

**“The Other Left”**  
**96<sup>th</sup> Street/Allisonville Road**



A Presentation Brought to you by the City of Fishers Engineering Department  
CHA Consulting, Inc. and A & F Engineering

Jeff Hill, P.E., PTOE  
Dave Henkel, P.E., PTOE  
Joe Rengel, P.E., PTOE



Purdue Road School – March 8, 2017

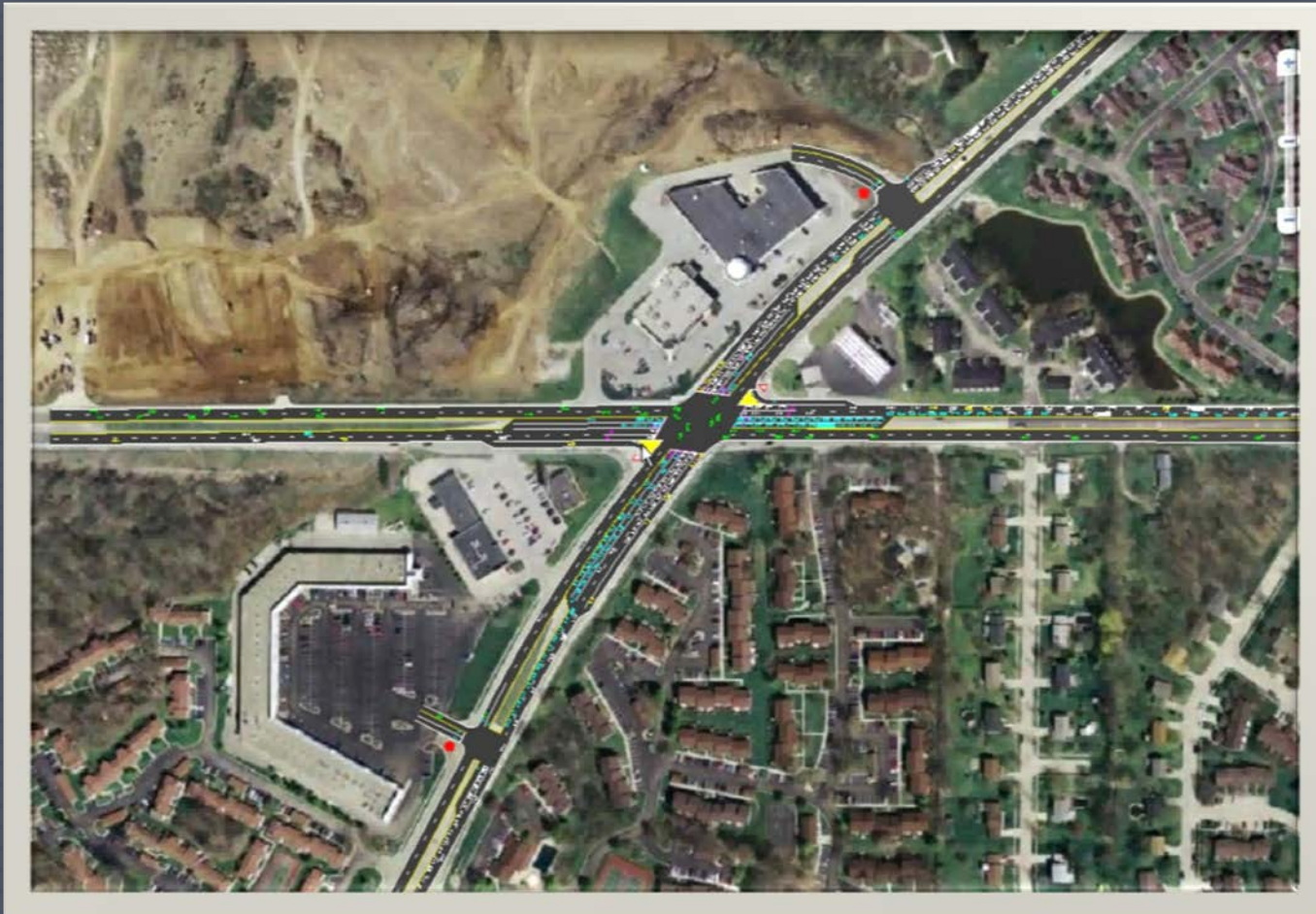
# Presentation Agenda

- Project Overview
- Preliminary Engineering
- Geometric Design
- Public Outreach
- Constructability Challenges
- Traffic Design
- Before/After Comparison
- Summary

# Project Overview – Existing Intersection

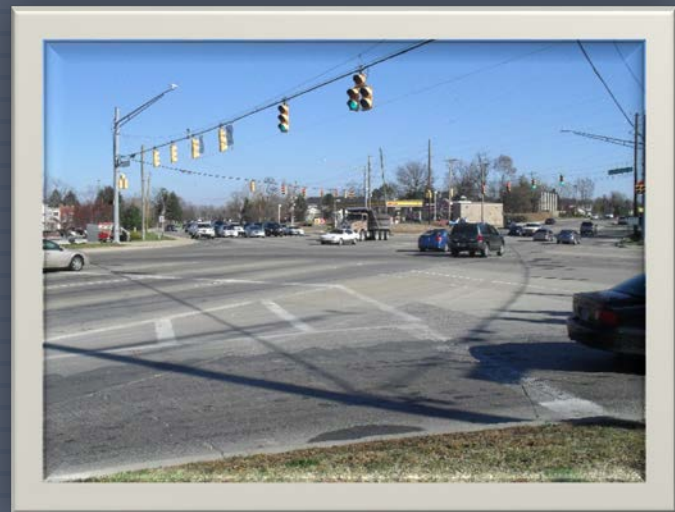


# Project Overview – No Build



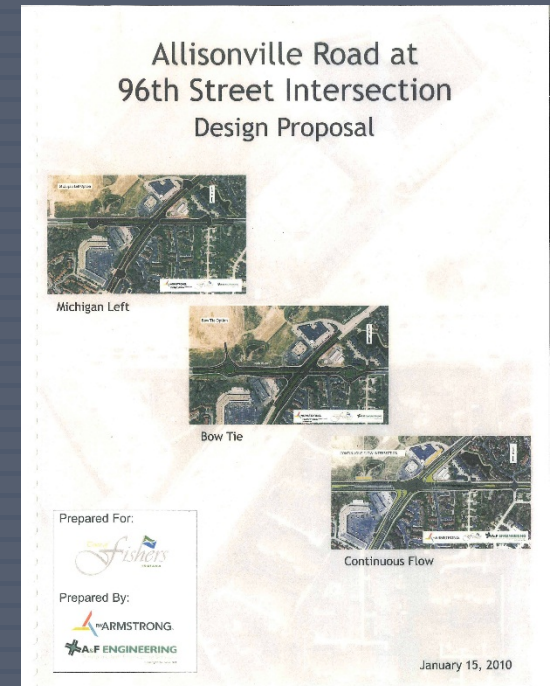
# Project Overview - General

- Need
  - Operationally deficient intersection
  - Severe pavement deterioration
  - Significant additional development anticipated in NW quad
  - Safety
- Funding
  - Local TIF
- Constraints
  - Right-of-way
  - Local business impacts
  - Cost
  - Environment
  - Utilities
  - Solution provides acceptable 20-year LOS



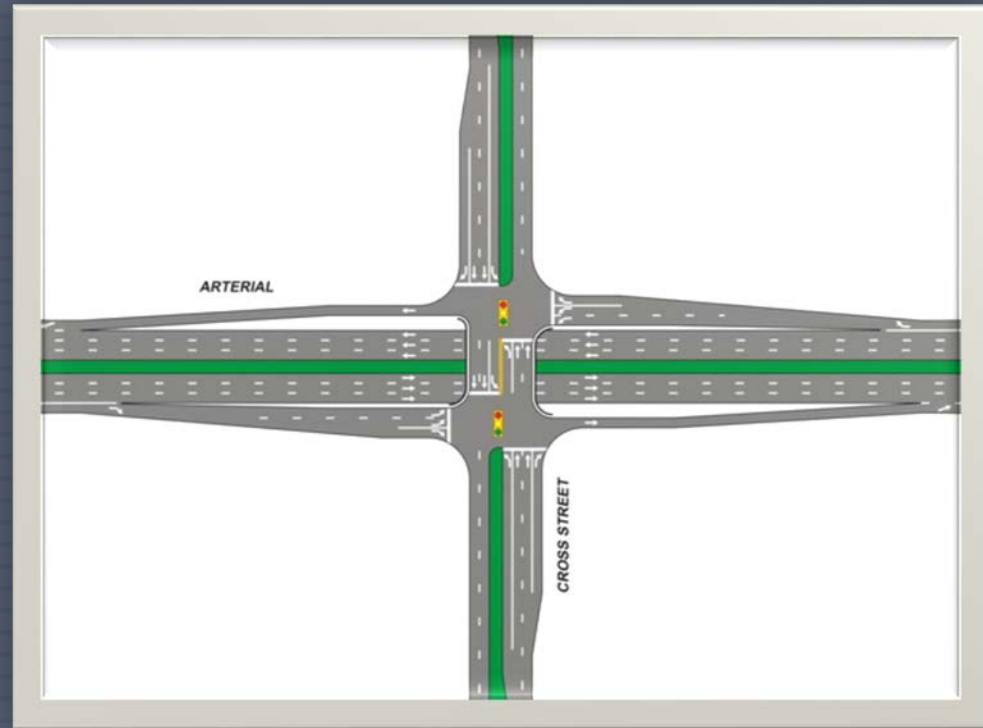
# Preliminary Engineering - General

- Several proposals submitted
- Project stakeholders
  - General public
  - City of Fishers
  - City of Indianapolis
  - NW quadrant developer
  - Adjacent property owners
- Our team investigated 5 potential options



# Preliminary Engineering – Options 1 and 2

- Interchange
- Tight diamond considered but discarded immediately
- Three lane roundabout considered but discarded immediately
- Pros – improved mobility
- Cons – several



# Preliminary Engineering – Option 3

- CFI
- Pros
  - Improved mobility
  - Impacts reduced on 96<sup>th</sup> Street
  - Less utility impact
- Cons
  - Significant impact to intersection corners
  - Driver familiarity





# Preliminary Engineering – Option 3 Synchro

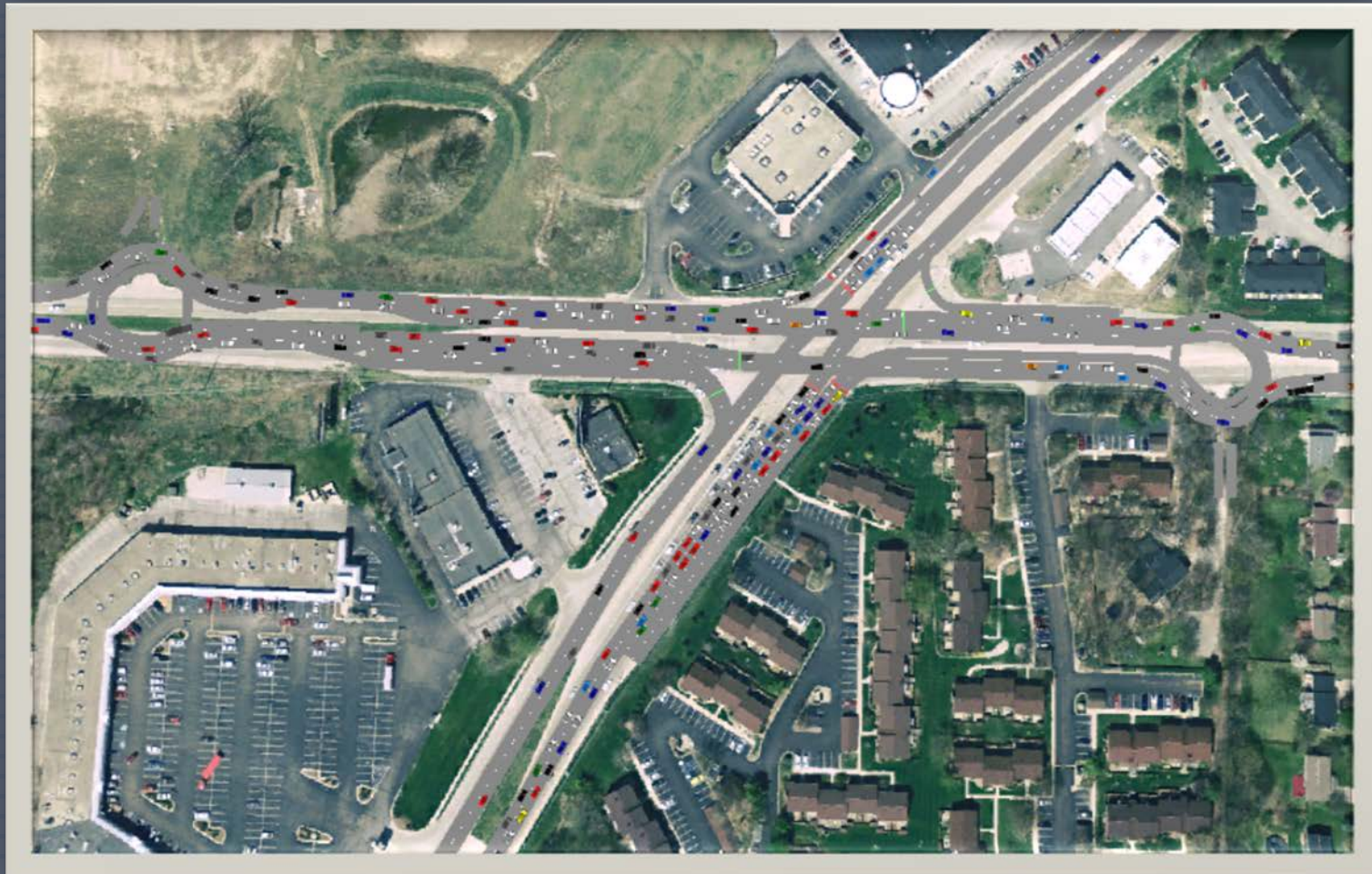


# Preliminary Engineering – Option 4

- Bow-tie
- Pros
  - Improved mobility
  - Drivers familiar with roundabouts
- Cons
  - Significant impact at roundabout intersections
  - Constructability



# Preliminary Engineering – Option 4 VISSIM

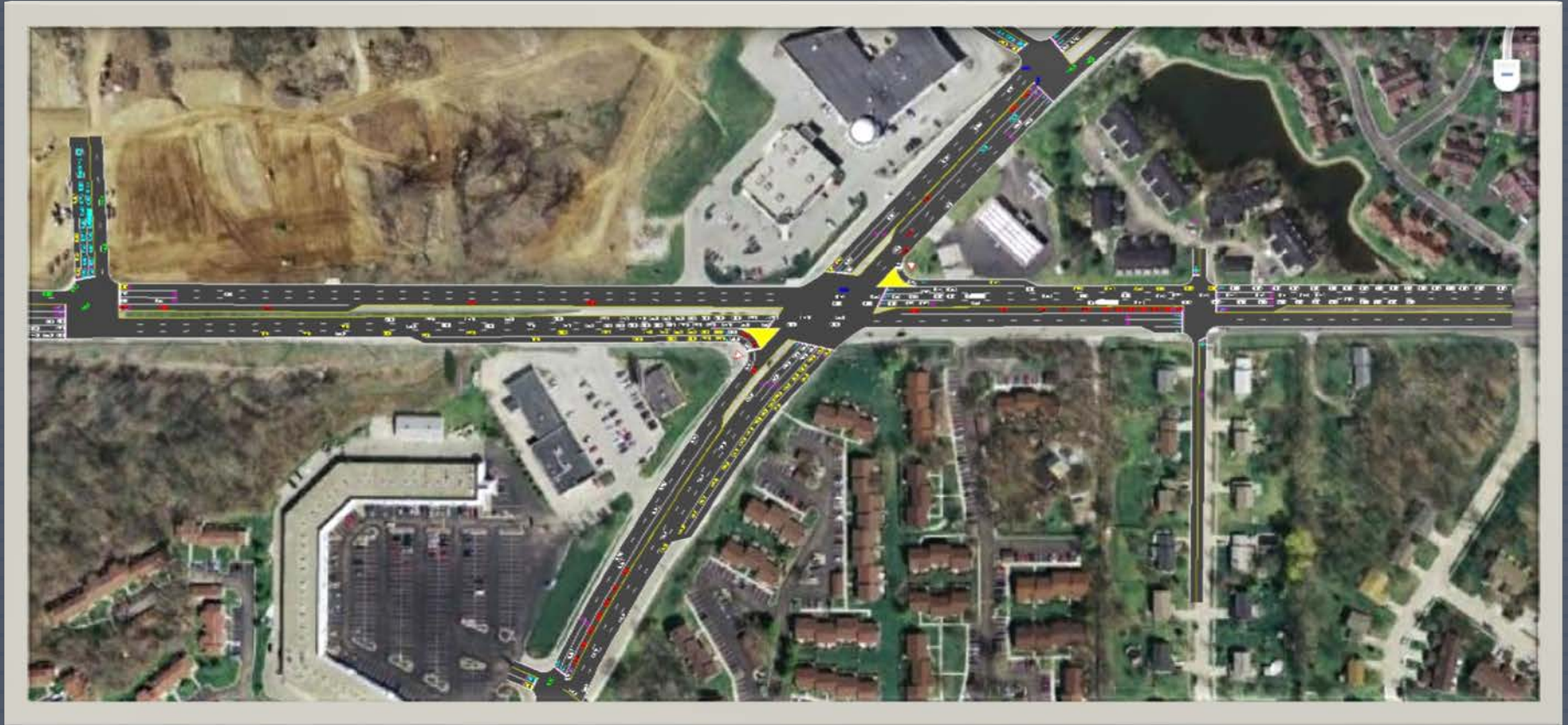


# Preliminary Engineering – Option 5

- Median u-turn
- Pros
  - Improved mobility
  - Synchronized signals
  - Constructability
  - Few property owner impacts
- Cons
  - Driver familiarity



# Preliminary Engineering – Option 5 Synchro



# Preliminary Engineering – Preferred Option

- Median u-turn
  - Best optimization of
    - Traffic flow
    - Construction cost
    - Property impact
- Constraint matrix

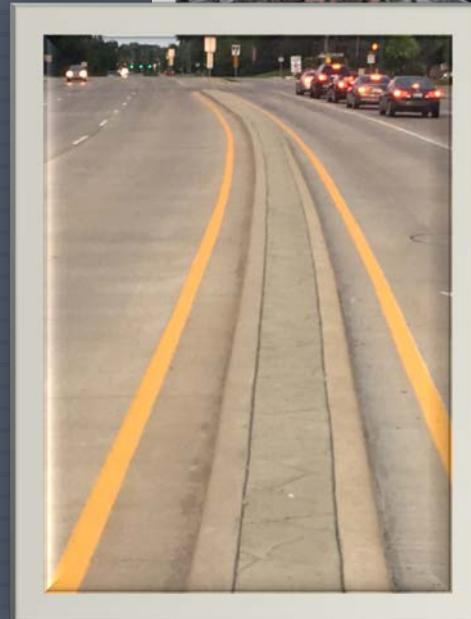


		Improvement Option		
		Bow Tie	Continuous Flow	Median U-turn
Constraint	Traffic Flow	Green	Yellow	Green
	Construction Cost	Red	Green	Yellow
	Property Impact	Yellow	Red	Green
	Overall	Yellow	Yellow	Green

Green = Best  
Red = Worst

# Geometric Design - Components

- “Right to go left” capacity
- Truck accommodation at turn intersections
- MSE walls
- Driveway grades
- Concrete vs Asphalt
- Narrow Medians
- Curb/Gutter
- Storm Sewer



# Geometric Design - Challenges

- Dam and cemetery at north end of project
- Environmental
  - White River flood plain (mitigation)
  - Indiana Bat
  - City of Indianapolis flora permit
- Pedestrian/bicycle accommodations
  - Bike lanes/railings
- Utilities
- Driveways in close proximity
- Accommodate NW quad property owner
- Other project coordination (I-465/Allisonville closure)
- Gateway signage





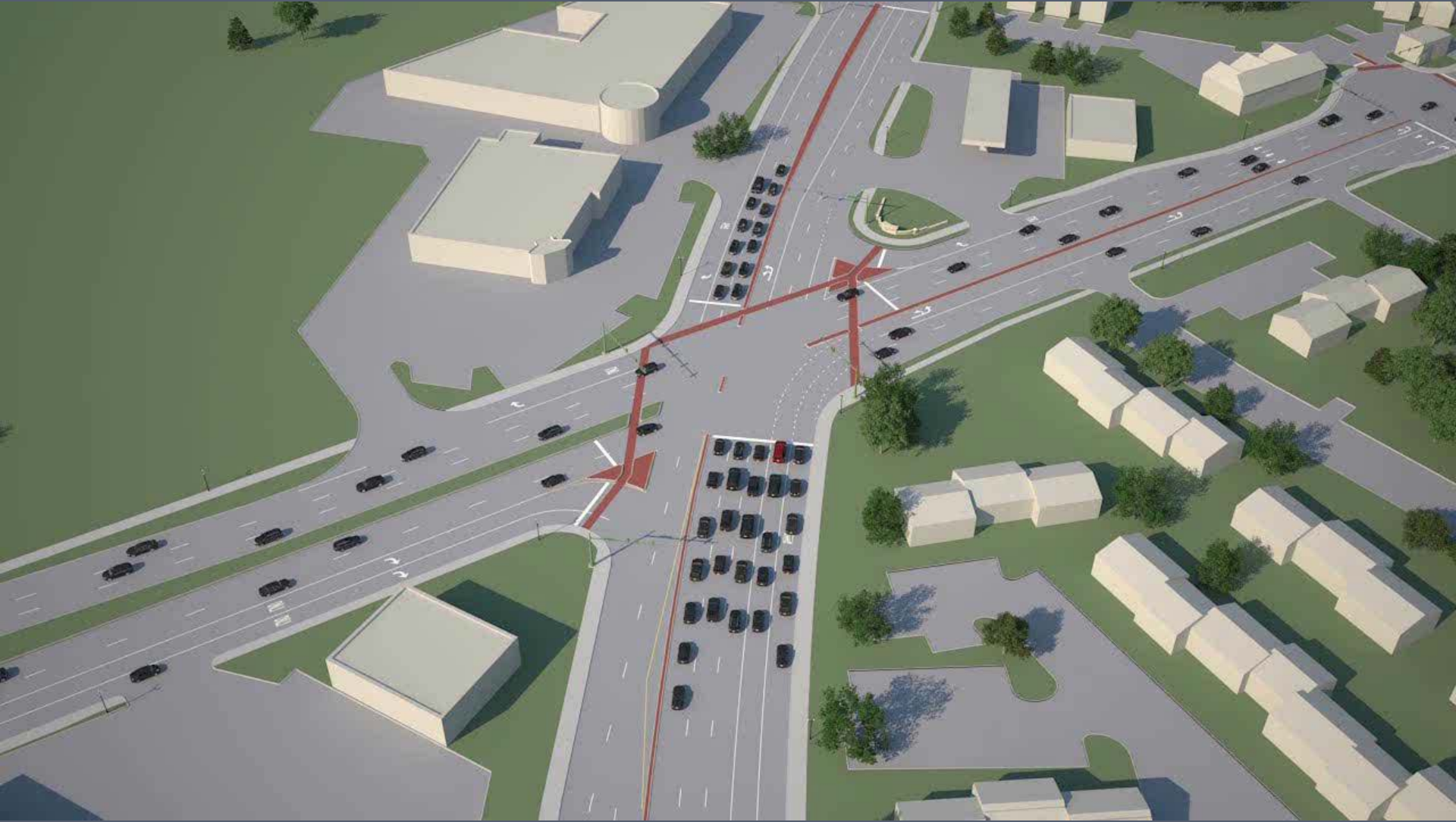
# Public Outreach

- City of Indianapolis Interlocal Agreement
- Public meetings - 2
- Website
- Driver education



[www.fishers.in.us/index.aspx?NID=381](http://www.fishers.in.us/index.aspx?NID=381)

# Public Outreach



# Constructability Challenges - Accessibility

- Keep two through lanes open at all times
- Pedestrian crossing locations
- Always allow left turning movements



# Constructability Challenges - General

- Two lanes open at all times
- Limited right of way
- Non-standard intersection type
- High traffic volume



# Traffic Design - MOT

- Two lanes are open at all times
- During construction, reduce lane widths to 10 feet
- Pre-ordered the sign structure to allow MOT flexibility
- Did not go back and forth on left turn being allowed at main intersection

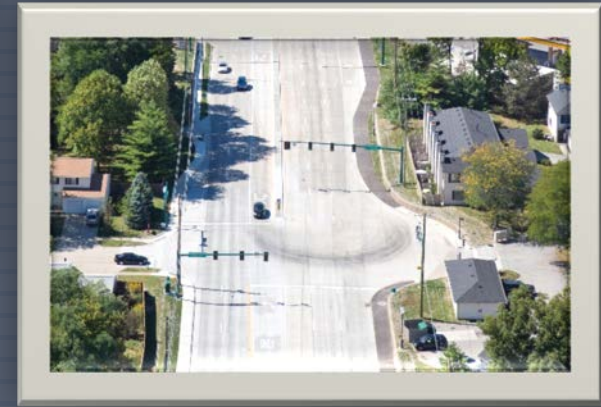
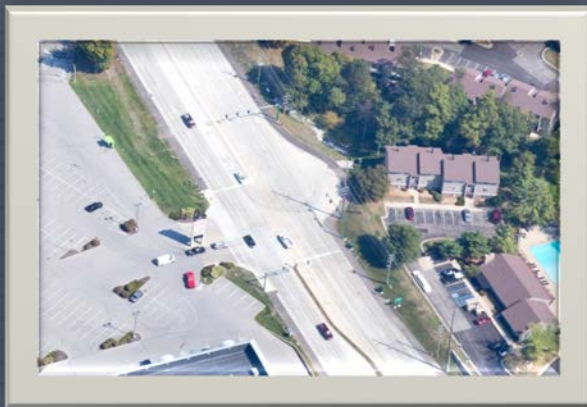
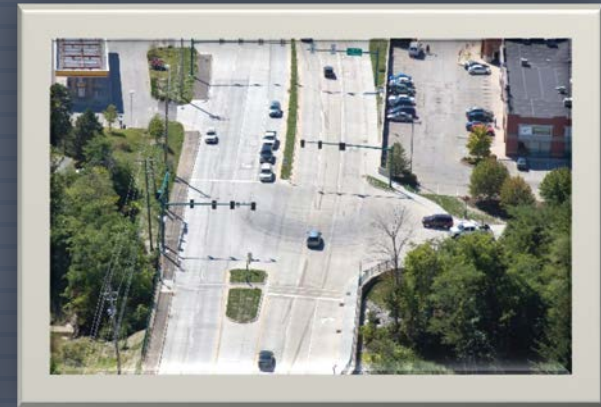
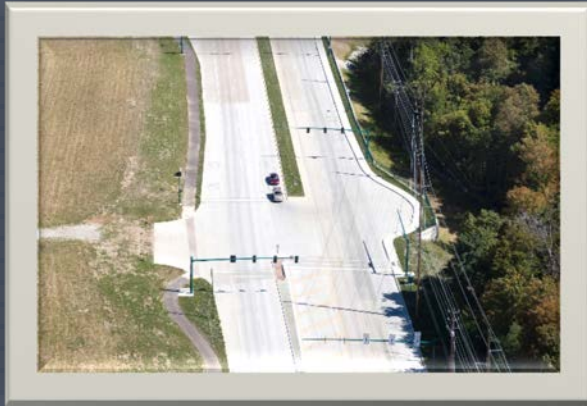


# Traffic Design - Signals

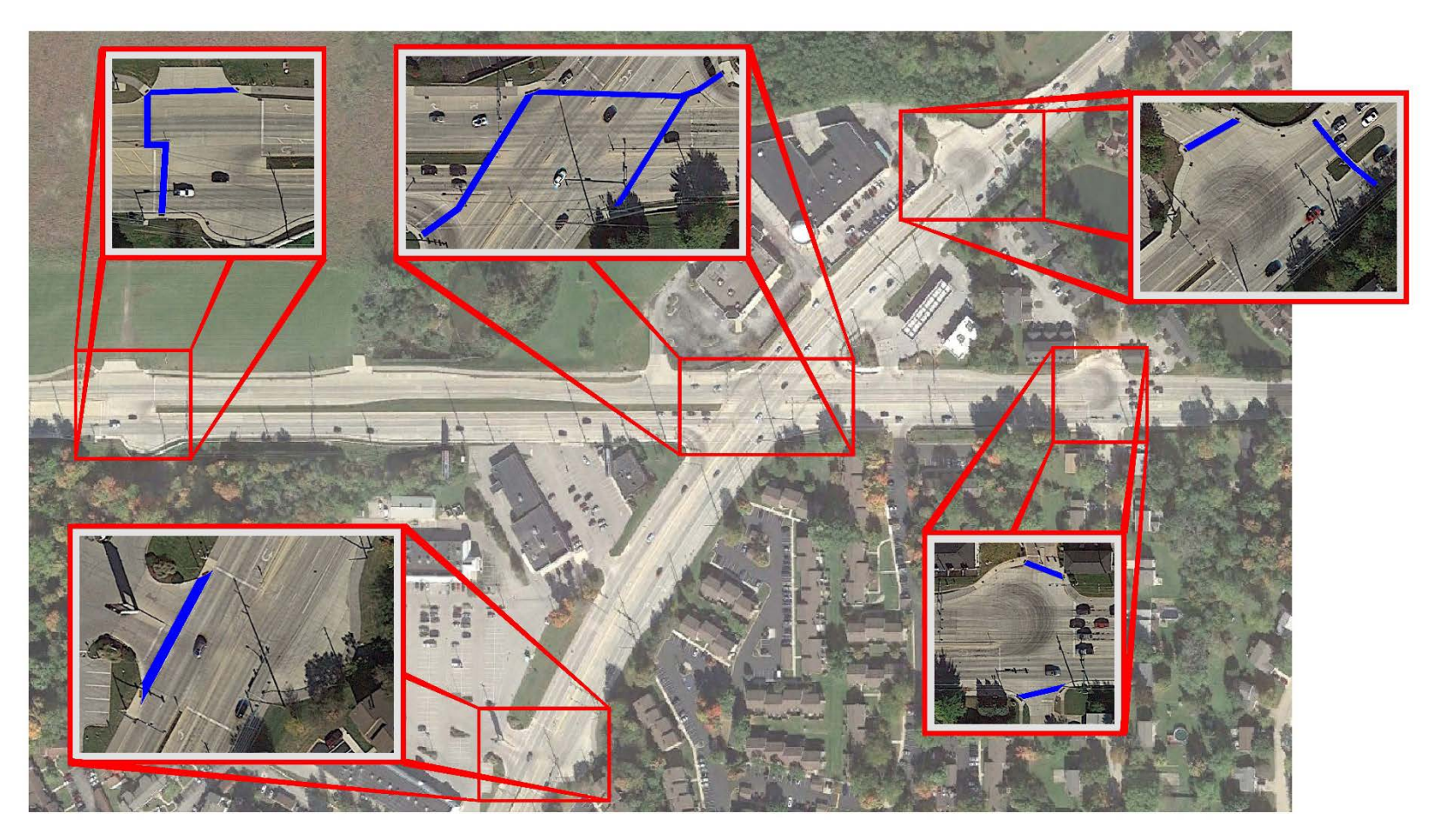
- Pedestrian crossings were placed where pedestrian clearance time would be safest and least impactful to traffic flow
- Timing plans during construction
- Protected or permissive u-turn movements
- Interconnection/adaptive system
- Stop here on red signs at loons



# Intersection Configurations



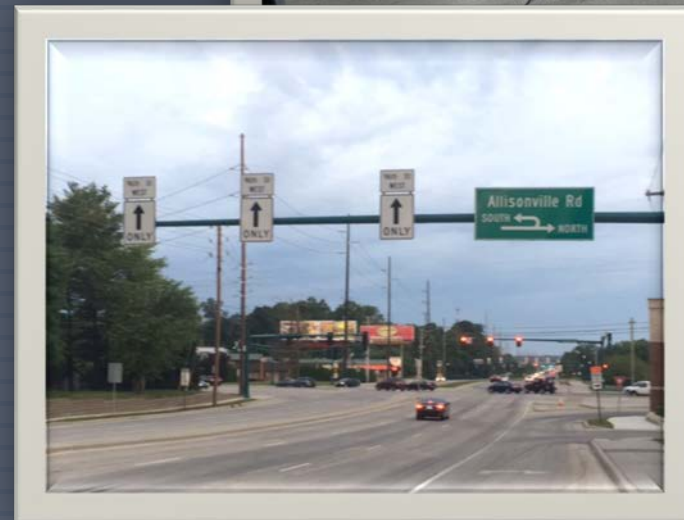
# Pedestrian Crossing Locations





# Before/After Comparison - LOS

- Just prior to construction (2012)
  - AM Peak – LOS E
  - PM Peak – LOS E
- Just after construction (2013)
  - AM Peak – LOS B
  - PM Peak – LOS B



# Before/After Comparison – Travel Time

- Overall improved travel time

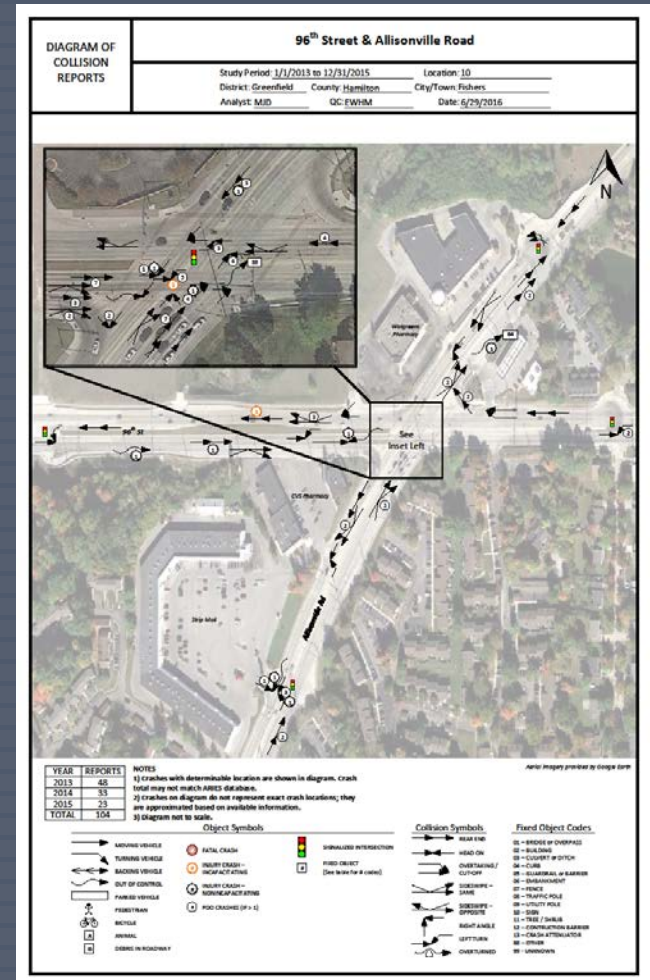
96th Street & Allisonville Road Before-After Median U-Turn Travel Time Study (Times in Seconds)													
	TRAVEL TIME (sec)	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
AM PEAK	Before	181	133	113	163	117	215	122	113	134	139	151	112
	After	189	83	109	207	123	105	170	118	129	178	116	88
	Difference	8	-50	-4	44	6	-110	48	5	-5	39	-35	-24
PM PEAK	Before	230	137	121	142	115	105	205	234	184	140	136	96
	After	155	103	108	223	113	116	172	122	97	181	88	88
	Difference	-75	-34	-13	81	-2	11	-33	-112	-87	41	-48	-8

# Before/After Comparison - Volume

- Peak hour traffic prior to construction (2012)
  - AM Peak – 3,992 VPH
  - Mid-day Peak – 3,078 VPH
  - PM Peak – 4,853 VPH
- Peak hour traffic just after construction (2013)
  - AM Peak – 3,912 VPH
  - Mid-day Peak – 3,062 VPH
  - PM Peak – 4,823 VPH

# Before/After Comparison - Safety

- Preconstruction (almost all rear end & right angle)
  - 2010: 25 Crashes
  - 2011: 31 Crashes
  - 2012: 47 Crashes
- 2012 and 2013 crash data generally disregarded
- Post construction and MPO study for 2013-2015 Crash data (all different types of crashes)
  - 2013: 48 Crashes
  - 2014: 33 Crashes
  - 2015: 25 Crashes
  - 2016: 34 Crashes



# Crashes by Type

	<u>2012</u>	<u>2013</u>	<u>2015</u>	<u>2016</u>	<u>Total</u>
Right Angle	5	8	4	10	27
Left Turn	5	10	6	1	22
Rear End	24	21	8	15	68
Sideswipe	7	5	4	7	23
Right Turn	3	1	2	0	6
Head On	2	0	0	0	2
Other	<u>1</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>6</u>
Total	47	48	25	34	154

# Before/After Comparison – Additional Thoughts

- Improved capacity, especially for the thru movement
- Reduced overall travel time (cycle length reduced from 160 sec. to 100 sec.)
- Did we send everyone away? Traffic consistent from 2013 to 2015
- Continued education (flyers, PD warnings)
- Neighborhood cut through traffic
- Improved safety



# Before/After Comparison – Future Possibilities

- Illuminated overhead lane signs
- Permissive/protective lefts
- Flashing yellow arrows
- Pavement markings for lane shifts
- Improved signage?
  - NB lane drop
  - “Stop Here on Red”



# Before/After Comparison – Lessons Learned

- Communicate early/often @DriveFishers
- Build what feels intuitive
- Consider building under full closure
- Complete phase changes at night
- Look at lane utilization
- Order signs early
- Confirm, then re-confirm, then re-confirm again with utilities





# Summary - Other Applications

- Median u-turn is a tool in the intersection tool box
- Many other agencies are considering the MUT
  - INDOT, Hamilton County (with roundabouts)
  - SR 135 and Smith Valley Road in Greenwood
  - US 231 in Dale, US 41 at SR 114 in Newton County
  - Wisconsin DOT to replace interchange
  - SR 110 and SR 18 programmed J turns

# Summary - General

- Unique configuration
- Improved level of service
- Drivers have returned
- Businesses – improved access (signal at north & south end of project)
- Improved safety

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Thanks for Listening

Questions?



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