

# Proposed Diverging Diamond Interchange

**Mike Gramza, PE, ODOT D2**

District Planning and Engineering Administrator

**Rick McGuckin, PE, DGL Consulting Engineers, LLC**

Director of Transportation

# Agenda

- Diverging Diamond Interchange (DDI)
- DDI Benefits
- Public Participation
- Existing Conditions
- Key Design Concepts
- Schedule



# SR 25 over I-475 Perrysburg, Ohio



Cost: \$7.99M  
Award: 8/18/16  
Contractor: ES Wagner

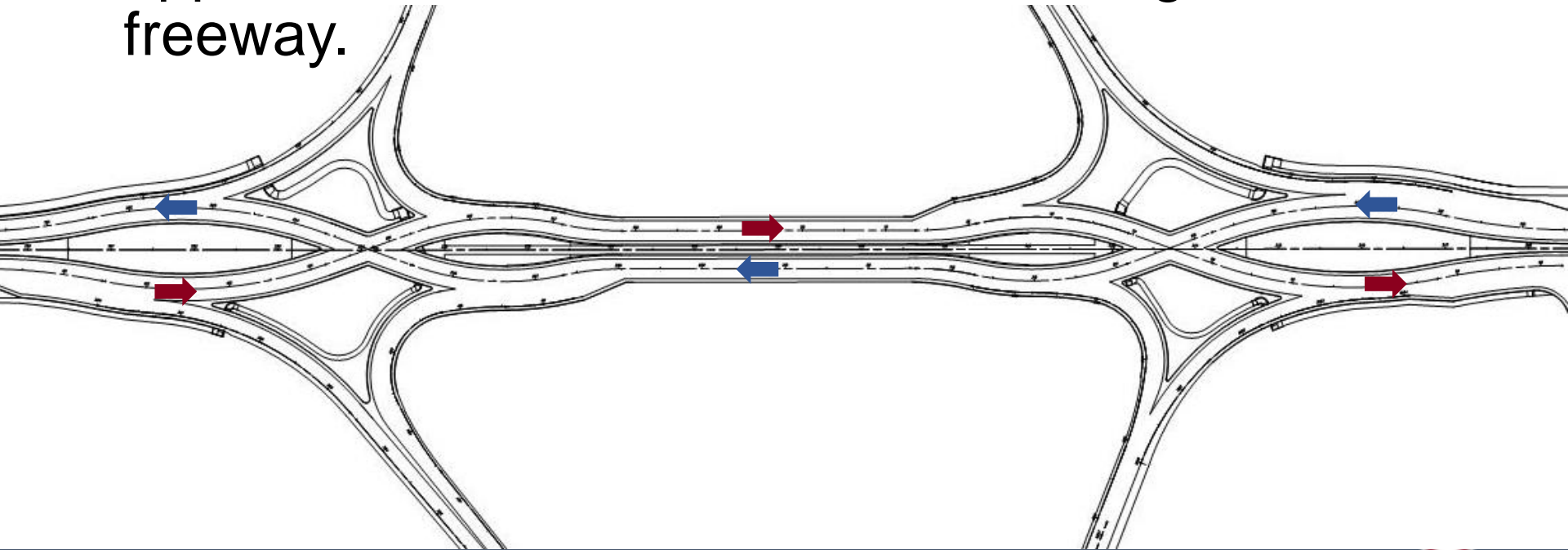


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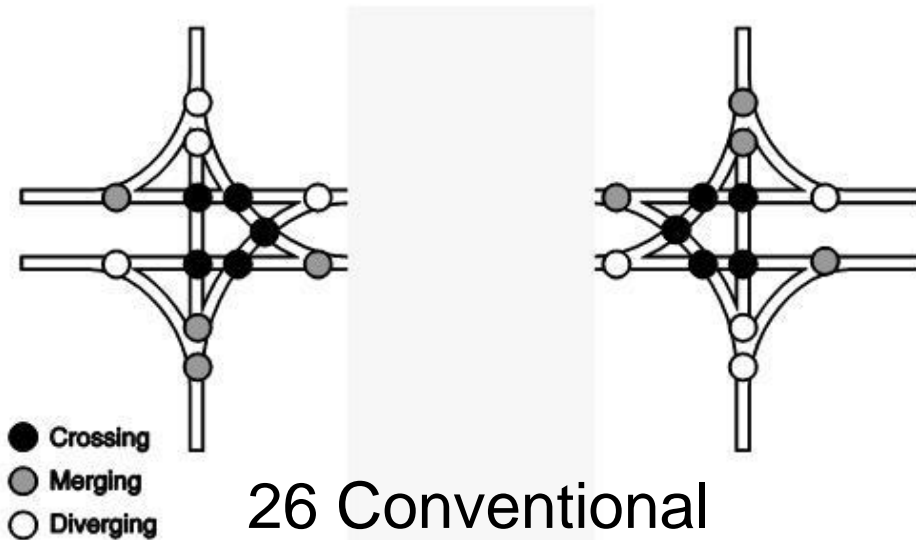
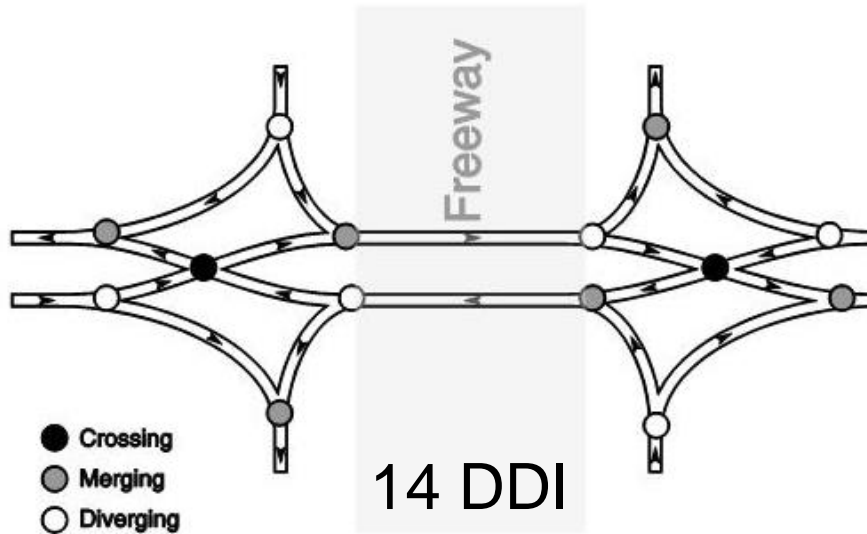
# DDI definition

Diverging Diamond Interchange: a type of diamond interchange in which two directions of traffic on the non-freeway road cross to the opposite side on both sides of the bridge at the freeway.



# DDI Benefits

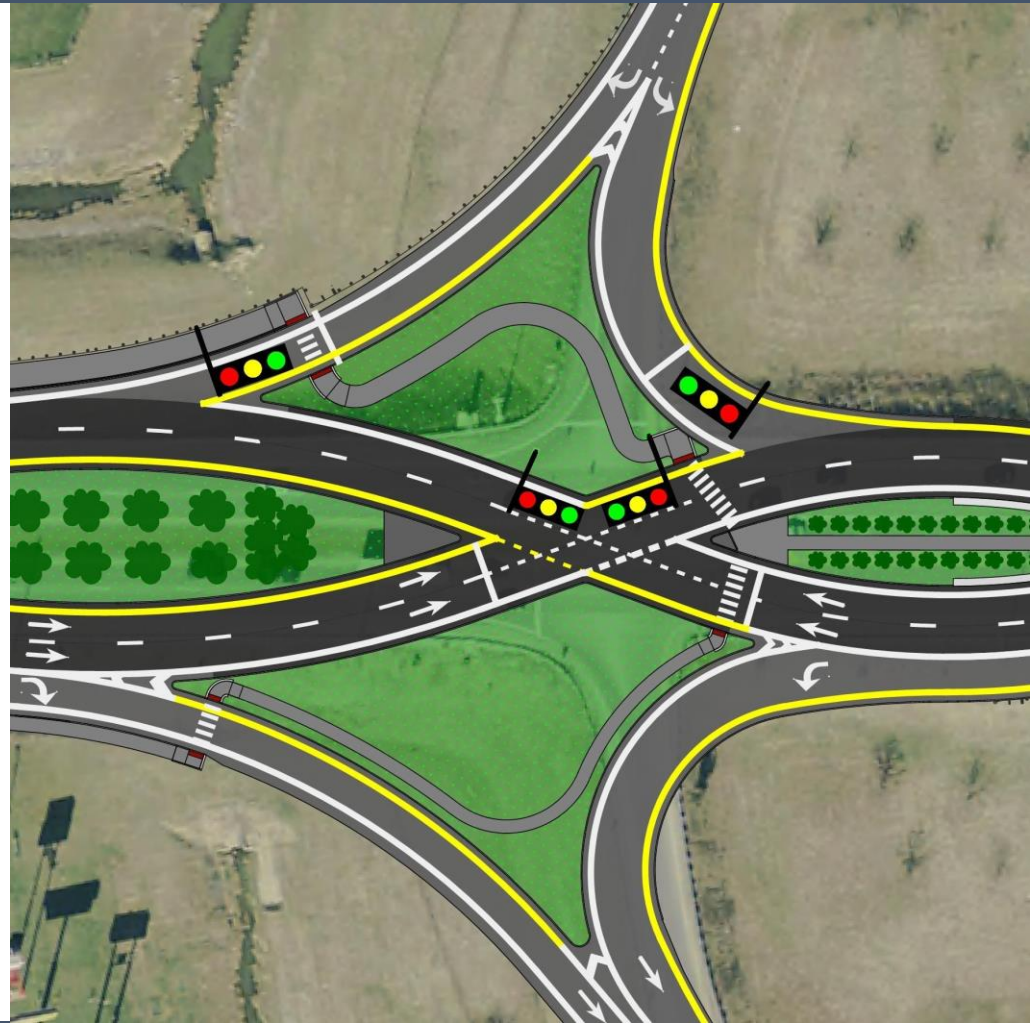
Safety ~ Fewer conflict points



# DDI Benefits

## Safety

- Better sight distance at turns
- Wrong way entry to ramps extremely difficult
- Shorter pedestrian crossings



# DDI Benefits

## Operational

- Two-phase signals reduce lost time at interchange
- Increased capacity
- Better storage between ramp terminals
- Left and right turns onto freeway may be free-flowing
- Reduce queue spillback potential



# DDI Benefits

## Cost Savings

- Minimal structure work
- Decreased construction time





# SR 25 DDI History

- District Safety Review Team
- Funding
- City of Perrysburg Involvement

# Existing Conditions



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# Structure (77.5' f/f parapet)

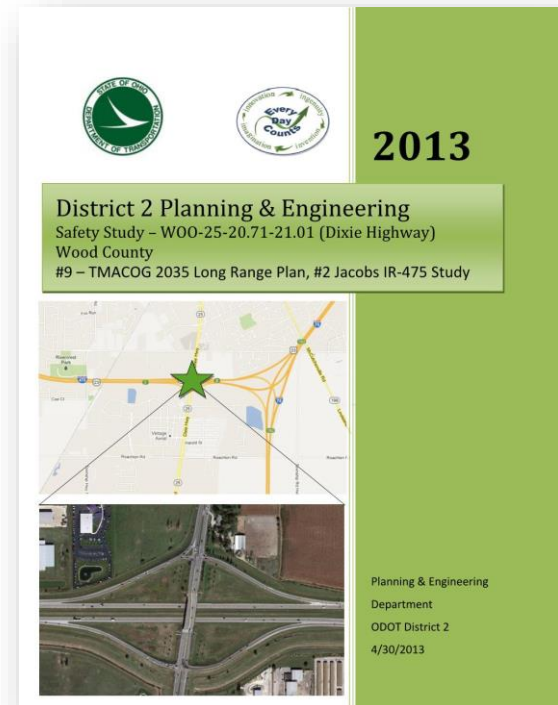


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# Traffic

- Traffic backups onto mainline IR-475
- Traffic queues observed to back out of turn lanes
- Crashes ~ 60 per year (expected 42)



# Interchange Options

- ODOT District 2 looking into interchange modification options late 2012
- Early planning level research they contacted Gilbert Chlewicki, PE (DDI)

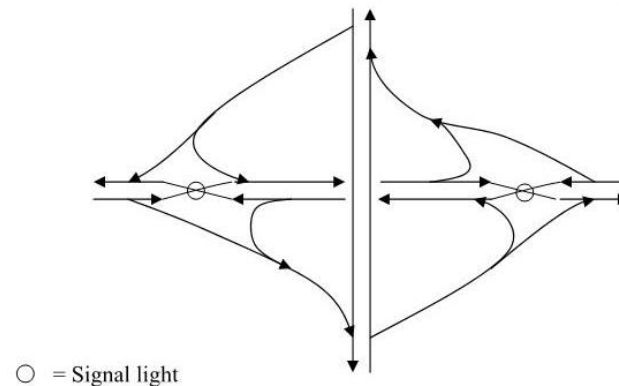
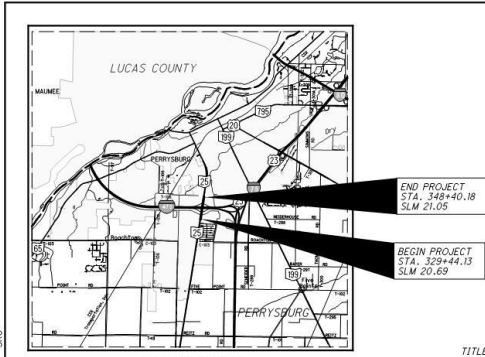


Figure 3. Diverging Diamond Interchange.

2<sup>nd</sup> Urban Street Symposium (Anaheim, California) — July 28-30, 2003

# SR 25 over I-475 Perrysburg, Ohio



**LOCATION MAP**  
 LATITUDE: 41°31'58" LONGITUDE: 83°38'10"  
 SCALE IN MILES

PORTION TO BE IMPROVED	_____
INTERSTATE HIGHWAY	_____
STATE & FEDERAL ROUTES	_____
COUNTY ROADS	_____
TOWNSHIP AND OTHER ROADS	_____

**DESIGN DESIGNATION** SR 25

CURRENT ADT (2015)	30770
DESIGN YEAR ADT (2033)	36525
DESIGN HOURLY VOLUME (2033)	3653
DIRECTIONAL DISTRIBUTION	50%
TRUCKS (24 HOUR B&C)	4%
DESIGN SPEED	VARIES (40-30 MPH)
LEGAL SPEED	40 MPH
DESIGN FUNCTIONAL CLASSIFICATION	MINOR ARTERIAL (URBAN)
NHS PROJECT	NO

**DESIGN EXCEPTIONS** **APPROVAL DATES** **SHEET NUMBERS**

HORIZONTAL ALIGNMENT (RAMPS A E-N, B S-E, C W-S & D N-W)	6/15/2015	2-3
SUPERELEVATION RATES (RAMPS A E-N, B S-E, C W-S & D N-W)	6/16/2015	237-244

**UNDERGROUND UTILITIES**  
 CONTACT BOTH SERVICES TWO WORKING DAYS BEFORE YOU DIG.

**OHIO Utilities Protection SERVICE**  
 (Non-members must be called directly)  
 OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE  
**1-800-929-0988**  
 PLAN PREPARED BY:  
 DGL CONSULTING ENGINEERS  
 3455 BRIARFIELD BLVD - STE E  
 MAUMEE, OH 43537  
 419-535-1015

TITLE SHEET	1	CROSS SECTIONS - RAMP B N-E	163-180
SCHEMATIC PLAN	2-3	CROSS SECTIONS - RAMP B S-E	181-190
GENERAL NOTES	4-23	CROSS SECTIONS - RAMP C	191-198
MAINTENANCE OF TRAFFIC	24-26	CROSS SECTIONS - RAMP C W-S	199-205
GENERAL SUMMARY	27-69, 69A, 70-75	CROSS SECTIONS - RAMP C W-W	206-212
SUB SUMMARY	80-84	CROSS SECTIONS - RAMP D S-W	213-231
PROJECT SITE PLAN	85-86	CROSS SECTIONS - RAMP D N-W	232-241
PLAN AND PROFILE - SR 25	87-96	GRADING DETAILS	242-249
PLAN AND PROFILE - RAMP A E-S	97-99	JOINT DETAILS	250-271
PLAN AND PROFILE - RAMP A E-W	100	CONCRETE MEDIAN DETAIL	272-273
PLAN AND PROFILE - RAMP B N-E	101-102	CULVERT DETAIL	274
PLAN AND PROFILE - RAMP B S-E	103-104	UNDERDRAIN DETAIL	275
PLAN AND PROFILE - RAMP C	105	RETAINING WALL	276-278
PLAN AND PROFILE - RAMP C W-S	106	BIKE RAIL DETAIL	279
PLAN AND PROFILE - RAMP C W-W	107-108	TRAFFIC CONTROL	280-310
PLAN AND PROFILE - RAMP D S-W	109-111	LIGHTING	311-317
PLAN AND PROFILE - RAMP D N-W	112	STRUCTURE (OVER 20' SPAN)	
CROSS SECTIONS - SR 25	113-139	WOO-25-20.70	318-319
CROSS SECTIONS - RAMP A E-S	140-185	RIGHT OF WAY	320-345
CROSS SECTIONS - RAMP A E-W	156-162		

**STANDARD CONSTRUCTION DRAWINGS** **SUPPLEMENTAL SPECIFICATIONS**

BP-2.1	7/17/15	HL-10.11	1/15/16	MCS-1.1	7/19/13	MT-95.41	7/18/14	TC-7.65	1/15/16	800	4/15/16
BP-2.2	7/18/08	HL-10.12	1/15/16	MCS-2.1	7/19/13	MT-98.29	7/19/13	TC-21.10	1/15/16	832	1/17/14
BP-3.1	7/18/14	HL-10.13	1/15/16	MCS-3.1	7/18/14	MT-100.00	1/15/16	TC-22.20	1/17/14	840	7/17/14
BP-5.1	7/18/13	HL-20.11	1/16/15	MCS-3.2	1/18/13	MT-101.70	1/17/14	TC-41.30	10/18/13	875	1/17/14
BP-6.1	7/18/13	HL-20.14	1/16/15	MCS-4.2	7/18/13	MT-101.90	7/17/15	TC-41.50	10/18/13		
BP-7.1	7/18/14	HL-30.11	1/15/16			MT-102.10	7/18/14	TC-42.10	10/18/13		
		HL-30.21	1/17/14	MH-1.2	1/15/16	MT-102.20	7/18/14	TC-42.20	10/18/13		
CB-2.2	1/15/16	HL-30.22	1/17/14			MT-105.10	7/19/13	TC-51.11	1/15/16		
CB-2.3	1/15/16	HL-30.33	1/17/14	RM-3.1	7/19/13			TC-65.10	1/17/14		
DM-1.1	1/15/16	HL-30.41	7/18/14	RM-4.5	7/18/14	PCB-91	1/18/13	TC-65.11	7/18/14		
DM-1.2	1/18/13	HL-40.20	1/16/15					TC-71.10	1/17/14		
DM-4.3	1/15/16	HL-60.11	1/15/16					TC-72.20	7/18/14		
DM-4.4	1/15/16	HL-60.31	7/17/15			VPF-1-90	7/17/15	TC-81.21	1/15/16		
F-2.1	7/18/13			SBR-1-13	1/17/14			TC-83.10	1/15/16		
F-3.3	7/18/13	HW-2.2	1/15/16					TC-83.20	1/15/16		
F-3.4	7/18/13							TC-95.20	1/15/16		

**SPECIAL PROVISIONS**

WATERWAY PERMIT	8/18/15
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**ENGINEERS SEAL:**

**STATE OF OHIO**  
 RICHARD J. MCGOUGH  
 ENGINEER  
 PROFESSIONAL ENGINEERING BOARD

SIGNED: *[Signature]*  
 DATE: 4/29/2016

STATE OF OHIO  
 DEPARTMENT OF TRANSPORTATION  
**WOO-25-20.70**  
**PART 1**  
 CITY OF PERRYSBURG  
 WOOD COUNTY

**INDEX OF SHEETS**

**PROJECT DESCRIPTION**  
 IMPROVEMENT OF 0.44 MILES OF STATE ROUTE 25 BY WIDENING ROADWAY TO CONSTRUCT A DIVERGING DIAMOND INTERCHANGE. WORK ALSO INCLUDES LIGHTING AND AND TRAFFIC CONTROL (PAVEMENT MARKING, SIGNING AND SIGNALS).

PROJECT EARTH DISTURBED AREA = 18.9 ACRES  
 ESTIMATED CONTRACTOR EARTH DISTURBED AREA = 3.25 ACRES  
 NOTICE OF INTENT EARTH DISTURBED AREA = 22.15 ACRES

**LIMITED ACCESS**  
 THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

**2013 SPECIFICATIONS**  
 THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVED THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY EXCEPT AS NOTED ON SHEET 26, AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED \_\_\_\_\_  
 DATE \_\_\_\_\_ DISTRICT DEPUTY DIRECTOR

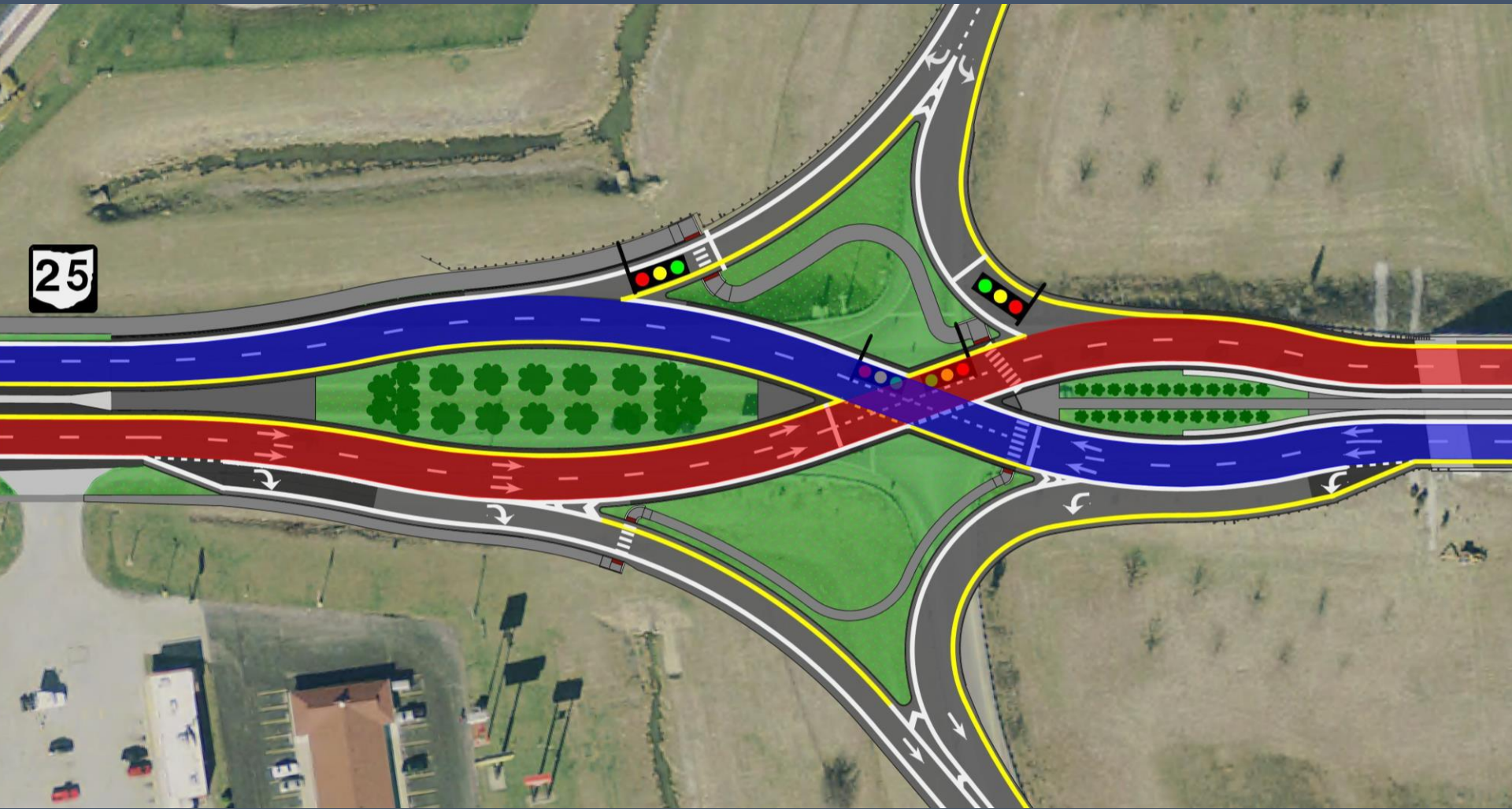
APPROVED \_\_\_\_\_  
 DATE \_\_\_\_\_ DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO.	E150 (188)
FID NO.	96249
CONSTRUCTION PROJECT NO.	
RELAYED INVOLVEMENT	NONE
WOO-25-20.70	
1	345

# DDI & Key Design Concepts



# Through Movements at Crossover

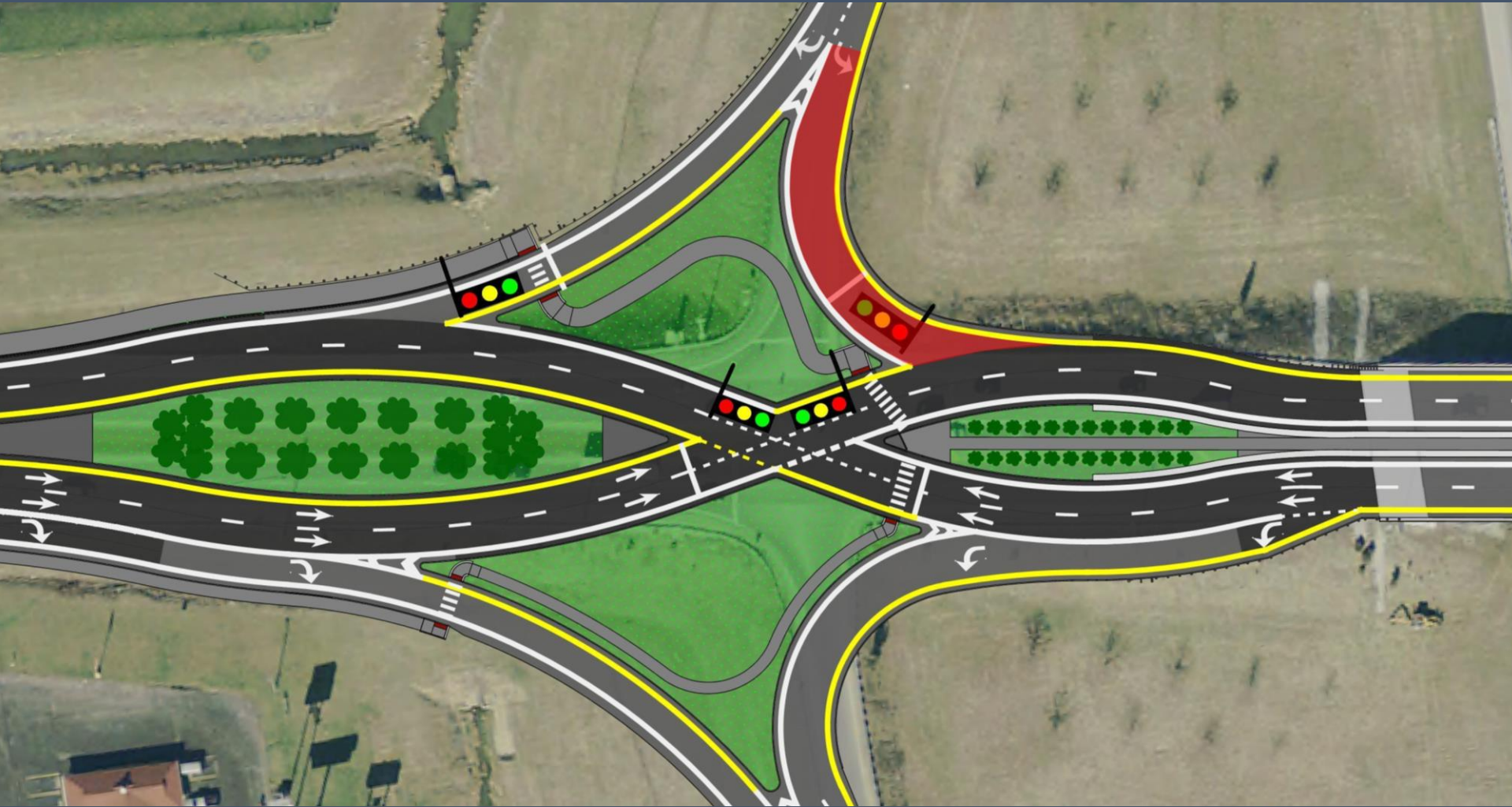


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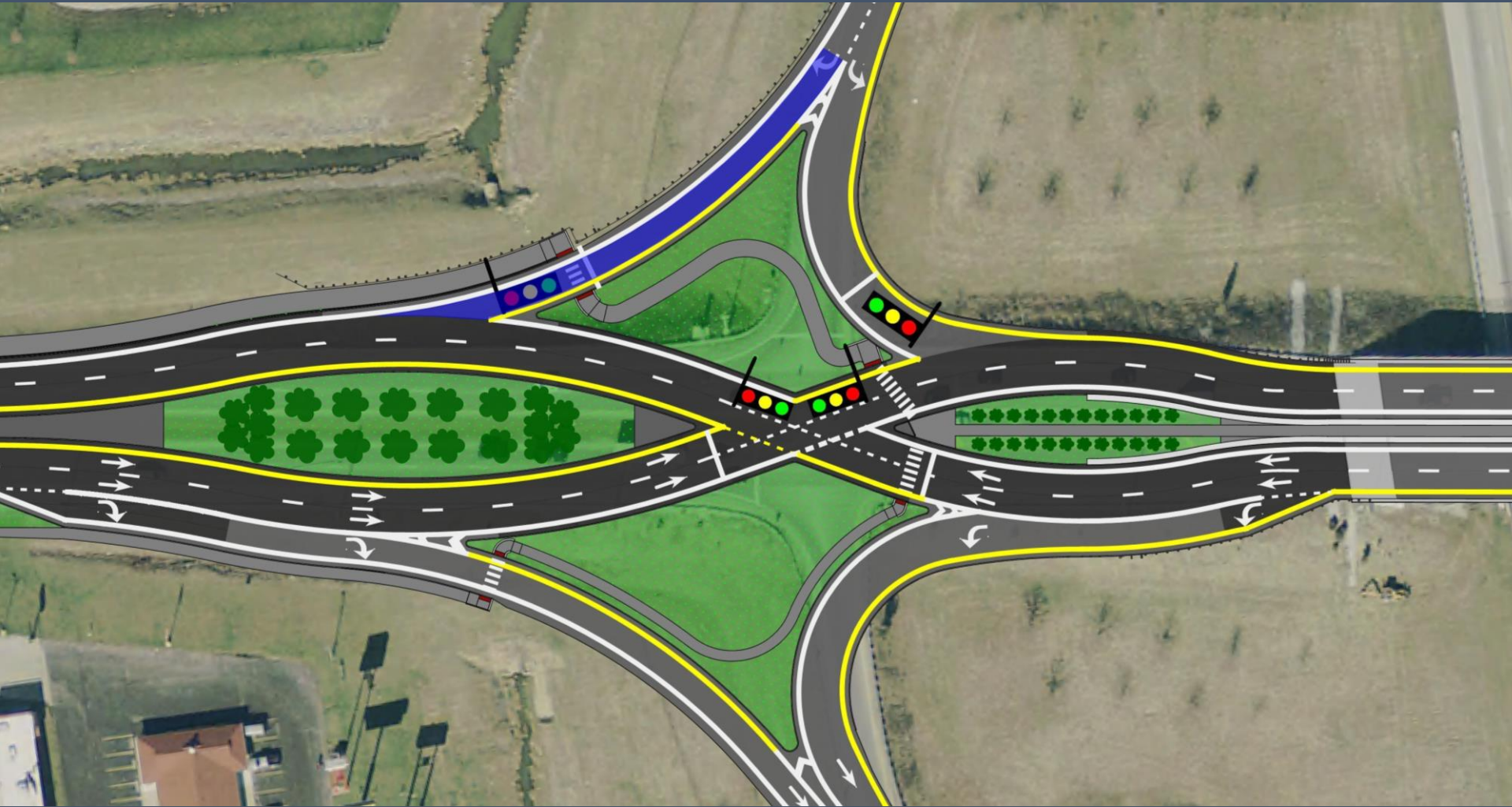




# Left Turns at Exit Ramp



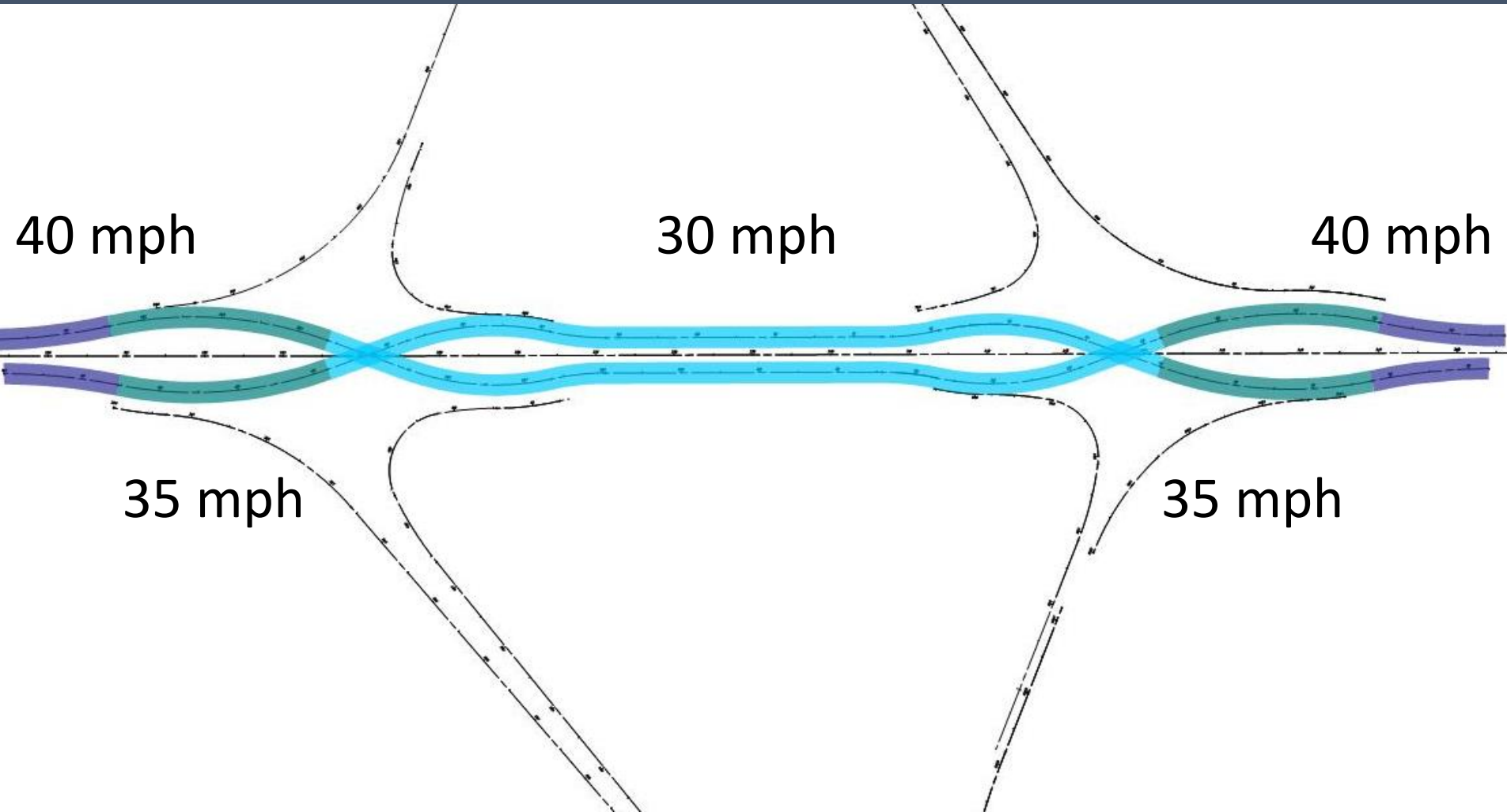
# Right Turns at Exit Ramp



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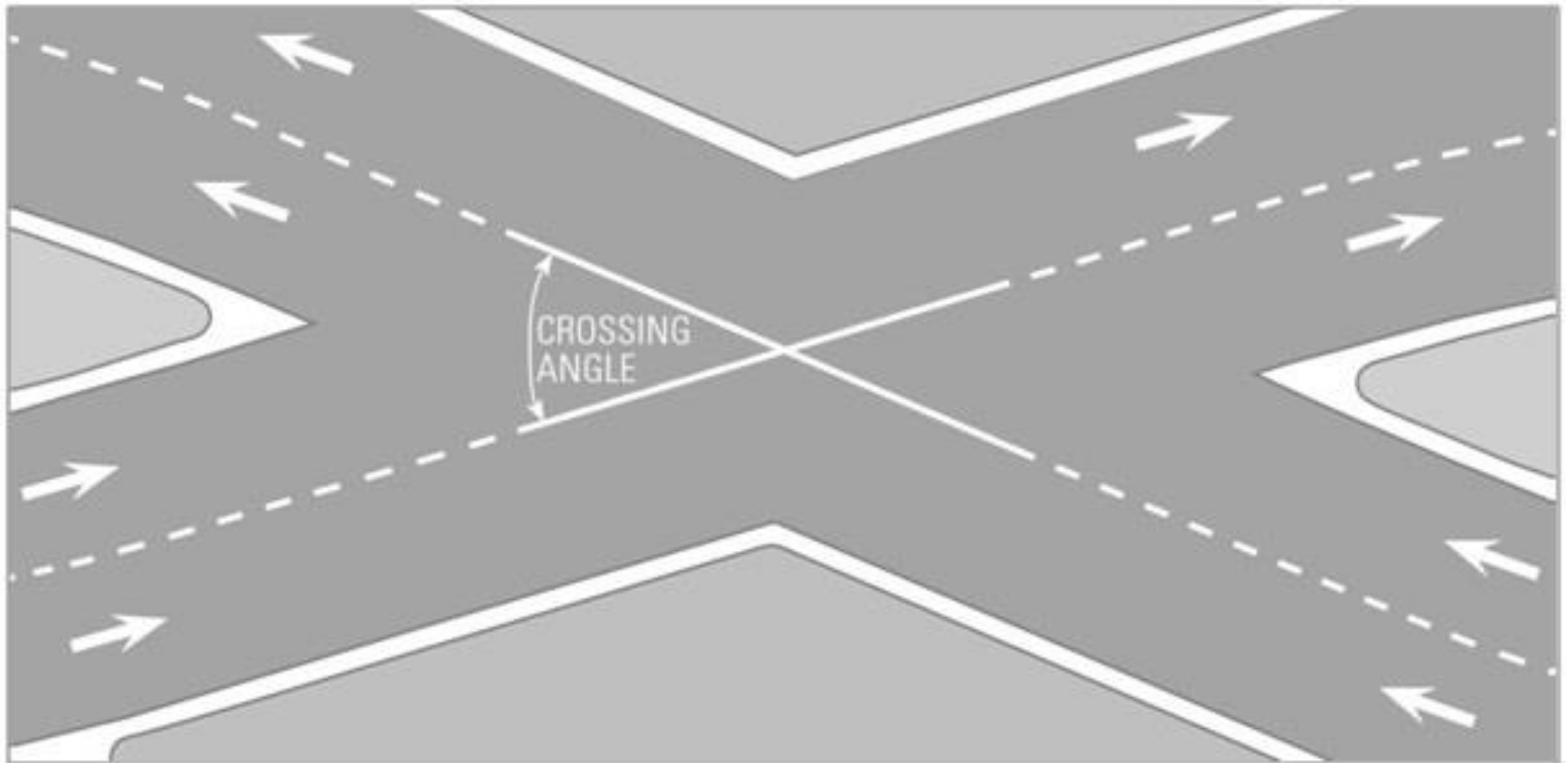


# Design Speed (25 ~ 35 mph)

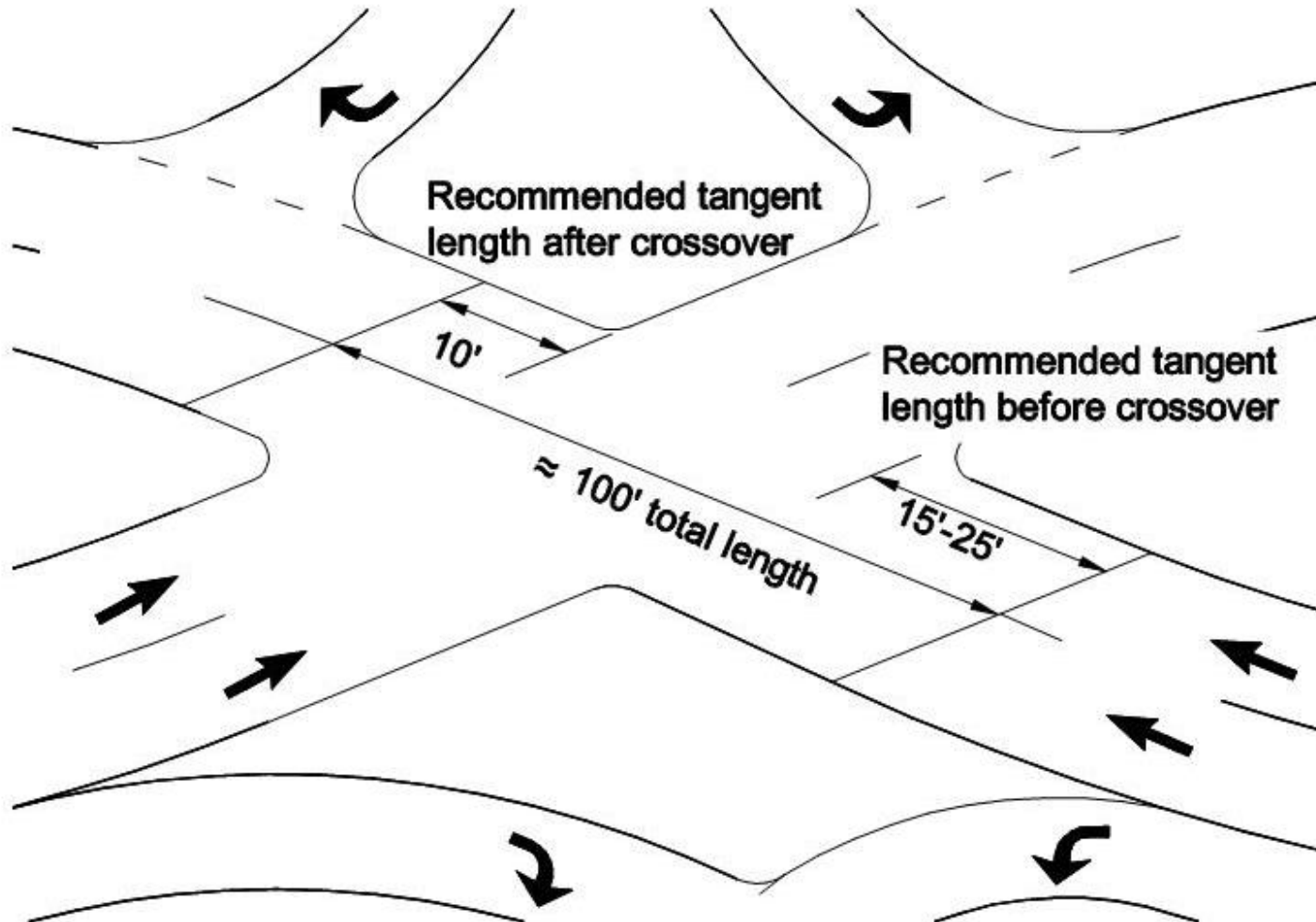


# Crossover angle

Typically 30 to 60 degrees

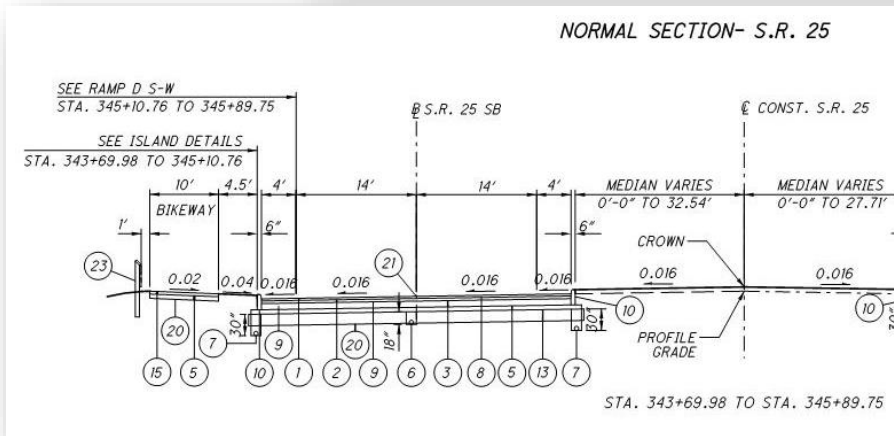
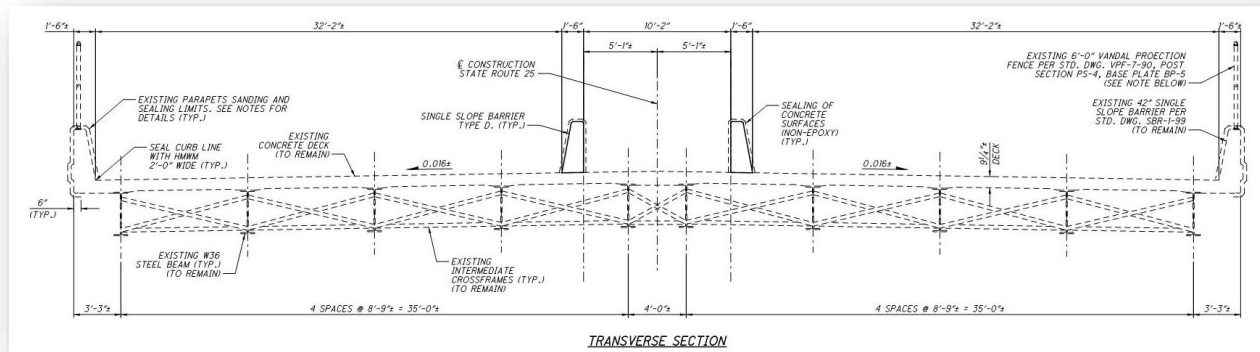


# Crossover Tangent



# Additional Features

## Pedestrian and Bike Facilities



# Additional Features

## Pedestrian and Bike Facilities

**A) Center Walkway, Single Structure**  
*MO 13 - Springfield, MO*



**B) Center Walkway, Single Structure**  
*Botts Rd. - Branson, MO*



# Additional Features

## Landscaping

- Native flowering plants
- Spring flowers, green summer, fall color, winter berries





# Schedule

## Fall 2016

Embankment / retaining wall / temp. pavement  
(no daytime lane closures)



# Schedule

## **Spring 2017**

- SR25 one lane each direction
- Bridge closure for one weekend
- 4 to 5 week off ramp closures

**September 17, 2017 DDI Full Operation**

**October 15, 2017 Final Completion**

