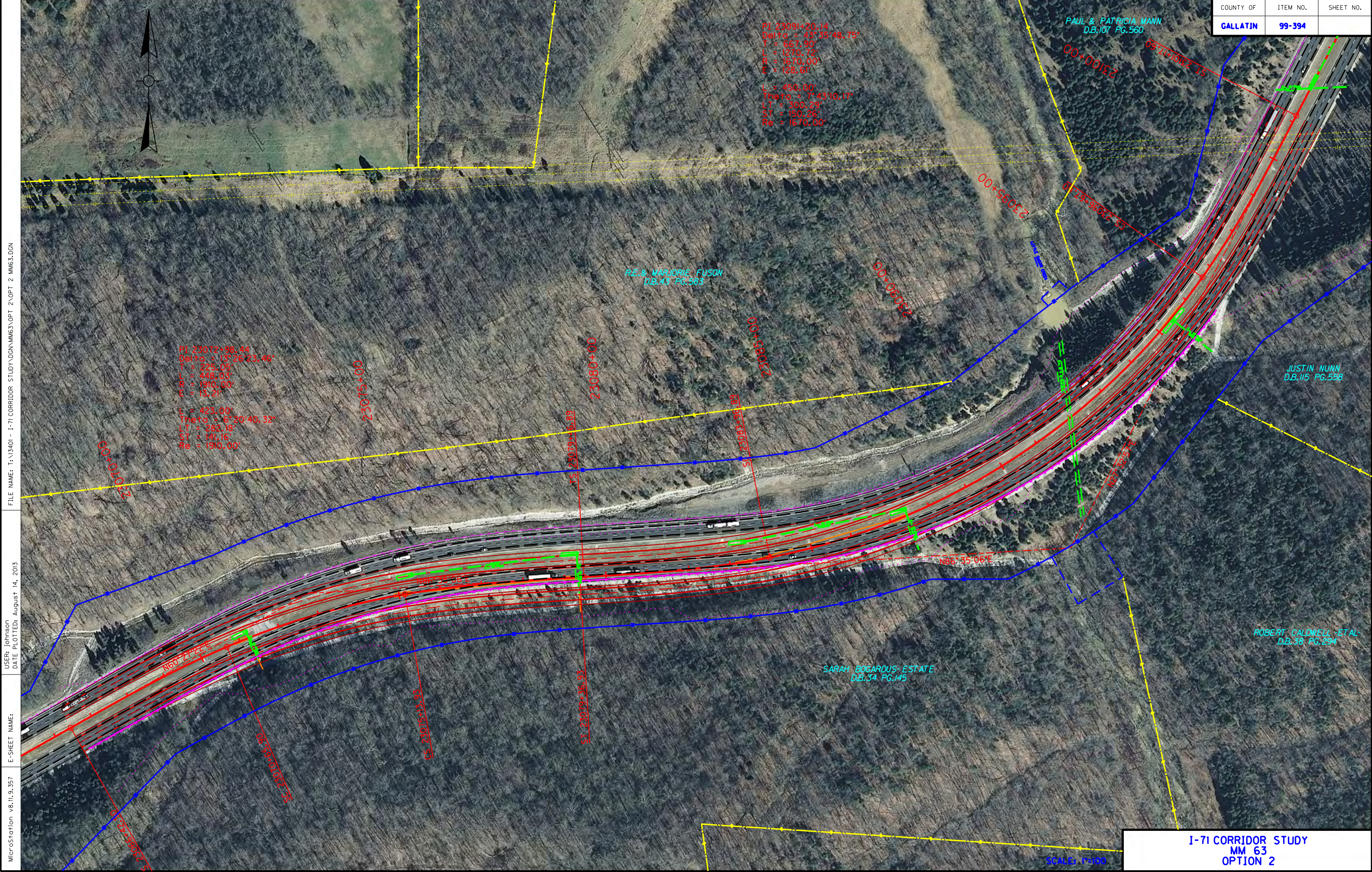
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MicroStation v8.11.9.357

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COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	



I-71 CORRIDOR STUDY
MM 63
OPTION 2

SCALE: N=100

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	

JUSTIN NUNN
D.B.115 PG.558



PAUL & PATRICIA MANN
D.B.107 PG.560

El 13091+73.29
 Delta = 43°18'19.65"
 l = 686.15"
 L = 1258.27"
 R = 1676.00"
 E = 127.39"
 l = 450.00"
 Theta = 7°40'57.68"
 LT = 300.28"
 ST = 150.25"
 Ro = 1678.00"

R.E. & MARJORIE FUSON
D.B.43 PG.583

ROBERT CALDWELL -ETAL-
D.B.38 PG.294

SARAH BOGARDUS- ESTATE
D.B.34 PG.145

I-71 CORRIDOR STUDY
MM 63
OPTION 1 WITH WALL

SCALE: 1"=100'

FILE NAME: T:\J3401 - I-71 CORRIDOR STUDY\DCN\MM63\OPT 1\OPT 1 MM63 WITH WALL.DGN

USER: johnson
DATE PLOTTED: August 14, 2013

E-SHEET NAME:

MicroStation v8.11.9.357

COUNTY OF	ITEM NO.	SHEET NO.
GALLATIN	99-394	

JUSTIN NUNN
D.B.115 PG.558



PAUL & PATRICIA MANN
D.B.107 PG.560

El 13091+73.29
 Delta = 43°18'19.65"
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 LT = 300.28"
 ST = 150.25"
 Ro = 1678.00"

R.E. & MARJORIE FUSON
D.B.43 PG.583

P1 13074+13.24
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 I = 28.41
 U = 558.90'
 R = 1909.86'
 E = 20.62'
 C = 300.00"
 Triang = 4'30'00.00"
 LT = 200.06'
 ST = 190.06'
 RB = 1909.86'

ROBERT CALDWELL -ETAL-
D.B.38 PG.294

SARAH BOGARDUS- ESTATE
D.B.34 PG.145

I-71 CORRIDOR STUDY
MM 63
OPTION 1

SCALE: 1"=100'

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USER: johnson
DATE PLOTTED: August 14, 2013

E-SHEET NAME:

MicroStation v8.11.9.357

2. **MP 38.9 to MP 39.1 in Carroll County, investigate what may be wrong at this location due to three fatalities in year 2012.**

Purpose and Need:

The purpose of this project is to improve safety. The initial evaluation of crashes in this area did not yield an area with any CCRF > 1.0. However, a quick check of the 2012 crashes revealed three fatalities in a 0.2 mile spot. Looking beyond this 0.2 mile spot, expanding 1.0 mile on either side, this area has multiple maximum 4% grades within back-to-back spiral curves, and two long narrow bridges at the end of a 3% downgrade heading northbound. The reverse is the case travelling southbound, there is a continuous uphill climb for approximately 2.5 miles beginning at approximately MP 38.3 to MP 40.8, with grades ranging from -0.5% to -4.0% and a possible deficient sag curve. The equivalent southbound grade was 3.62% for 2.33 miles. This length, according to the design manual and field observation, slows trucks by nearly 30 mph increasing the crash involvement rate by nearly five times. Many truck drivers use their flashers to warn other motorists of their slow speeds. This segment has a current year (2013) volume of 29,800 vpd and is estimated to carry 50,240 in 2038. When crashes are analyzed one mile on either side of this spot, the numbers of crashes seem to be on the rise beginning in 2012.

Total Crashes		
Year	MP 38.9 to 39.1	MP 37.9 to 40.1
2009	1	13
2010	2	12
2011	0	5
2012	3(see table below)	19
2013 (first 7 months)	2	9

There have been three fatal crashes in Carroll County MP 38.9 to MP 39.1 in 2012:

	NB to SB Crash on 1/28/2012	NB Crash on 7/15/2012	NB Crash on 11/5/2012
Time of Day	2:20 a.m.	6:35 p.m.	7:35 p.m.
Sun Issue	No	No	No
Bridge involvement	No	No	No
Basic summary	Driver lost control changing lanes on downgrade.	Driver swerved to avoid debris in road; lost control.	Failed to negotiate horizontal curve.
Other	Not wearing belt, but may have still been fatality if had been.	Drive under influence of prescription drugs.	Perhaps not fatal if wearing seatbelt.
	Wet weather	Dry weather	Dry weather

Improvement:

Add truck climbing lane in southbound direction.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$600,000
Right of Way	TBD	\$100,000
Utilities	TBD	\$200,000
Construction	TBD	\$7,000,000
Total		\$7,900,000

3. Add Capacity from I-265 to KY 329 in Jefferson/Oldham County (5.8 Miles)

Purpose and Need:

The purpose of this project is to improve congestion and safety on I-71. Currently I-71 from I-64 in downtown Louisville to KY 329 is operating at LOS F with v/c ratios exceeding 1.0 in the PM peak hour and truck percentages varying from 7% to 18%. There are also multiple areas where the Critical Crash Rate Factor exceeds 1.0 indicating that crashes at those locations exceed the crash rate for similar roadways in Kentucky.

Improvement:

Widen I-71 from four to six lanes and widen clear zone to current criteria.

Preliminary Cost Estimate:

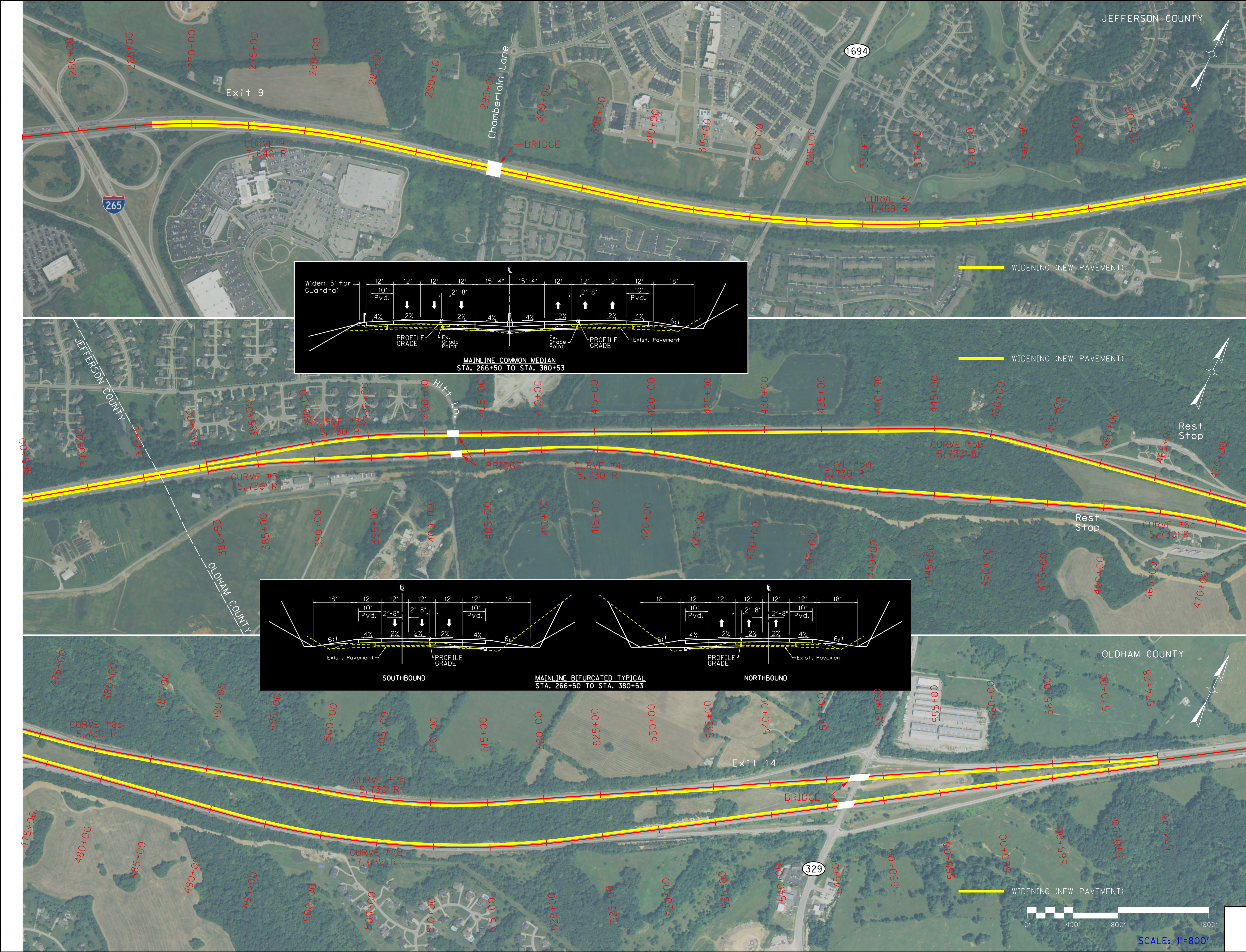
Phase	Year	Amount
Design	TBD	\$3,500,000
Right of Way	TBD	\$0
Utilities	TBD	\$700,000
Construction	TBD	\$50,000,000
Total		\$54,200,000

COUNTY OF	ITEM NO.	SHEET NO.
JEFFERSON/ OLDHAM	99-394.00	

I-71 from I-265 to KY 329 (Exit 9 to Exit 14):
5.8 miles from MP 9.2 to MP 14.99
(Sta. 266+50 to Sta. 574+28)

- Improvements include the following:
- Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier (12 ft. inside shoulders for Bifurcated sections) and 6 - 12 ft. lanes with 12 ft. shoulders.
 - 6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.
 - Replacing 5 Bridge structures above Chamberlain Lane (1), N. Hitt Lane (2), KY 329 (2).
 - Cross slope correction for 70 mph design speed per 2011 AASHTO Geometric Design Policy. 6 curves have deficient cross slopes (1, 3a/b, 4, 5 a/b, 6 a/b, 7 a/b).

TOTAL COST: \$46,086,000



I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM I-265 TO KY 329

4. KY 14 to I-75 Capacity Addition in Boone County (4.1 miles)

Purpose and Need:

The purpose of this project is to improve safety and congestion. A safety analysis based on crash data for the years 2009 – 2011 indicated a potential concern in the vicinity of the KY 14 interchange between MP 71.6 and MP 72.6. Five separate 0.1 mile spots within this one mile section had CCRFs ranging from 0.96 to 2.58. A review of crash reports were dominated by crashes that reflected conditions before or during roadway reconstruction. Kentucky State Police data between MP 71.6 and MP 72.6 was then searched with the following results:

Year	2009	2010	2011	2012	2013*
Number of Crashes	12	15	17	9	7

*Through July 31, 2013

The number of crashes occurring after construction appears to have declined relative to those that occurred prior to or during construction. Thus, there appears to be no safety component of the Purpose and Need of this proposed improvement.

Capacity analyses of current conditions indicated acceptable operation conditions:

2013	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	B	B	C	C
FFS	74.6			
Capacity (vphpl)	2446			
Flow Rate (pc/h/ln)	1092	1153	1459	1413
V/C	0.45	0.47	0.60	0.58

Design year capacity analyses indicate that 2038 volumes will result in LOS D, both northbound and southbound, in the pm peak period with volume-to-capacity ratios exceeding 0.8.

2038	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	C	C	D	D
FFS	74.6			
Capacity (vphpl)	2446			
Flow Rate (pc/h/ln)	1596 pc/h/ln	1681	2127	2063
V/C	0.65	0.69	0.87	0.84

Improvement:

To improve congestion it is recommended that this section of I-71 be widened from four to six lanes.

Preliminary Cost Estimate:

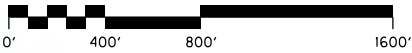
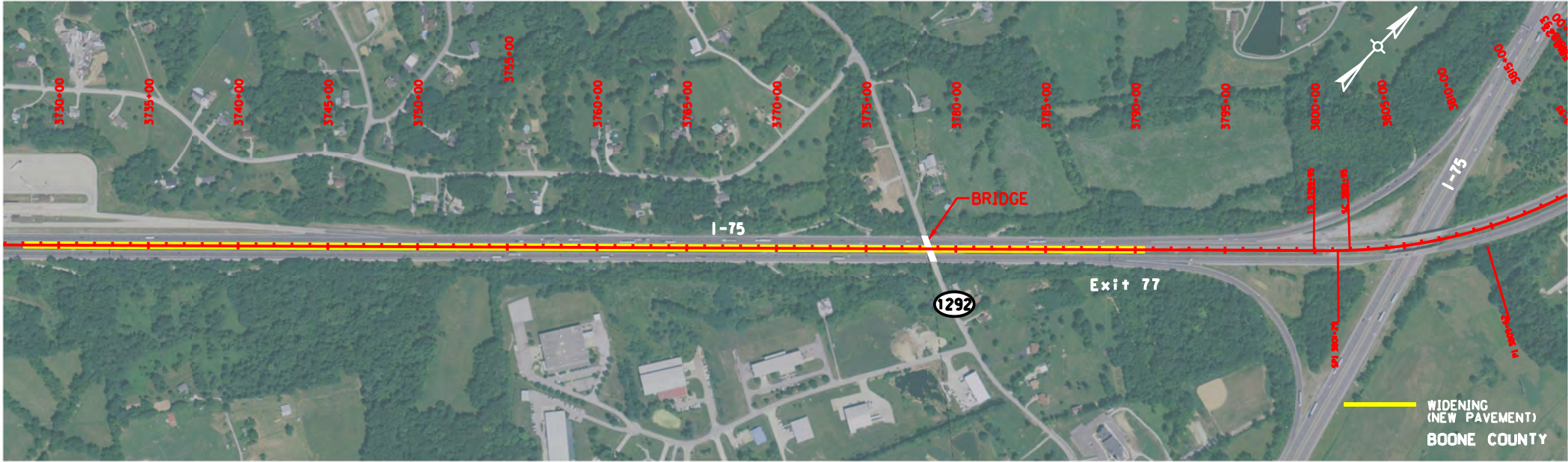
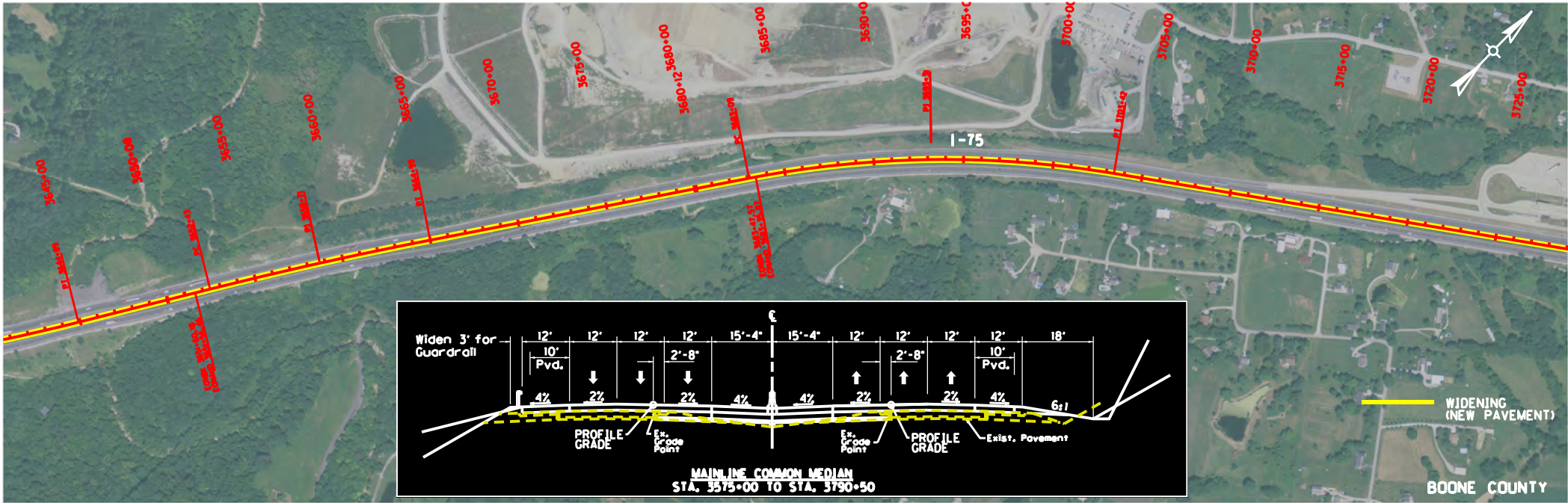
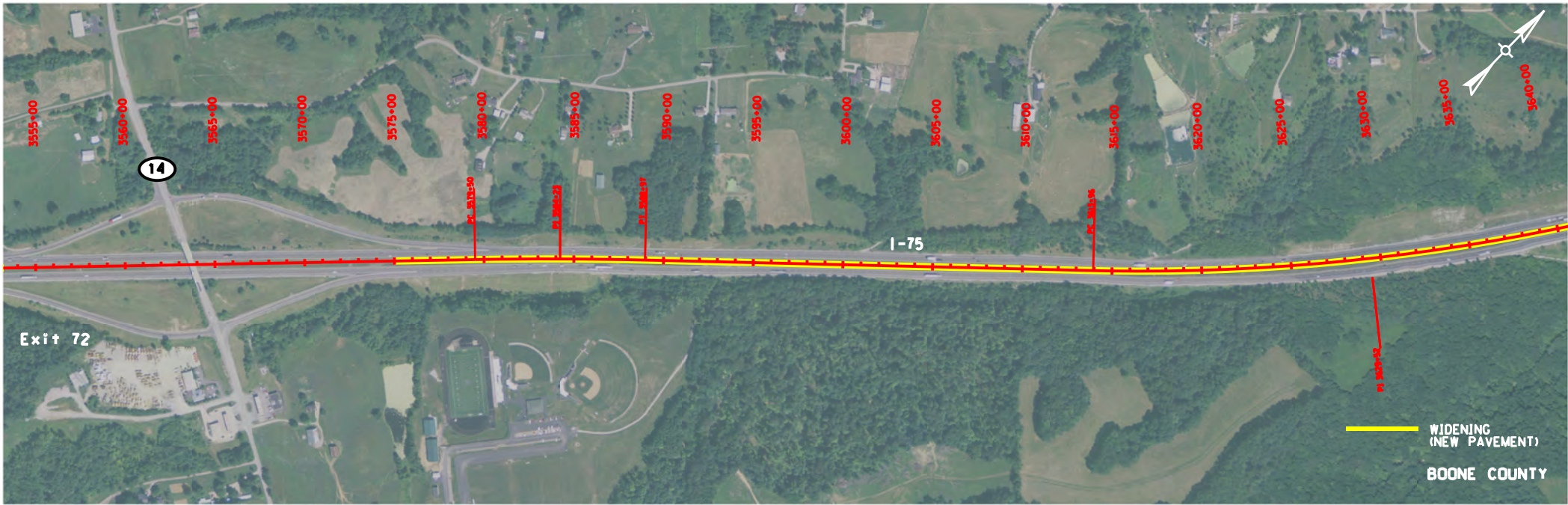
Phase	Year	Amount
Design	TBD	\$2,000,000
Right of Way	TBD	\$0
Utilities	TBD	\$400,000
Construction	TBD	\$30,000,000
Total		\$32,400,000

COUNTY OF	ITEM NO.	SHEET NO.
BOONE	99-394.00	

I-71 from KY 14 to I-75 (Exit 72 to Exit 77):
4.1 miles from MP 72.3 to MP 76.4
(Sta. 3575+00 to Sta. 3790+50)

- Improvements include the following:
- Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier and 6 - 12 ft. lanes with 12 ft. shoulders.
 - 6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.
 - Replacing 1 Bridge structure at Beaver Road, (KY 1292)

TOTAL COST: \$32,400,000



SCALE: 1"=800'

**I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM KY 14 TO I-75**

5. Truck Climbing Lane for KY 227 North (1.2 miles)

Purpose and Need:

The purpose of this project is to improve safety. A 4,850 foot-long grade northbound begins just east of the KY 227 interchange. A 2° horizontal curve characterizes the segment nearest the KY 227 interchange. In 2012 there were 33.2% trucks. More than 9,700 trucks currently utilize this roadway segment with that number expected to grow. “Trucks passing trucks” construct the free flow speed in the fast lane. This length, according to the design manual and field observation, slows trucks by over 25 mph increasing the crash involvement rate by nearly five times. Many truck drivers use their flashers to warn other motorists of their slow speeds. Also, the length of the current acceleration ramp from KY 227 to northbound I-71 is 124’ short of the desired length under current design standards.

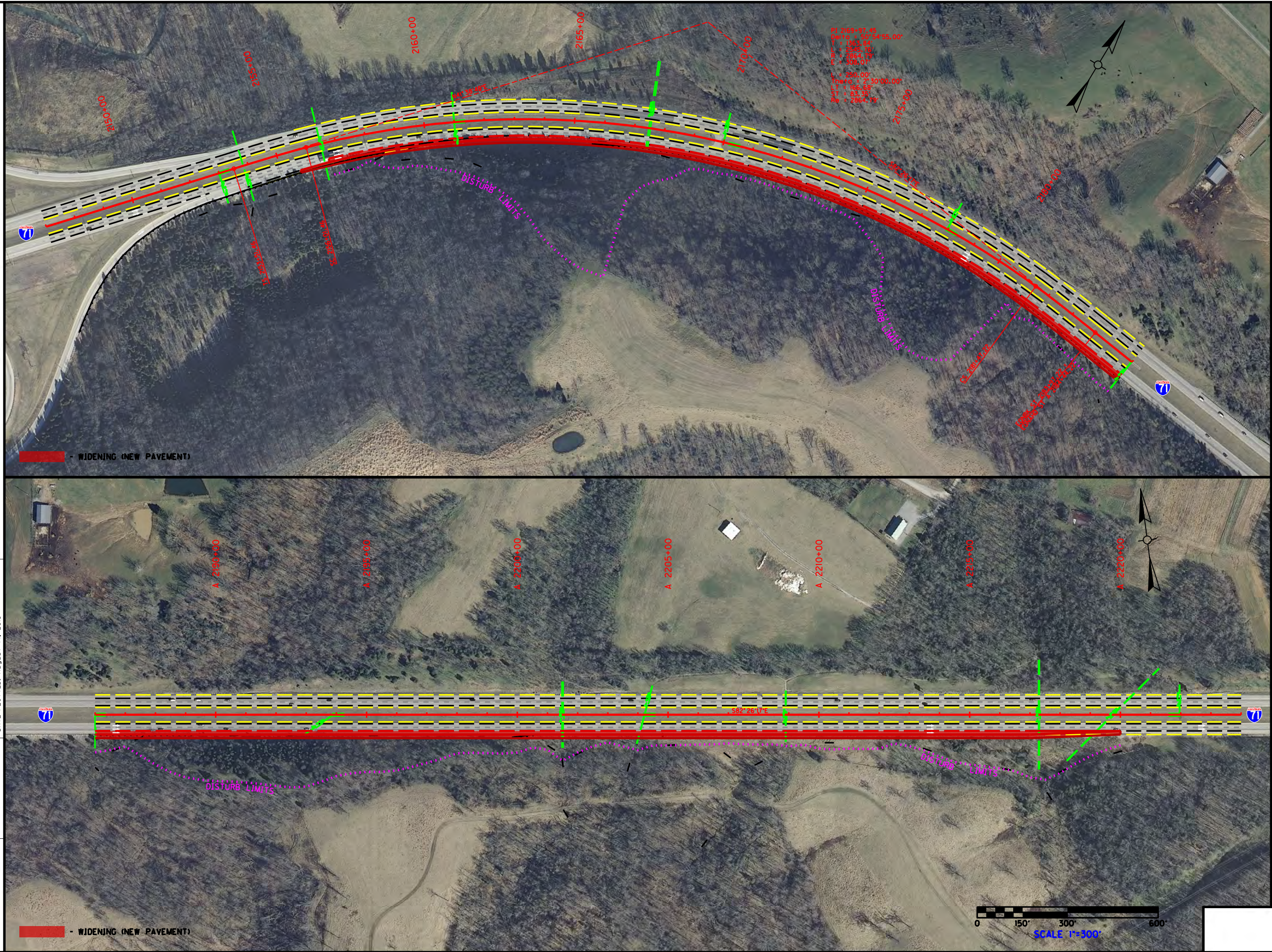
Improvement:

It is recommended that a truck climbing lane begin at the merge point for the northbound entrance ramp (approximately MP 44.8) and continue until tapering back in near MP 46.1.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$400,000
Right of Way	TBD	\$0
Utilities	TBD	\$100,000
Construction	TBD	\$5,000,000
Total		\$5,500,000

FILE NAME: I:\3401 - I-71 CORRIDOR STUDY\DGN\MM 44\MM44 TCL.DGN
USER: Johnson
DATE PLOTTED: August 14, 2013
E-SHEET NAME:
MicroStation v8.11.9.357



COUNTY OF	ITEM NO.	SHEET NO.
CARROLL	99-394	

I-71 CORRIDOR STUDY
MM 44 NORTHBOUND
TRUCK CLIMBING LANE

6. KY 329 – KY 146 in Oldham County (2.5 miles)

Purpose and Need:

The purpose of this project is to improve congestion. Crashes do not appear to be a problem in the section; the CCRF is only 0.43. No 0.1-mile spot in this section has a CCRF exceeding, or even approaching, 1.0. (The highest CCRF is 0.69 between MP 16.96 and MP 17.06). However, this section is already congested, especially in the afternoon peak period. The following metrics characterize the current conditions in the section between KY 329 and KY 146:

2013	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	C	C	F	D
FFS	73.0			
Capacity (vphpl)	2430			
Flow Rate (pc/h/ln)	1637	1722	2731	2103
V/C	0.67	0.71	1.12	0.87

Capacity analyses indicate that 2038 volumes will result in lower Levels of Service (LOS) (except northbound in the afternoon peak period which is already operating at LOS F and would continue to do so) and higher V/C ratios. The following metrics characterize the Year 2038 conditions in the section between KY 329 and KY 146:

2038	AM Northbound	AM Southbound	PM Northbound	PM Southbound
LOS	D	E	F	F
FFS	73.0			
Capacity (vphpl)	2430			
Flow Rate (pc/h/ln)	2103	2215	3493	2695
V/C	0.87	0.91	1.44	1.11

Improvement:

To improve congestion it is recommended that this section I-71 be widened from four to six lanes. A continuous additional lane will be carried between exits 17 and 18 to address weaving issues.

Preliminary Cost Estimate:

Phase	Year	Amount
Design	TBD	\$1,500,000
Right of Way	TBD	\$0
Utilities	TBD	\$300,000
Construction	TBD	\$20,000,000
Total		\$21,800,000

COUNTY OF	ITEM NO.	SHEET NO.
OLDHAM	99-394.00	

I-71 from KY 329 to KY 146 (Exit 14 to Exit 17):
2.5 miles from MP 14.99 to MP 17.53
(Sta. 574+88 to Sta. 708+09)

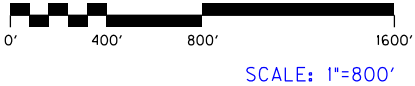
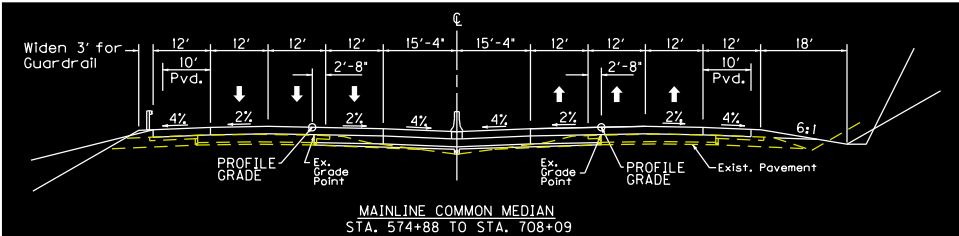
Improvements include the following:

Adding a lane in each direction. Six-Lane typical sections include 30 ft.-8in median with barrier and 6 - 12 ft. lanes with 12 ft. shoulders.

6:1 foreslopes with 30' clear zone. This would not affect the existing right-of way.

Replacing 3 Bridge overpass structures at Glenarm Road (1), KY 146 (1), and the CSX Railroad (1).

TOTAL COST: \$21,652,000



I-71 CORRIDOR STUDY
IMPROVEMENT ALTERNATE
I-71 FROM KY 329 TO KY 146

Minor Improvement Options (Quick wins)

At present, there are a few quick wins that could also be considered. Additional quick wins will be available in October.

1. Cable Guardrail:

A review of crossover crashes, existing cable guardrail locations, relevant location to the above crash concerns, and consultation with KYTC, the following locations are recommended for cable guardrail:

HEAD ON Crashes 2009-2011					
	MP	KYTC Plans or Conditions	NB	SB	Crash type
Oldham	11.905	bifurcated		x	Collision with fixed object
Oldham	12.605	bifurcated	x		Head on; dark not lighted
Oldham	13.384	bifurcated	x		Head on; wet
Oldham	14.924	bifurcated		x	Collision with fixed object
Oldham	16.991	2013 letting		x	Vehicle going wrong direction
Oldham	17.209	2013 letting		x	Head on
Henry	25.963	None		x	Occ fell from moving vehicle
Henry	27.15	None	x		Head on
Henry	29.797	None		x	Occupant fell from moving vehicle
Carroll	39.603	None	x		Occupant fell from moving vehicle
Carroll	40.497	None	x		Occupant fell from moving vehicle curve and grade
Carroll	50.375	None		x	Occupant fell from moving vehicle
Carroll	50.54	None		x	Vehicle going wrong direction
Gallatin	57.348	None		x	Collision with nonfixed object
Gallatin	62.92	Existing cable		x	Vehicle leaving or entering parked position
Gallatin	63.197	Existing cable		x	Collision with fixed object? Raining
Boone	69.899	On list to do whole county not funded	x		Head on; raining
Boone	70.381	On list to do whole county not funded		x	Dark, head on, dry and clear
Boone	70.584	On list to do whole county not funded	x		Dark, not lighted, clear and dry
Boone	72.538	On list to do whole county not funded	x		Head on; raining
Boone	75.669	On list to do whole county not funded	x		Straight and level; dry and clear

Recommendations	Beg MP	End MP	Priority	Cost \$150,000/MI
Boone County	70	78	1	\$1,200,000
Carroll County	43.9	46.9	2	\$450,000
Oldham County	22.536	23.427	3	\$133,650
Henry County	25.769	27.383	4	\$242,100
Henry County	30.97	33.052	5	\$312,300

2. Signal on KY 146 on North Side of I-71 Interchange:

The purpose of this quick win is to improve congestion at the KY 146/I-71 Interchange ramp terminals. The NB ramps on the south side of the KY 146/I-71 interchange are controlled by a traffic signal. The southbound ramps on the north side the KY146/ I-71 interchange are not controlled by a traffic signal, but warrants for a signal are met at that location. Crashes do not appear to be a problem.

Without Signal			With Signal	
KY 146 @ SB Ramps	Approach Delay (secs)	LOS Without Signal	Approach Delay (secs)	LOS With Signal
AM Peak Period	538	F	22	C
PM Peak Period	165	F	26	C

As shown above, signalizing that location (and coordinating that signal with the one currently on the south side of the interchange) appears to improve congestion levels. The estimated cost of installing this signal and interconnecting it with the one currently on the south side of the KY 146/I-71 interchange is \$150,000.

3. Signal on KY 329 on North Side of I-71 Interchange and Crossroad Left Turn Lane

Currently, the I-71/KY 329 ramp terminals for turns from I-71 to KY 329 operate at LOS E and F in the peak hours. There are no left turn lanes under the bridge, and there are steep downgrades in both directions toward the ramp terminals. The hourly volumes for the left turns from I-71 at the NB ramp terminal are only 70/80 vpd in the AM/PM peak hours.

Although both ramp terminals meet signal warrants, it is recommended that only one signal be installed at the SB ramps. However, to operate at an acceptable LOS, due to the KY 329 lefts onto NB I-71, a left turn lane is needed at that location. The cost estimate for this improvement is \$1,000,000.

4. Additional Signage (MP 38 to 39)

Because of the recent accident history, the exhibit on the following page shows where additional signs could be added to improve safety.

- Both sides of road – add slick pavement signs
- NB down grade is 4% and there is a 2.5 degree curve – add curve warning sign and a downgrade sign for trucks.

The approximate cost for this improvement is \$10,000.

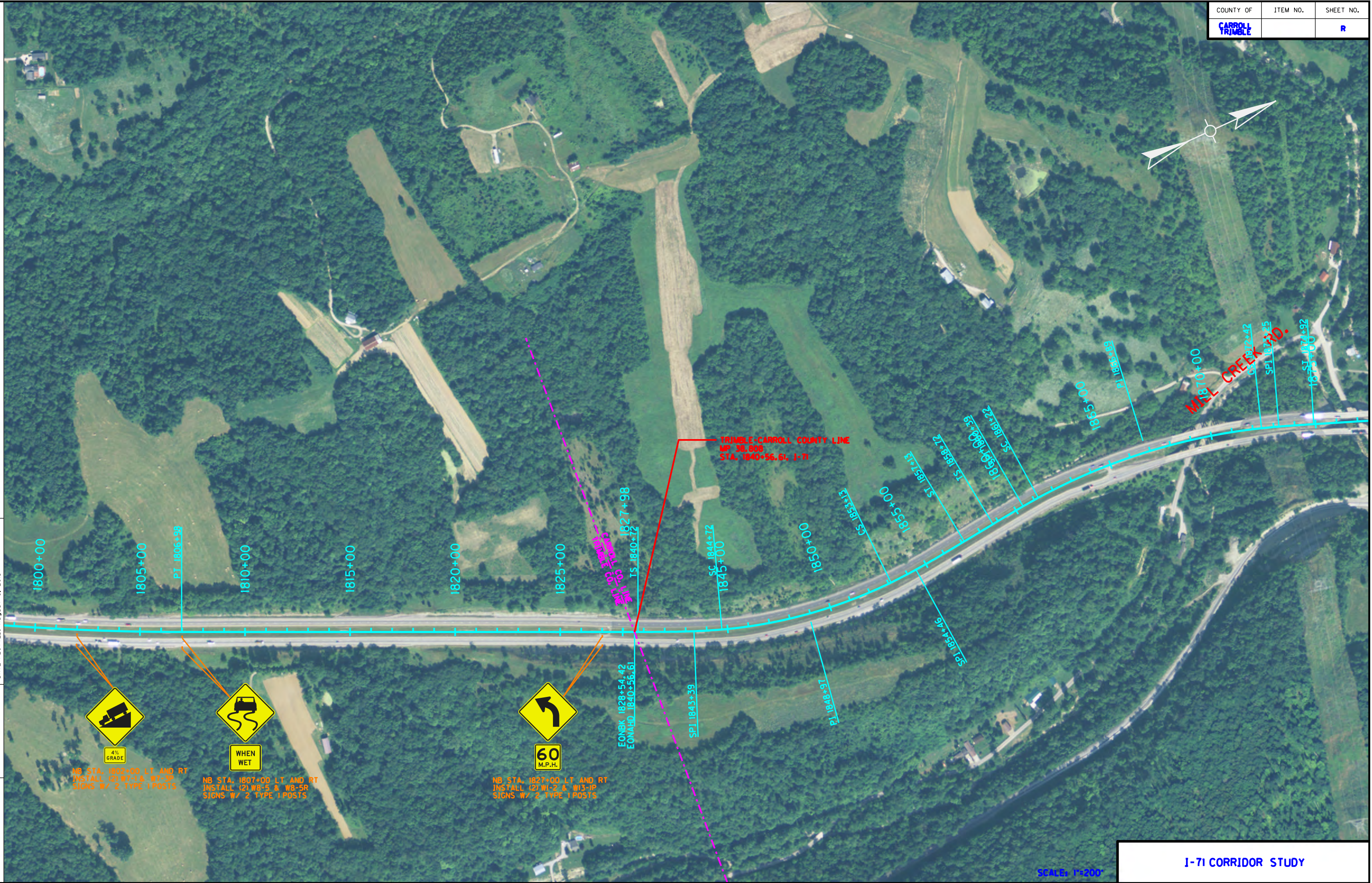
COUNTY OF	ITEM NO.	SHEET NO.
CARROLL TRIMBLE		R



USER: cpadgett
DATE PLOTTED: August 9, 2013

E-SHEET NAME:

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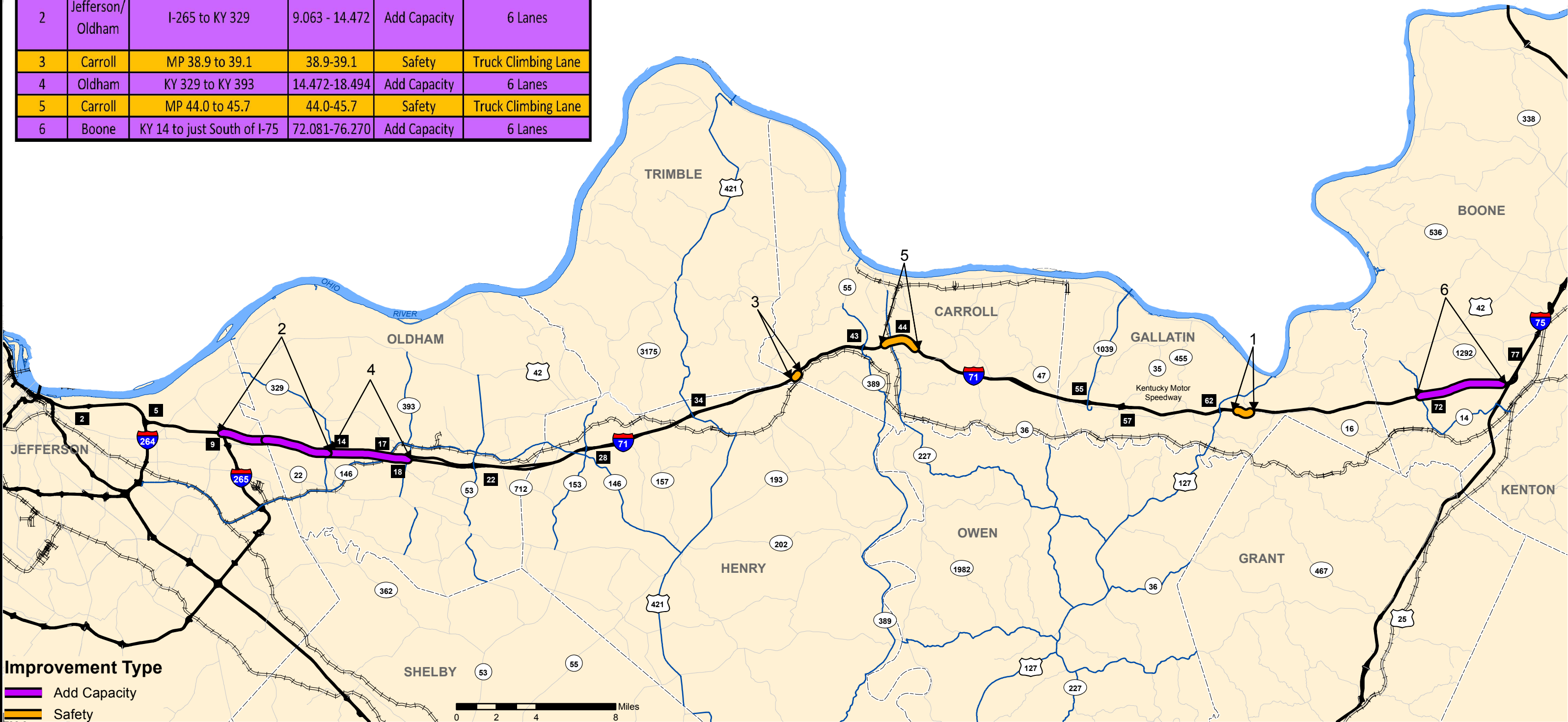
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I-71 CORRIDOR STUDY

Jefferson, Oldham, Henry, Trimble,
Carroll, Gallatin, and Boone Counties
Milepoint 0.000 to 77.724

Improvement Type

	Add Capacity
	Safety






Minor Improvement Options (Quick Wins)

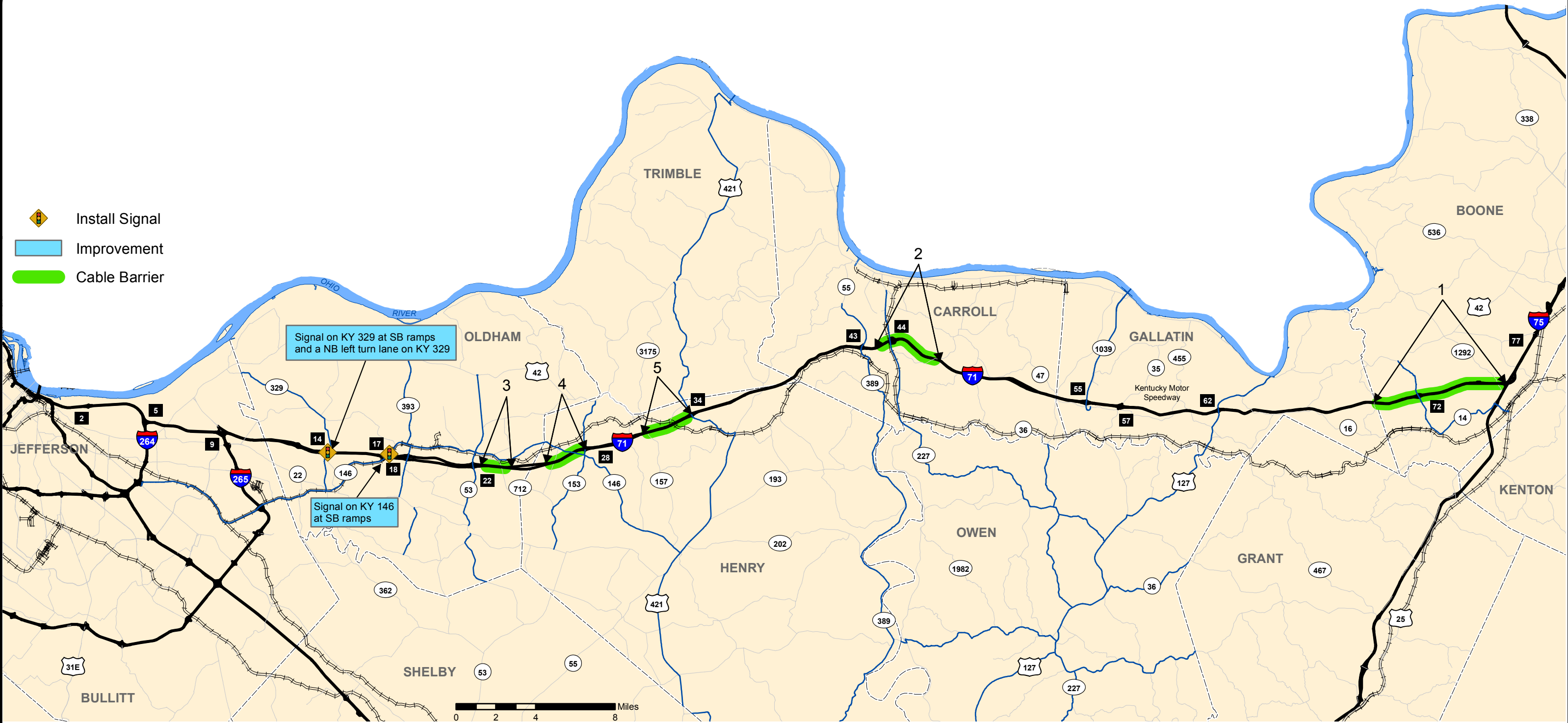
I-71

Jefferson, Oldham, Henry, Trimble,
Carroll, Gallatin, and Boone Counties

Milepoint 0.000 to 77.724



-  Install Signal
-  Improvement
-  Cable Barrier



0 2 4 8 Miles