

# Innovative Intersection Improvements in Tennessee

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# Types of Innovative Intersections in TN!

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Roundabouts

J-Turns (RCUT)

Diverging Diamond Interchange

Temporary Compact Roundabout

# ROUNDAABOUTS

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INNOVATIVE INTERSECTION IMPROVEMENT

# Types of Projects Initiating Roundabouts?

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- Traditional/Safety
- Private Development
- Local

# Roundabouts – Traditional/Safety

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Five Points, SR-81 @ SR-353 and Depot St, Jonesborough, TN

State Route 33 @ Everett High Rd and E Harper Ave, Maryville, TN

Future Projects: SR-115, US 129, Alcoa Highway widening and relocation

- Roundabouts to be installed at most interchanges

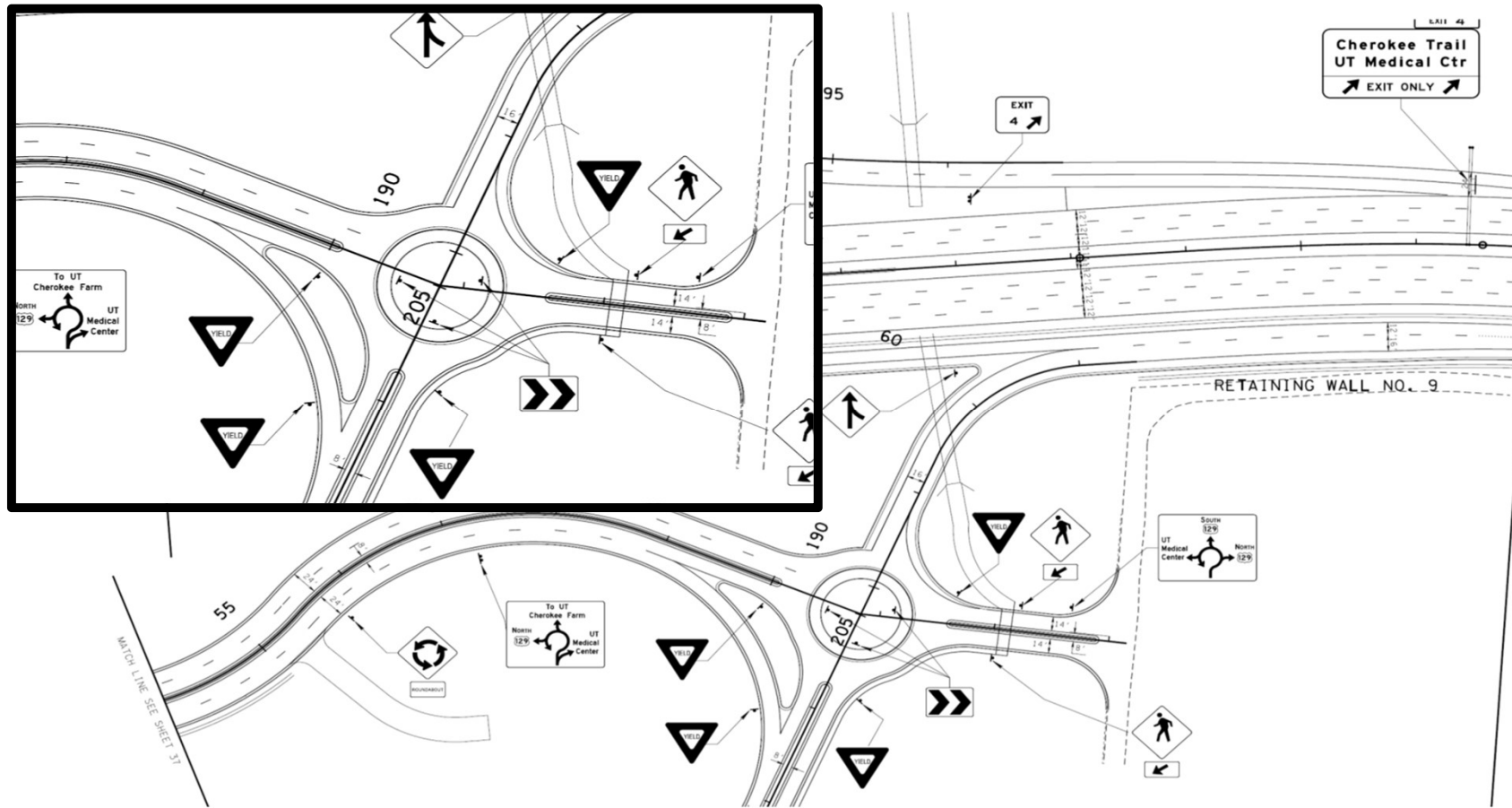
# Five Points



# State Route 33



# Future Projects – Alcoa Highway Project





# Future Projects – Alcoa Highway Project



# Future Projects – Alcoa Highway Project



TN TDOT  
LOCHNER

# Future Projects – Alcoa Highway Project



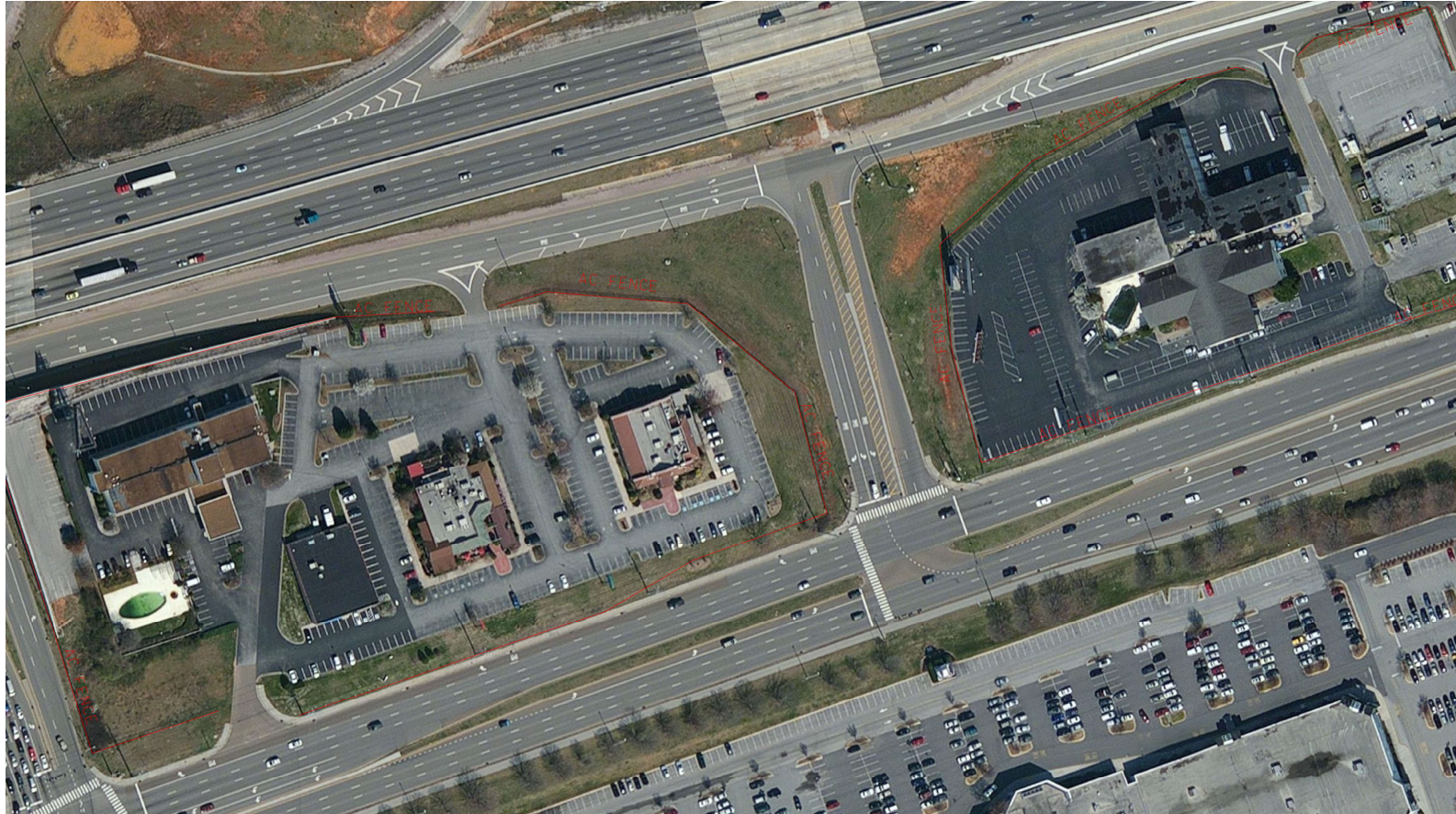
# Roundabouts – Private Development

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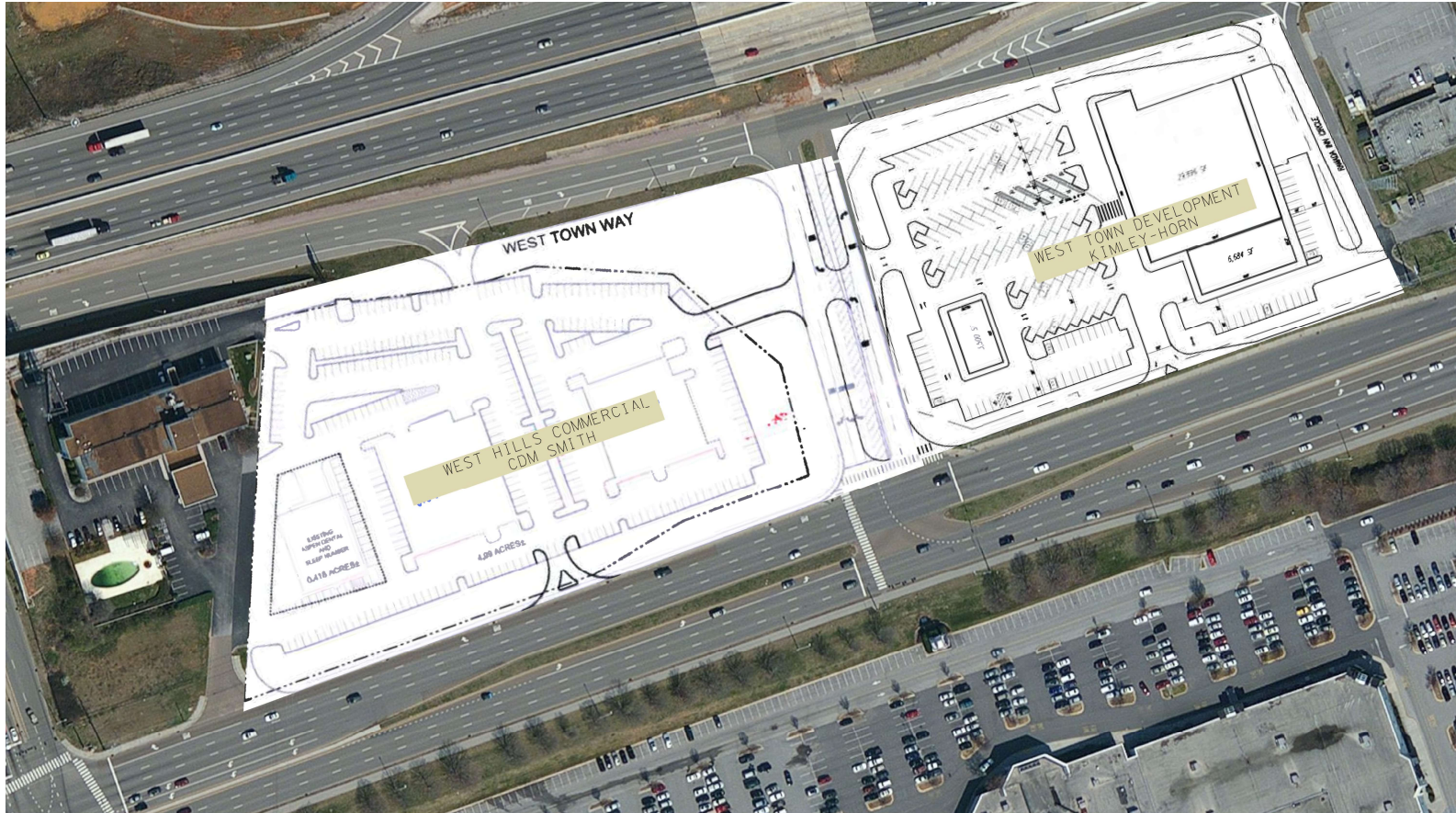
I-40 Exit 380 West Hills Exit Leonard Rogers

CostCo

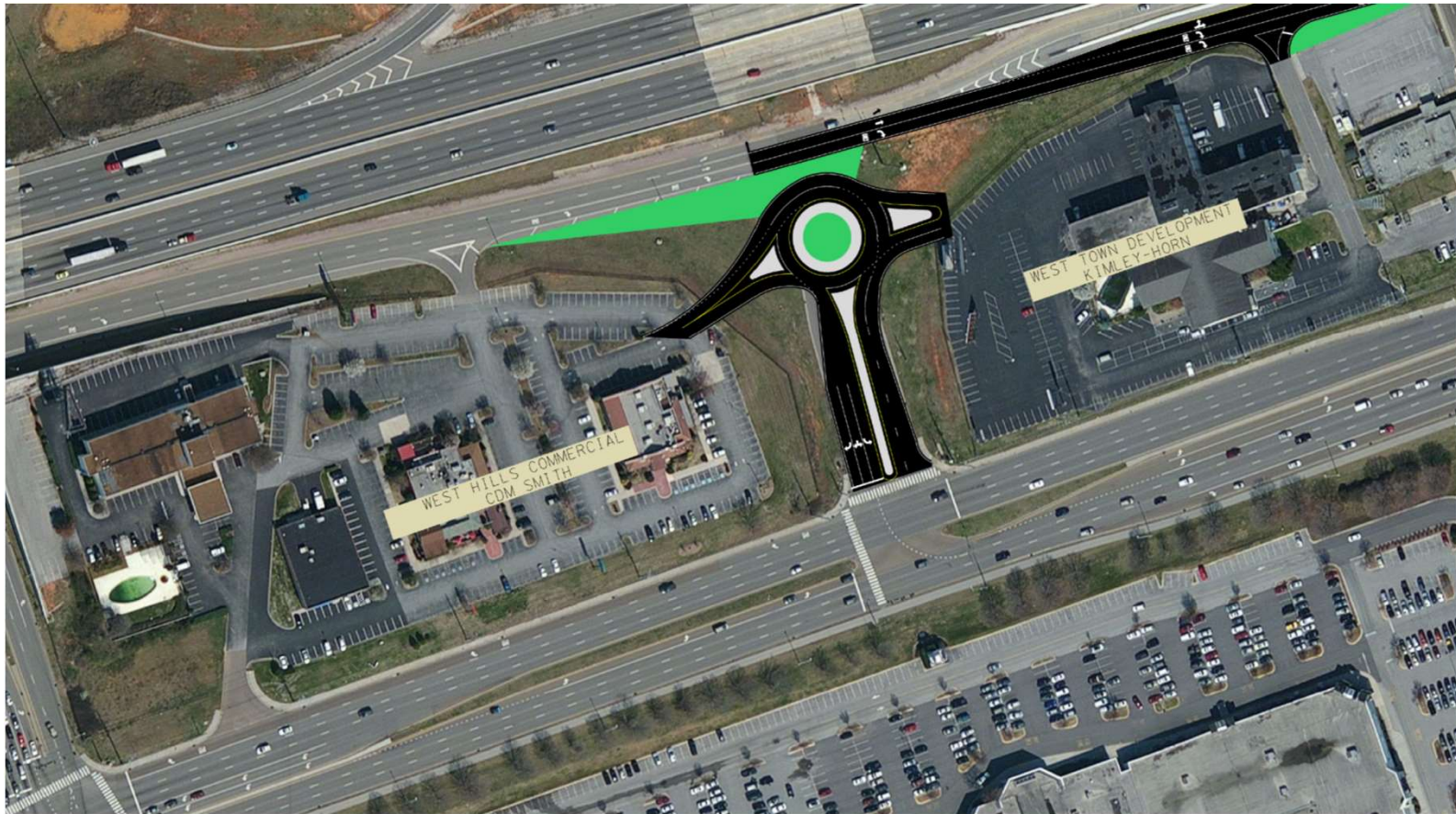
# I-40 Exit 380 West Hills Exit Leonard Rogers



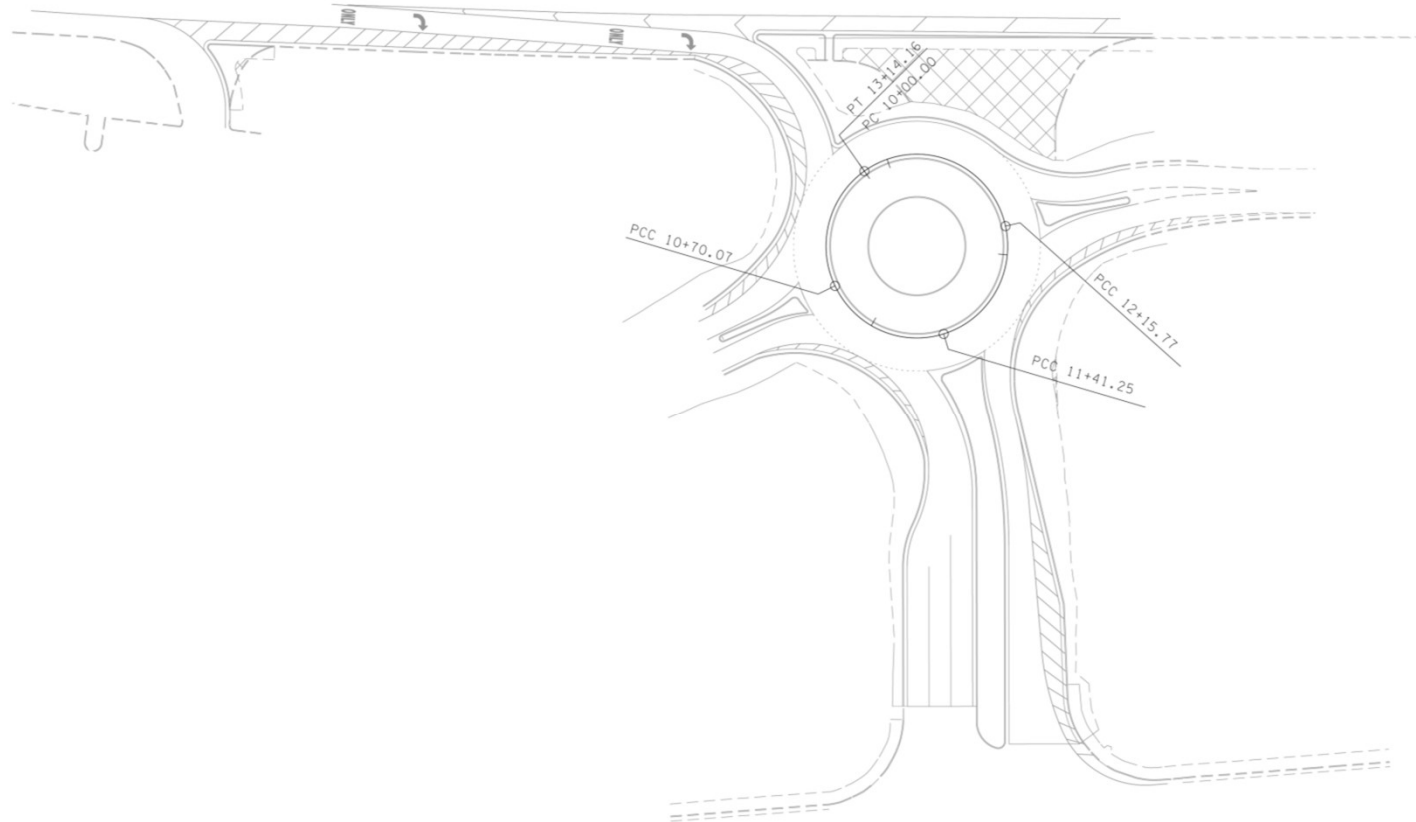
# I-40 Exit 380 West Hills Exit Leonard Rogers



# I-40 Exit 380 West Hills Exit Leonard Rogers



# I-40 Exit 380 West Hills Exit Leonard Rogers





# CostCo Development

As part of this development, a mini roundabout was required in order to allow the traffic signal to function properly



# Roundabouts – Local

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Knox County

Nashville

Knoxville

Chattanooga

# Local



# Local



# Local



# Local



# Local

[https://www.google.com/maps/d/viewer?mid=1H7kzy1lrISMk8rl\\_GLEiXe\\_70kA&ie=UTF8&hl=en&msa=0&z=18&ll=35.022510662829156%2C-85.14567031183134](https://www.google.com/maps/d/viewer?mid=1H7kzy1lrISMk8rl_GLEiXe_70kA&ie=UTF8&hl=en&msa=0&z=18&ll=35.022510662829156%2C-85.14567031183134)

23 Roundabouts

# J-TURNS (RCUTS)

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INNOVATIVE INTERSECTION IMPROVEMENT



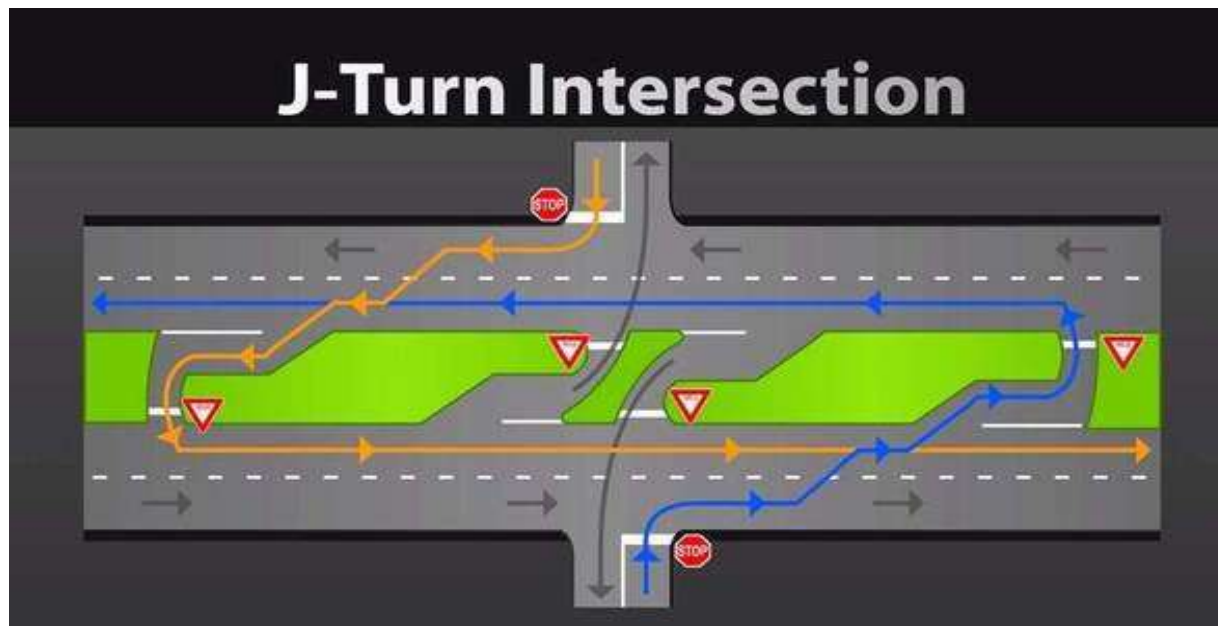
# WHAT IS A J-TURN?

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- J-turns are an alternative to traditional roadway intersections on a four-lane highway
- Instead of motorists crossing fast-moving lanes of traffic to get to the opposing lanes, drivers at a J-turn intersection turn right in the same direction of traffic, merge into the left lane, and then make a left turn in the direction they intend to travel
- A J-Turn requires side road movements to be made indirectly by making a right turn, traveling about a quarter-mile (pending speed and curves) on the divided main road, and then making a U-turn to proceed in the opposite direction on the main road toward the intended destination
- The point of these turns is to greatly reduce – or even eliminate - a significant number of severe crashes common when drivers must cross-over busy highways to reach another road
- Angle Crashes account for over 40% of fatal crashes at intersections, and left turn crashes account for over 20% of fatal crashes at intersections

# J-TURN EXAMPLE

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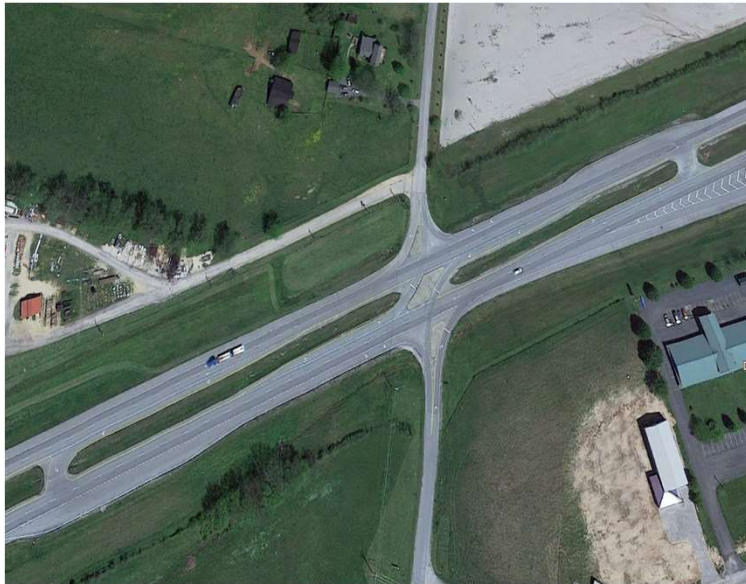


# Maury County State Route 6 J-Turn Projects



# Maury County State Route 6 J-Turn Projects

State Route 6 at Canaan Road



State Route 6 at South Cross Bridge Road



# Maury County State Route 6 J-Turn Projects

State Route 6 at Canaan Road



State Route 6 at South Cross Bridge Road



# Maury County State Route 6 J-Turn Projects

Canaan Road at State Route 6



South Cross Bridge Road at State Route 6



# State Route Road Safety Audit J-Turn Projects

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- Due to the high number of fatal and other severe crashes at both the Canaan Road and South Cross Bridges Road intersections. A Road Safety Audit was performed in 2009
- It was determined that both of the intersections needed to be improved
- After a site review, and several other improvement options being considered, the RSA Team selected J-Turn improvements at both sites
- The J-Turns were completed in August 2010
- A crash summary of the intersection area showed an improvement after the installation of the J-Turns, with no further fatal or severe injury crashes

# State Route 6 Project Crashes Before and After the Completion of the J-Turns

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State Route 6 @ Canaan Road	FATAL	INCAPACITATING	NON-SEVERE INJURY	PROPERTY DAMAGE
Crashes 2000-2010	2	6	18	16
Crashes 2010-2019	0	0	0	11

State Route 6 @ South Cross Bridge Road	FATAL	INCAPACITATING INJURY	NON SEVERE INJURY	PROPERTY DAMAGE
Crashes 2000-2010	2	1	2	14
Crashes 2010-2019	0	0	3	20



# Other J-Turn Projects

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- MONROE COUNTY SR 33 @ WALMART ENTRANCE
- CROCKETT COUNTY SR 20 @ CHESTNUT BLUFF ROAD

# Crockett County and Monroe County

Crockett County State Route 20 @ Chestnut Bluff Road.



Monroe County State Route 33 @ Walmart Entrance.



# Crockett County and Monroe County Crash Comparison

CROCKETT COUNTY STATE ROUTE 20 @  
CHESTNUT BLUFF ROAD

Pre and Post J-Turn Crash Comparisons

	Fatal	Incapacitating	Non-Severe Injury	Property
2000-2007	0	1	10	39
2007-2019	0	0	2	16

MONROE COUNTY STATE ROUTE 33 @  
WALMART ENTRANCE

Pre and Post J-Turn Crash Comparisons

	Fatal	Incapacitating	Non-Severe Injury	Property
2008-2013	1	8	8	9
2013-2019	0	0	0	3

# Diverging Diamond

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INNOVATIVE INTERSECTION IMPROVEMENT

# Current and Future DDI Locations

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Interstate 40 @ State Route 66

Interstate 26 @ State Route 345

# I-40 @ SR 66 – Traffic Analysis

60% of Northbound traffic is destined for I-40 West

	<u>2012</u>	<u>2032</u>
I-40 Average Daily Traffic =	78,050	130,020
SR-66 Average Daily Traffic =	40,760	77,250

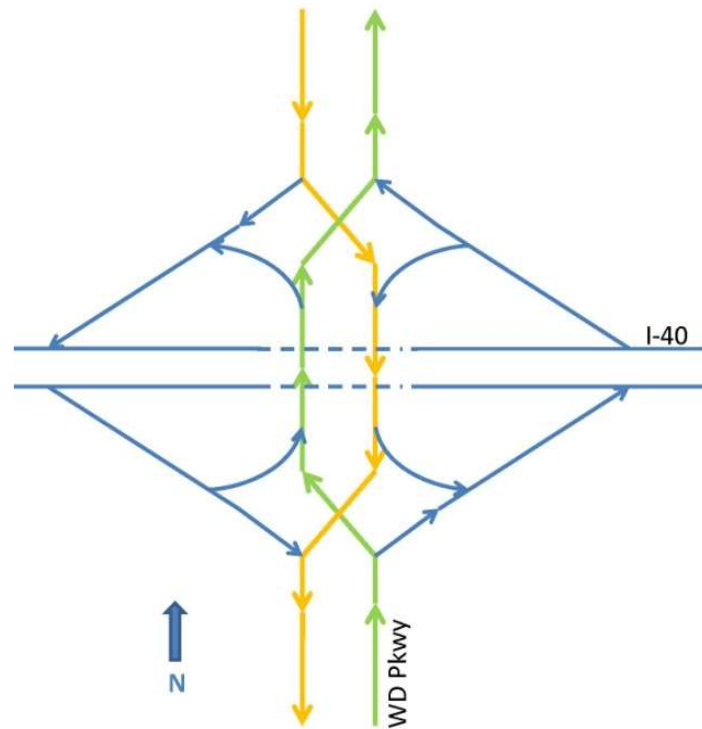




# I-40 @ SR 66 – Other Options



**I-44 & Route 13 in Missouri**



**Proposed Movements for  
Exit 407**



# I-40 @ SR 66 – Construction Begins

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Project was let to Construction on February 14, 2014

Contract was awarded to J & M Grading Division LLC

Contract Estimated Costs: \$15,647,552.60

Set to be built in 3 phases

- Each phase varies the impacted roadways

Construction began on March 12, 2014

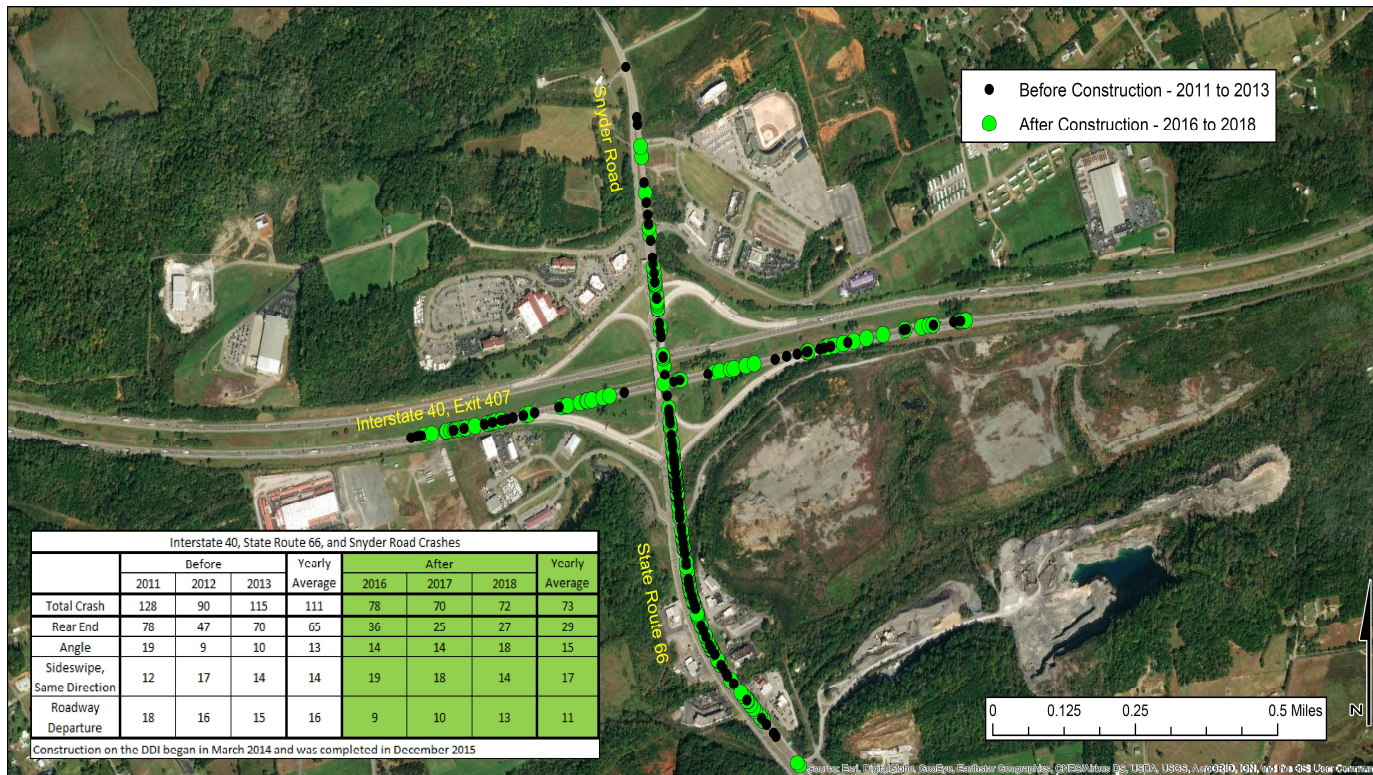
# I-40 @ SR 66 – Post Construction Aerial



# I-40 @ SR 66 – Post Construction Aerial



# I-40 @ SR 66 – Before and After Crashes



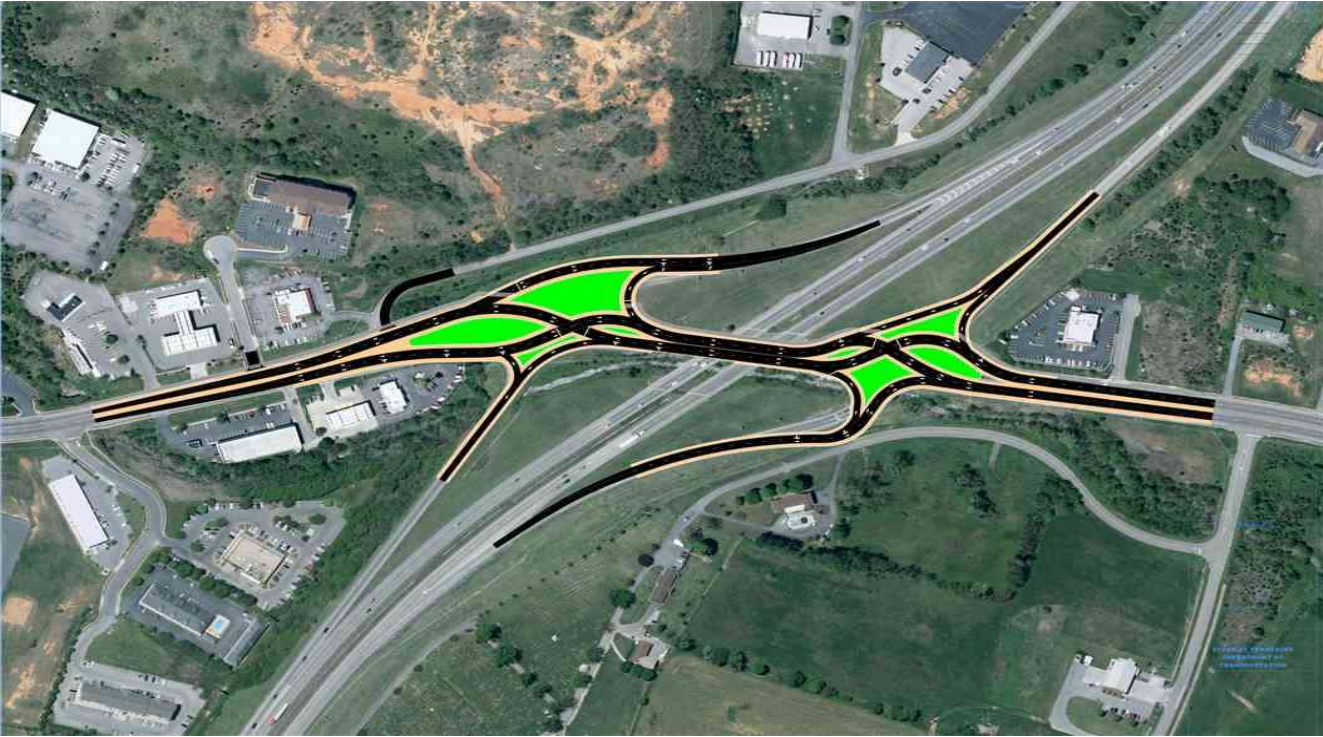
# I-40 @ SR 66 – Before and After Crashes

Interstate 40, State Route 66, and Snyder Road Crashes								
	Before			Yearly Average	After			Yearly Average
	2011	2012	2013		2016	2017	2018	
Total Crash	128	90	115	111	78	70	72	73
Rear End	78	47	70	65	36	25	27	29
Angle	19	9	10	13	14	14	18	15
Sideswipe, Same Direction	12	17	14	14	19	18	14	17
Roadway Departure	18	16	15	16	9	10	13	11

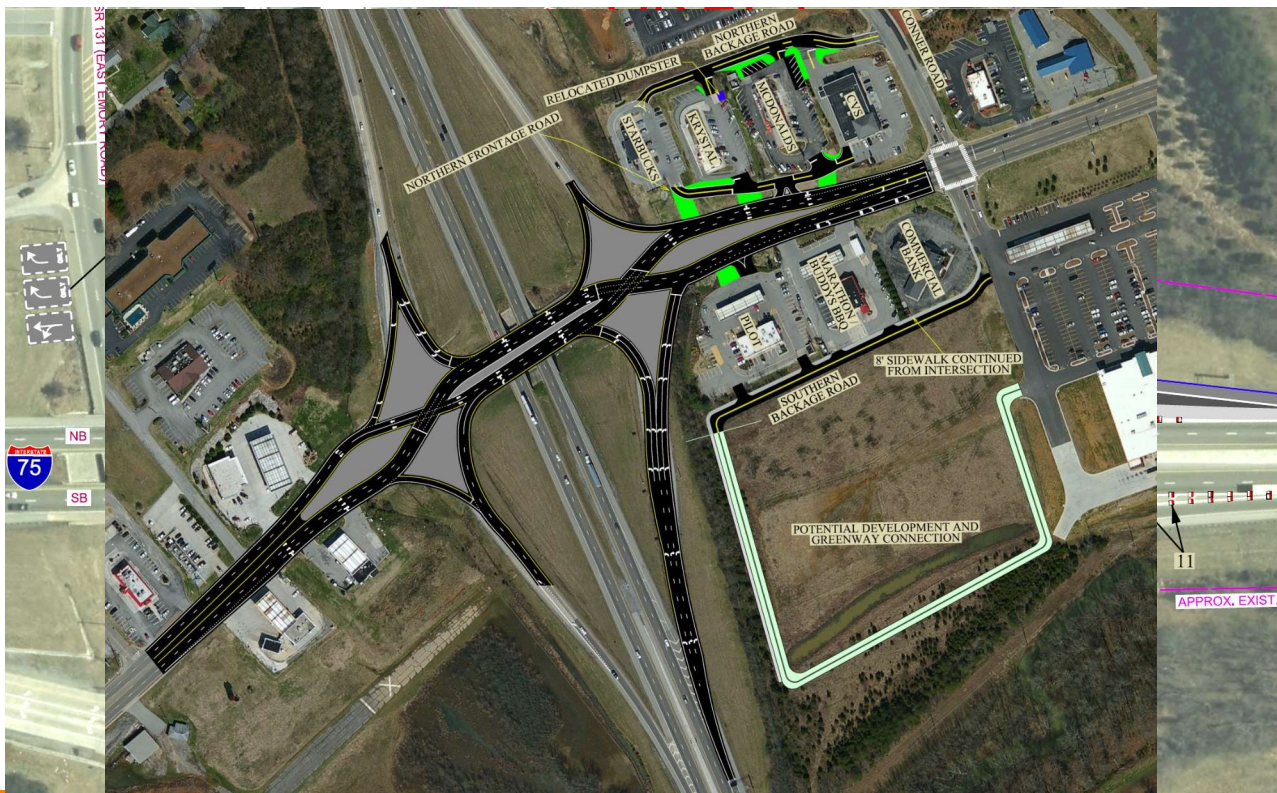
Construction on the DDI began in March 2014 and was completed in December 2015

	<u>2011-2013</u>	<u>2016-2018</u>
<b>Incapacitating Injury Crashes</b>	$6 = 2 \text{ Crashes/Year}$	$4 = 1.33 \text{ Crashes/Year}$
<b>Other Injury Crashes</b>	$52 = 17.3 \text{ Crashes/Year}$	$42 = 14 \text{ Crashes/Year}$

# Under Construction – I-26 @ SR-354



# Future DDI Locations? I-75 at SR-131 - Ramp Queue



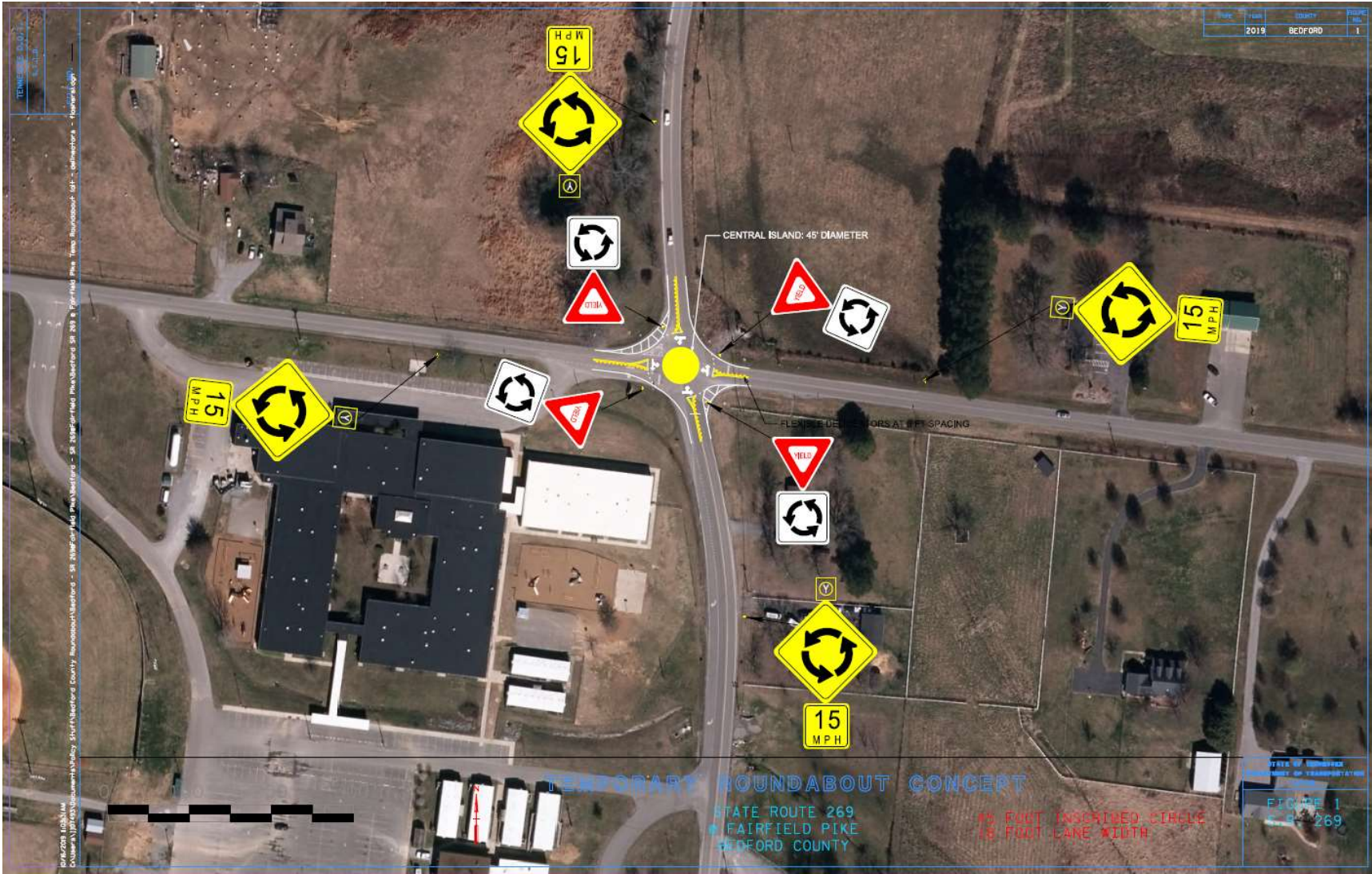
# Temporary Compact Roundabout

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INNOVATIVE INTERSECTION IMPROVEMENT







# THANK YOU ..

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