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
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 96th Street
  - Less utility impact
- Cons
  - Significant impact to intersection corners
  - Driver familiarity
Preliminary Engineering – Option 3 Synchro
Bowl-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 – Preferred Option

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

- **Constraint matrix**

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Bow Tie</th>
<th>Continuous Flow</th>
<th>Median U-turn</th>
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<tr>
<td>Traffic Flow</td>
<td>Green</td>
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<td>Green</td>
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<tr>
<td>Construction Cost</td>
<td>Red</td>
<td>Green</td>
<td>Red</td>
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<tr>
<td>Cost</td>
<td>Green</td>
<td>Red</td>
<td>Green</td>
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<tr>
<td>Property Impact</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
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<tr>
<td>Overall</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Green</td>
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</tbody>
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*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
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
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**

<table>
<thead>
<tr>
<th>96th Street &amp; Allisonville Road Before-After Median U-Turn Travel Time Study (Times in Seconds)</th>
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<tbody>
<tr>
<td><strong>TRAVEL TIME (sec)</strong></td>
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<tr>
<td>Left</td>
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<tr>
<td><strong>AM PEAK</strong></td>
</tr>
<tr>
<td>Before</td>
</tr>
<tr>
<td>After</td>
</tr>
<tr>
<td>Difference</td>
</tr>
<tr>
<td><strong>PM PEAK</strong></td>
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<tr>
<td>Before</td>
</tr>
<tr>
<td>After</td>
</tr>
<tr>
<td>Difference</td>
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</table>
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
<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2015</th>
<th>2016</th>
<th>Total</th>
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<td>Right Angle</td>
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<td>Left Turn</td>
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<td>Rear End</td>
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<td>0</td>
<td>6</td>
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<td>0</td>
<td>0</td>
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<td>1</td>
<td>1</td>
<td>6</td>
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<td>Total</td>
<td>47</td>
<td>48</td>
<td>25</td>
<td>34</td>
<td>154</td>
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</table>
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
Thanks for Listening

Questions?

Purdue Road School – March 8, 2017