

# WELCOME

Belmont Avenue and St Asaphs Road Roundabout  
Intersection Improvement Project  
**Public Meeting**

MARCH 27, 2024

# INTRODUCTIONS



- Nathan Parrish, P.E., Consultant Project Manager



- Michael P. Mastaglio, P.E., PTOE, Project Manager

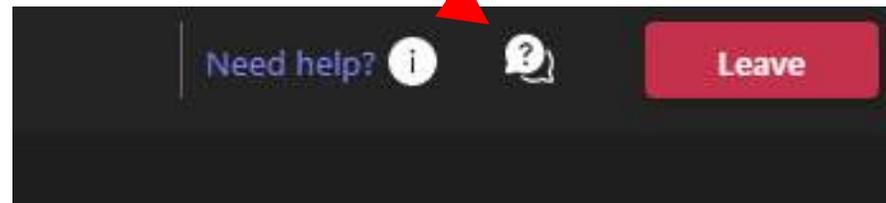


- Andrew Gould, P.E., Project Engineer



# QUESTIONS?

Questions can be submitted by clicking on the Q&A feature located at the top of your screen



Please note the slide number in your question



# WELCOME & PURPOSE

Project Overview & Timeline

Purpose & Project Selection

Highway Safety Manual (HSM) Analysis

Roundabout Education

Design Considerations & Proposed Design

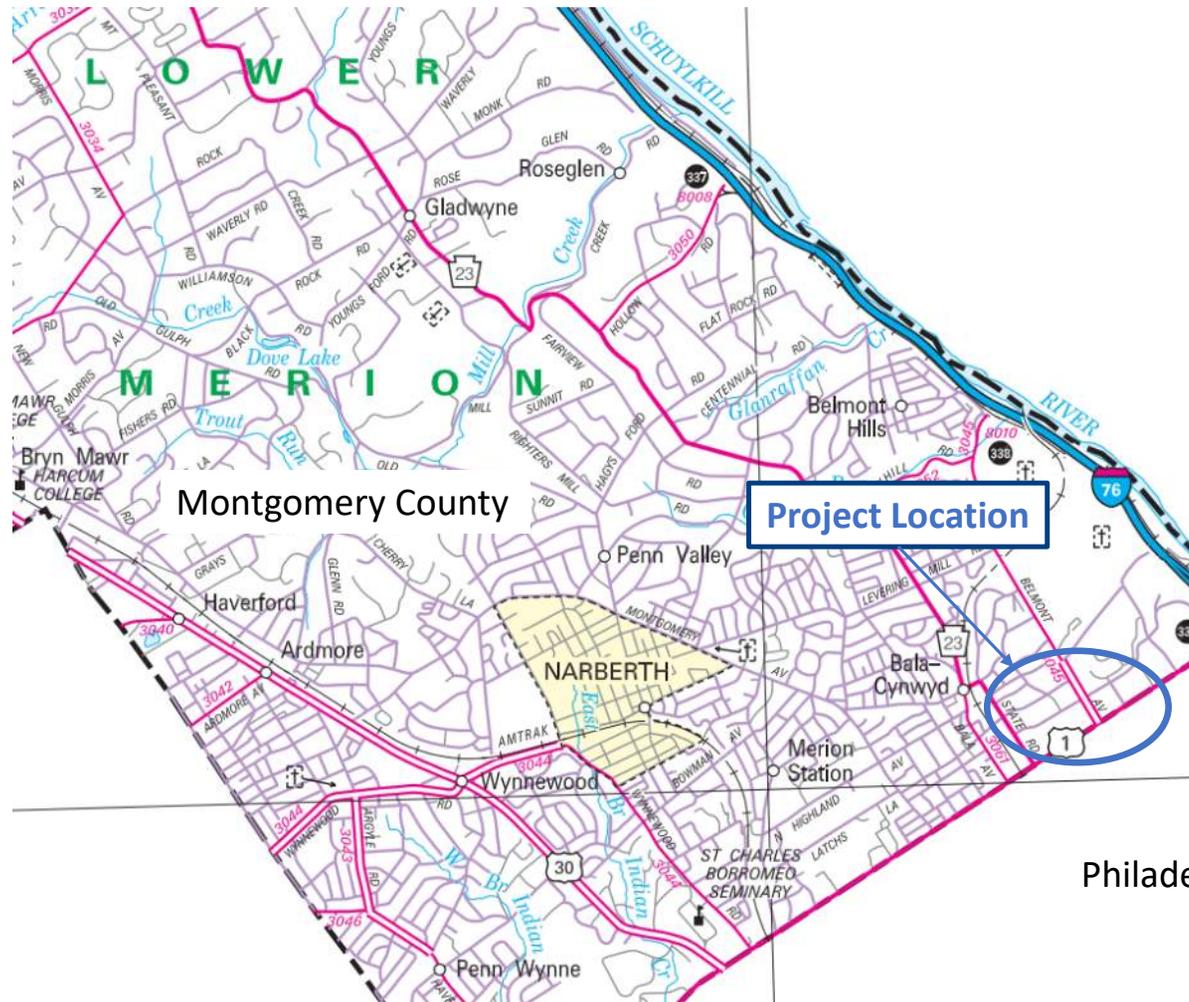
Operations and Safety Considerations

Construction Staging & Next steps

Questions and Answers



# PROJECT OVERVIEW



Philadelphia County



# PROJECT TIMELINE OVERVIEW

## Project Related Activities/Schedule

• Districtwide Roundabout Program	2019
• Preliminary Engineering	Fall 2021 – current
• Coordination with Lower Merion Township	Fall 2021 and ongoing
• PennDOT CONNECTS meeting	Summer 2021
• Lower Merion Twp Lunch n Learn with Sutton Terrace	Spring 2022
• PennDOT Public Meeting	Spring 2024
• Final Design	Fall 2024 (approx.)
• Construction Start	Spring 2027 (approx.)



# PROJECT OVERVIEW

Turning Movement Counts (TMC)																																			
2024 AM		2024 PM																																	
<b>Belmont Ave (SR 3045)</b>																																			
St. Asaphs Road	<table border="1"> <tr><td>64</td><td>375</td><td>87</td><td>143</td></tr> <tr><td>48</td><td></td><td></td><td>725</td></tr> <tr><td>465</td><td></td><td></td><td>24</td></tr> <tr><td>34</td><td></td><td></td><td></td></tr> </table>	64	375	87	143	48			725	465			24	34				<table border="1"> <tr><td>54</td><td>309</td><td>37</td><td>200</td></tr> <tr><td>41</td><td></td><td></td><td>889</td></tr> <tr><td>499</td><td></td><td></td><td>105</td></tr> <tr><td>42</td><td></td><td></td><td></td></tr> </table>	54	309	37	200	41			889	499			105	42				Belmont Ave (SR 3045)
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Note: 2021 TMC grown to 2024 using 0.33% PennDOT growth rate



 Proposed Lower Merion Township Rectangular Rapid Flashing Beacon (RRFB) NOT CONSTRUCTED YET  
 Existing Traffic Signal



# PROJECT OVERVIEW

## Lower Merion Township Zoning Code

Did you know that Lower Merion Township Adopted a New Zoning Code on February 26, 2020?

Callers Hall  
May 1, 2022



- Public Gathering Space
- Linear Public Gathering Space
- Open Space
- Proposed Road
- Public Multi-Purpose Path
- Potential Connection outside City Avenue District

Project Location

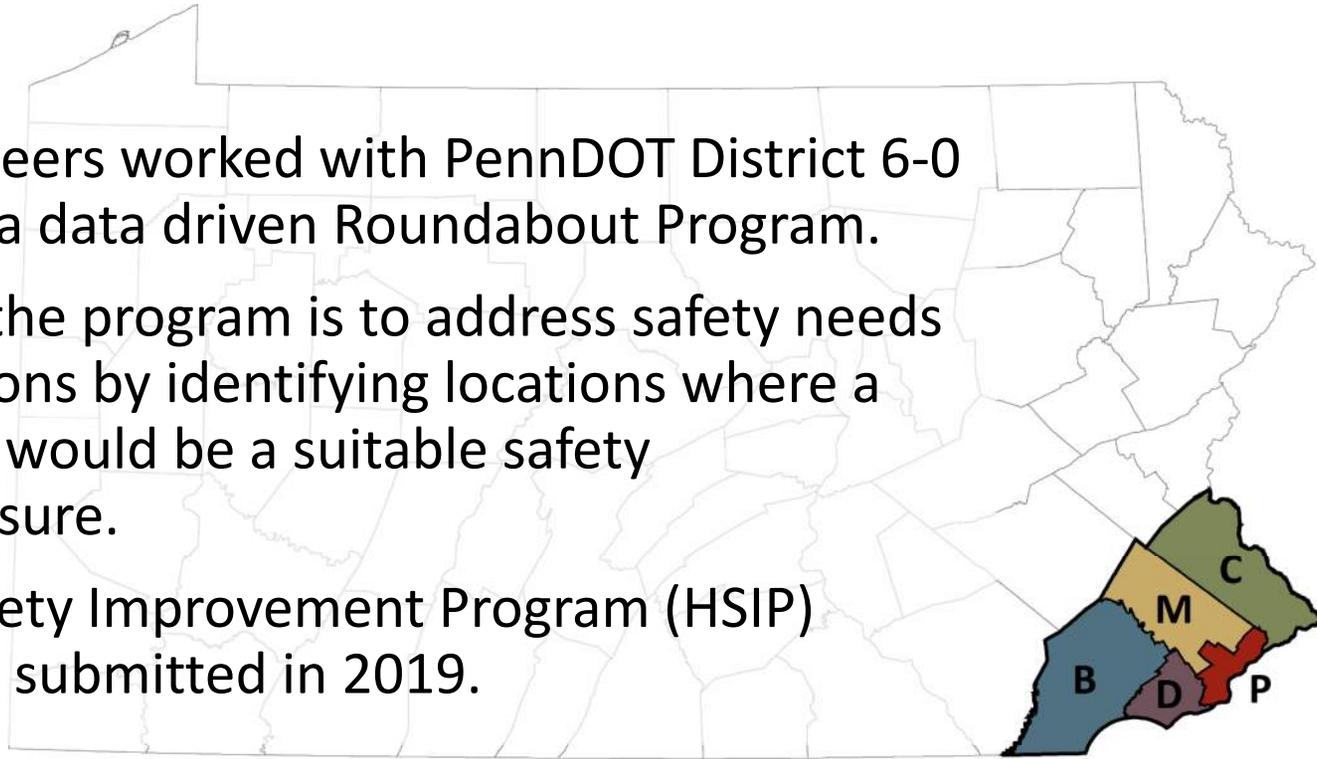
Mainline Greenway Map

Project Location



# DISTRICTWIDE ROUNDABOUT PROGRAM

- Urban Engineers worked with PennDOT District 6-0 to establish a data driven Roundabout Program.
- The goal of the program is to address safety needs at intersections by identifying locations where a roundabout would be a suitable safety countermeasure.
- Highway Safety Improvement Program (HSIP) Applications submitted in 2019.



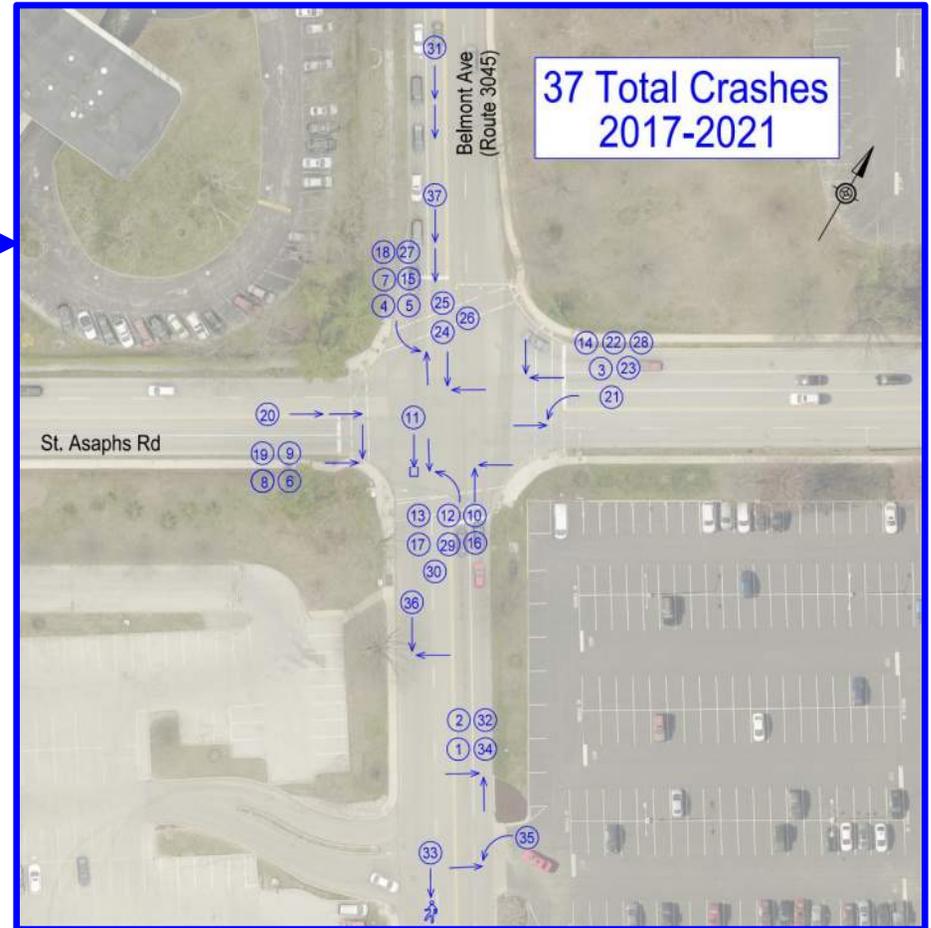
**DISTRICT 6-0**



# PURPOSE

- The intersection has a history of severe crashes.
  - 53% of reported crashes had suspected serious, minor or possible injury.
- The intersection has a history of angle crashes.
  - 88% of reported crashes were angle crashes.
  - 91% of reported crashes had no weather or environmental factors.

- Reduce the number and severity of potential crashes at the intersection.
- Improve pedestrian connections and accommodate redevelopment in three of the four quadrants.

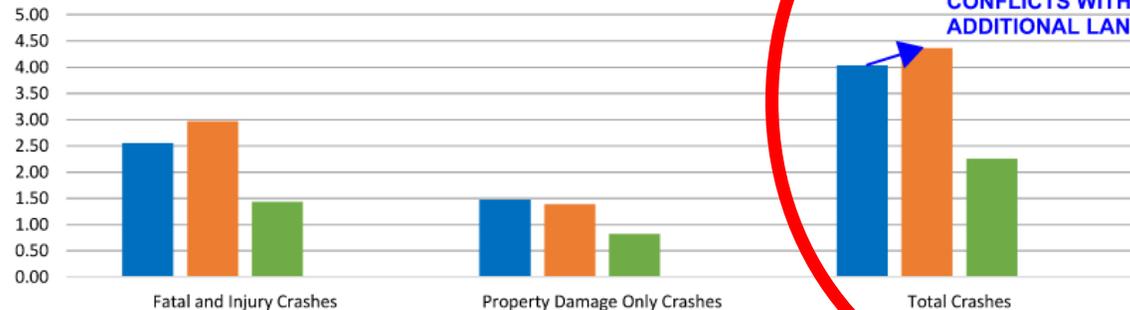


# HIGHWAY SAFETY MANUAL (HSM) ANALYSIS

- Federal HSIP funding requires benefit/cost analysis to secure construction funding.
- Traffic signal alternative **increases** crashes.
- Does not address pedestrian crossing concerns.
  - Crossing distances would be increased to include additional lane for left turning vehicles.



Summary of Predicted Crash Performance - Alternative Analysis



Source: PennDOT Highway Safety Manual (HSM) Tool R



# WHY A ROUNDABOUT?

- Address PennDOT's Strategic Highway Safety Plan (SHSP).
- Roundabouts are an FHWA Proven Safety Countermeasure.

## Safety Statistics

In September 2023, PennDOT released data for 42 roundabouts on state routes at intersections that were previously stop- or signal-controlled. These roundabouts were reviewed based on having at least three years of data available before and after the roundabout's installation. These 42 comprise all the roundabouts on state routes that met the review parameters. Department data based on police-submitted crash reports spanning the years 2003 through 2022 shows:

- Crashes involving suspected serious injuries were reduced by 24 percent;
- Crashes involving suspected non-serious injuries were reduced by 51 percent;
- and
- The total number of crashes dropped three percent.

In addition to the 42 roundabouts meeting the review criteria, 36 other roundabouts have been installed on state routes.

*Source: PennDOT Roundabout Website*



# WHY A ROUNDABOUT?

## Roundabout Operation Characteristics

Roundabouts		Traffic Circles
<p><b>Yield-at-Entry Rule:</b></p> <ul style="list-style-type: none"> <li>• Entering traffic yields to circulating traffic, which always keeps moving.</li> <li>• Very efficient with heavy traffic.</li> <li>• No weaving distance is needed, so roundabouts are small and fit in compact spaces.</li> </ul>	<p><b>YIELD</b></p> 	<p><b>Entering traffic may interfere with circulating traffic:</b></p> <ul style="list-style-type: none"> <li>• Circulating traffic can not clear when entering traffic fills circle.</li> <li>• Heavy traffic causes gridlock.</li> <li>• Circles must be large to provide long weaving distances.</li> </ul>
<p><b>Entering traffic is deflected slowly around the central island:</b></p> <ul style="list-style-type: none"> <li>• Deflection controls speed without enforcement, thereby reducing accidents.</li> <li>• Deflection forms gaps in traffic so other vehicles can enter.</li> <li>• Entry flare adds lanes</li> </ul>	<p><b>DEFLECTION</b></p> 	<p><b>Inconsistent entry design may allow traffic to enter at high speed:</b></p> <ul style="list-style-type: none"> <li>• Serious accidents can result on high speed streets.</li> <li>• Fast entries impede gap acceptance and defeat the yielding process.</li> </ul>
<p><b>Flare increases capacity at the intersection, where capacity is needed most:</b></p> <ul style="list-style-type: none"> <li>• Flare promotes narrow streets between roundabouts, saving cost and neighborhood impacts.</li> </ul>	<p><b>FLARE</b></p> 	<p><b>Poor entry conditions may not benefit from flare:</b></p> <ul style="list-style-type: none"> <li>• Poor intersection capacity even with large traffic circles.</li> <li>• Higher capacity requires wide streets between circles, wasting money and land</li> </ul>



# ROUNDAABOUT BENEFITS

## Benefits of Roundabouts

- Improve safety
- Slower vehicle speeds
- Efficient traffic flow
- Reduces pollution and fuel use
- Traffic calming
- Gateway opportunity

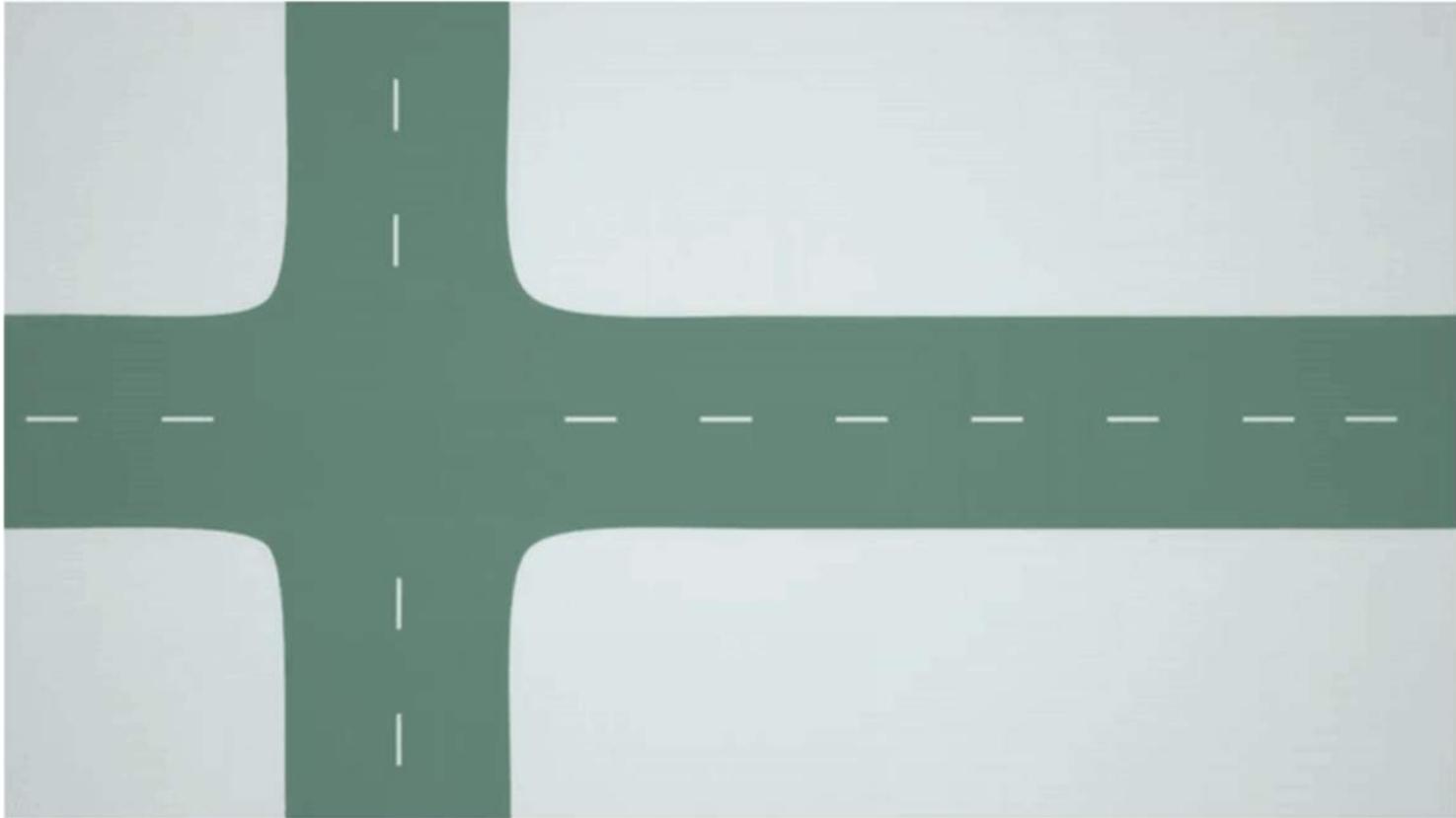


Source: Vision ZERO



# ROUNDBABOUTS

## Vehicular Conflicts at Intersections



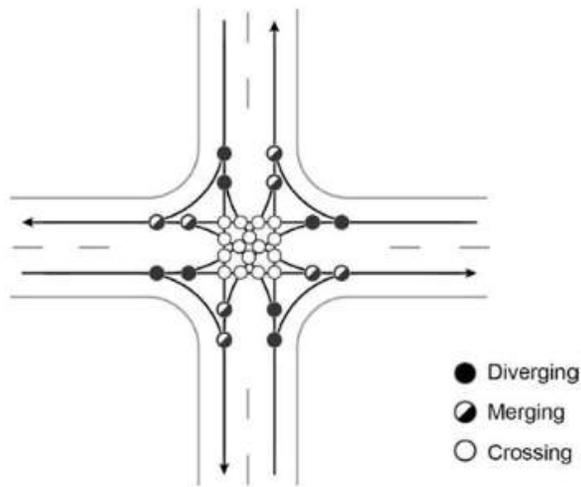
*Source: Utah Department of Transportation*



# ROUNDBABOUTS

## Vehicular Conflicts at Intersections

Exhibit 7.2. Conflict point diagram for signalized or stop-controlled intersections.

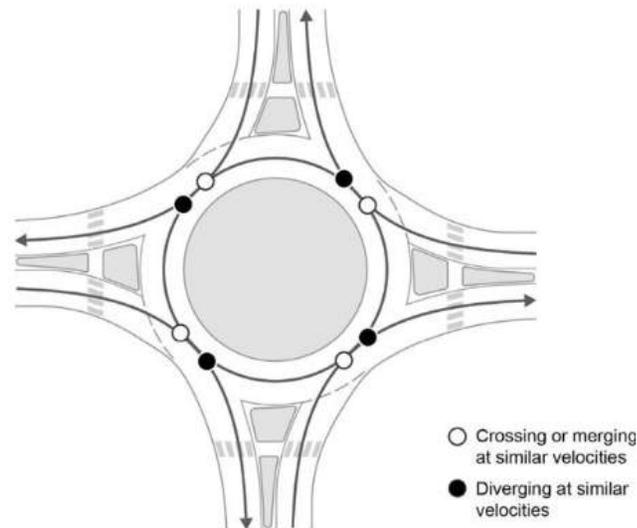


Source: NCHRP Report 1043: Guide for Roundabouts, 2023

Traditional Intersection

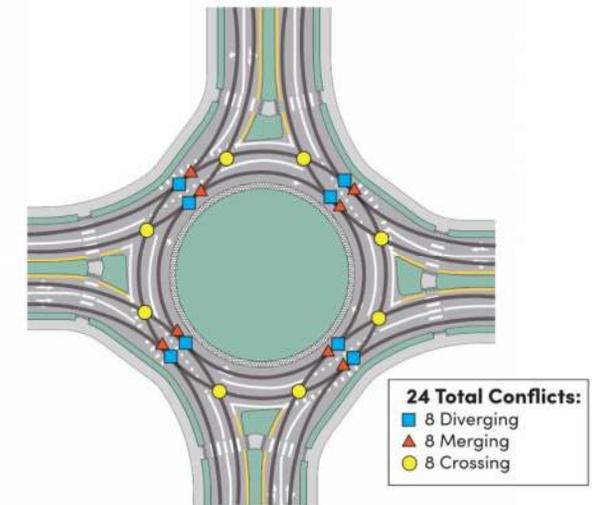
**32 Conflict Points**

Exhibit 7.3. Conflict point diagram for single-lane roundabouts.



Roundabout

**8 Conflict Points**



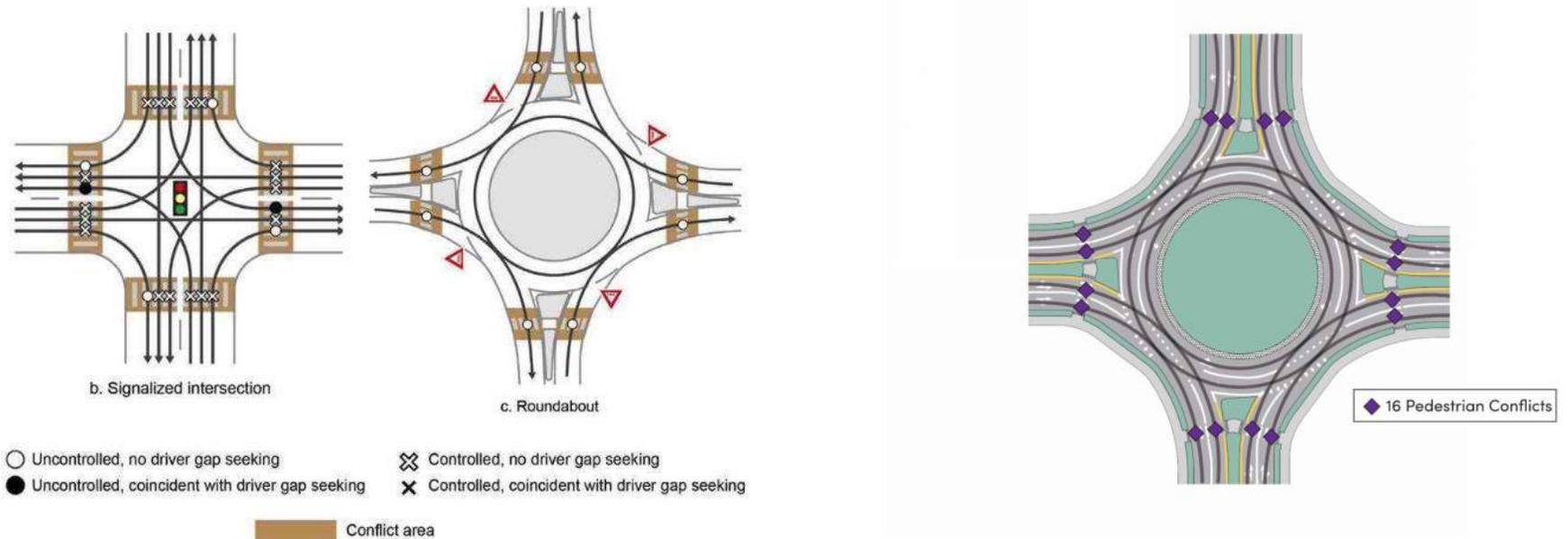
Roundabout (2 lane)

**24 Conflict Points**



# ROUNDBABOUTS & PEDESTRIANS

## Pedestrian Conflicts at Intersections



Source: NCHRP Report 1043: Guide for Roundabouts, 2023

Traditional Intersection

**32 Conflict Points**

Roundabout

**8 Conflict Points**

Roundabout (2 lane)

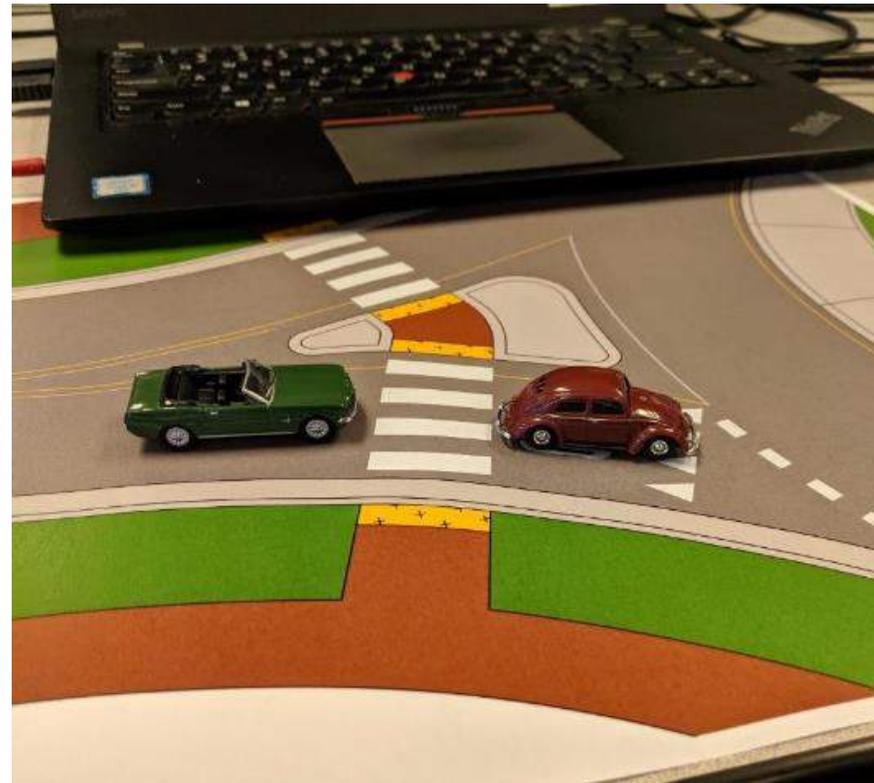
**16 Conflict Points**



# ROUNDAABOUTS & PEDESTRIANS

## Pedestrian Crossings at Roundabouts

- Crosswalks set back one car length
- Separates conflicts between cars and pedestrians
- Allows pedestrians to cross when cars are queued



Source: *Urban Engineers*



# ROUNDAABOUTS & PEDESTRIANS

## Rectangular Rapid Flashing Beacons (RRFBs) - Examples



Presidential Boulevard



Ardmore - Lancaster Avenue

**Safety Benefits:**

RRFBs can reduce crashes up to:

**47%**

for pedestrian crashes.

RRFBs can increase motorist yielding rates up to:

**98%**

varies by speed limit, number of lanes, crossing distance, and time of day.<sup>4</sup>

Source: FHWA

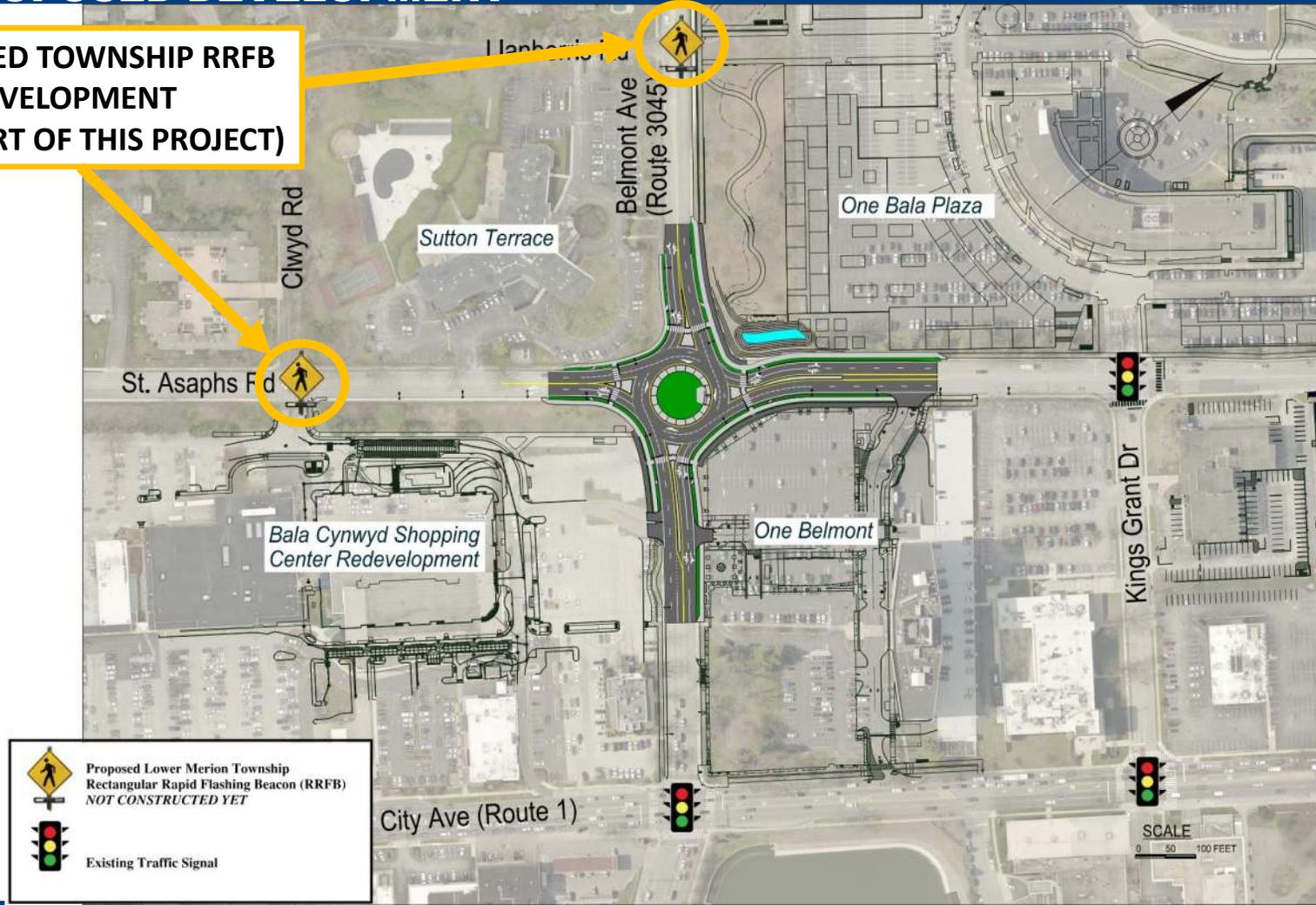


# PROPOSED DESIGN

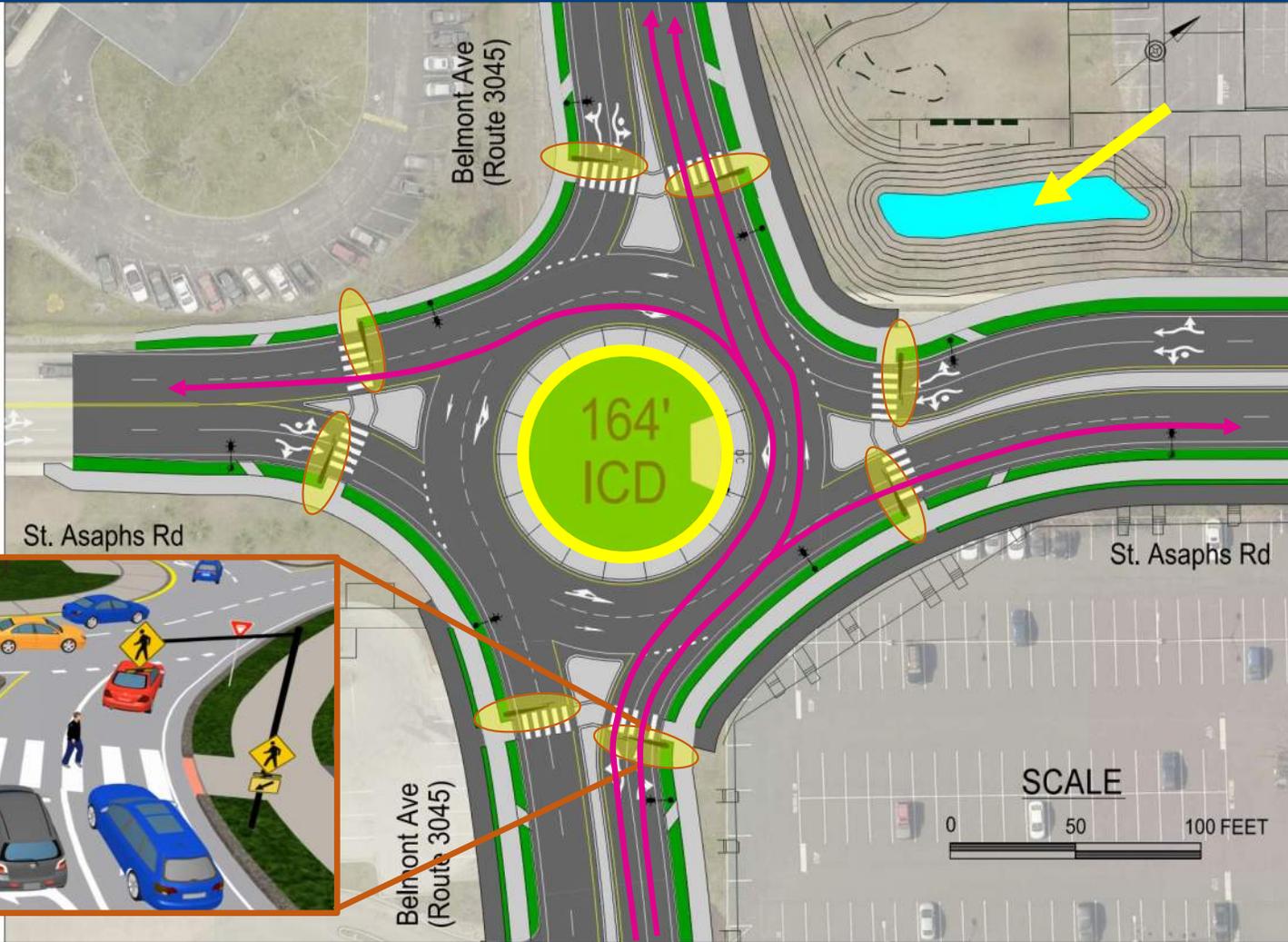


# PROPOSED DESIGN → WITH PROPOSED DEVELOPMENT

**PROPOSED TOWNSHIP RRFB  
THRU DEVELOPMENT  
(NOT PART OF THIS PROJECT)**



# PROPOSED DESIGN

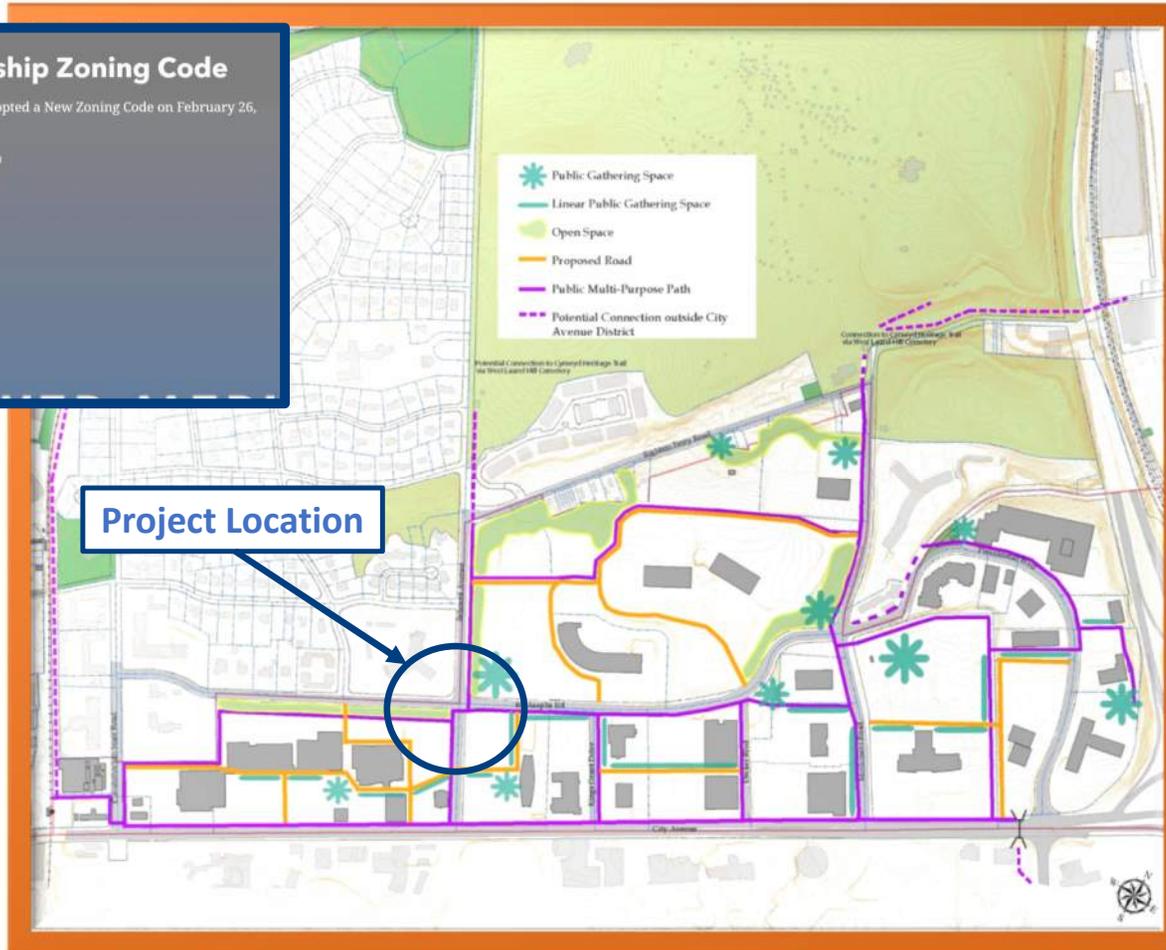
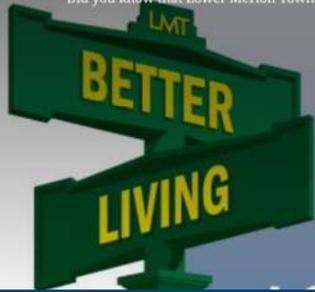


# MULTI PURPOSE PATH

## Lower Merion Township Zoning Code

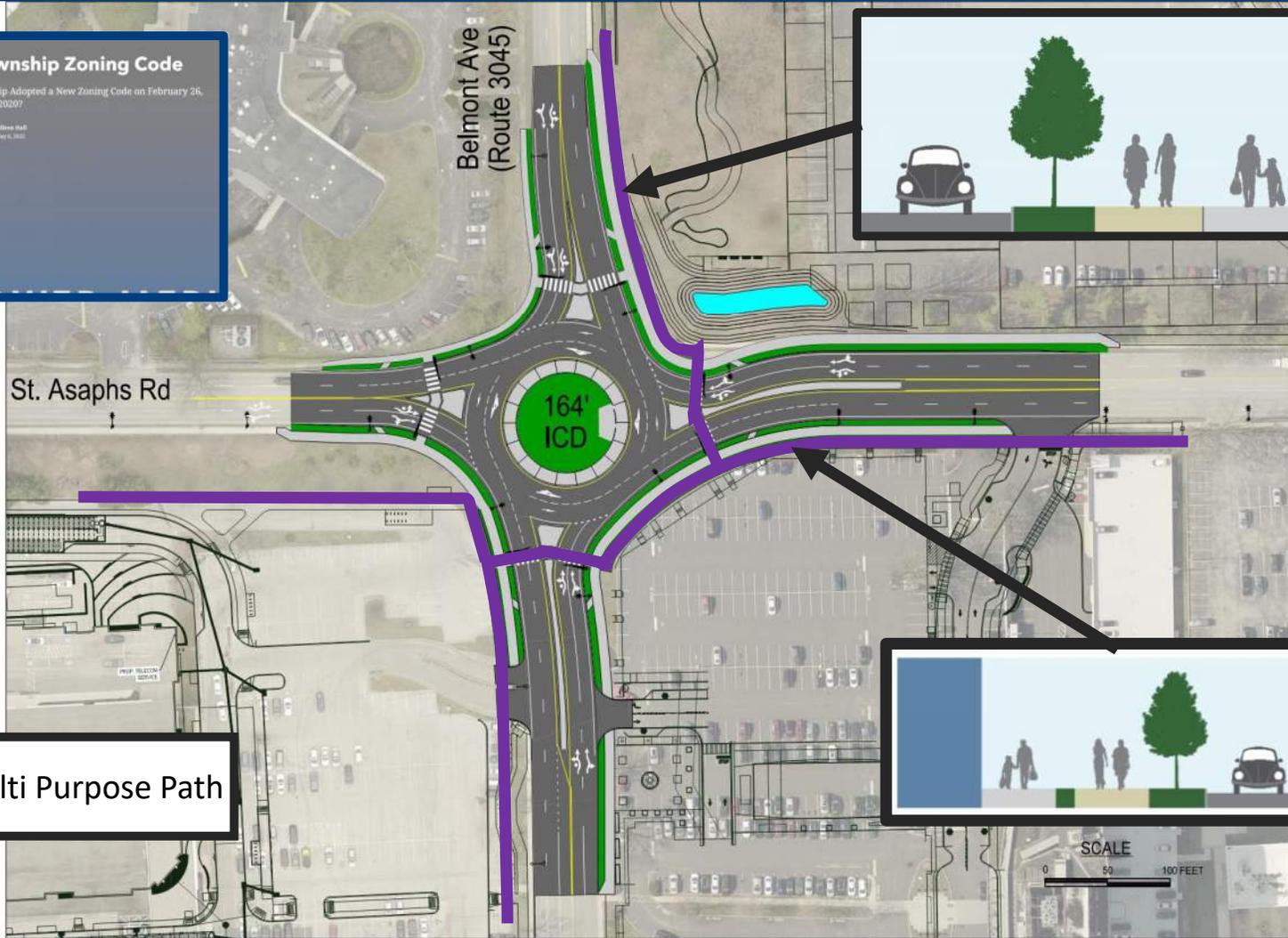
Did you know that Lower Merion Township Adopted a New Zoning Code on February 26, 2020?

Callison Hall  
May 6, 2022



# PROPOSED DESIGN

**Lower Merion Township Zoning Code**  
Did you know that Lower Merion Township Adopted a New Zoning Code on February 26, 2020?  
Cullman Hall  
May 6, 2022

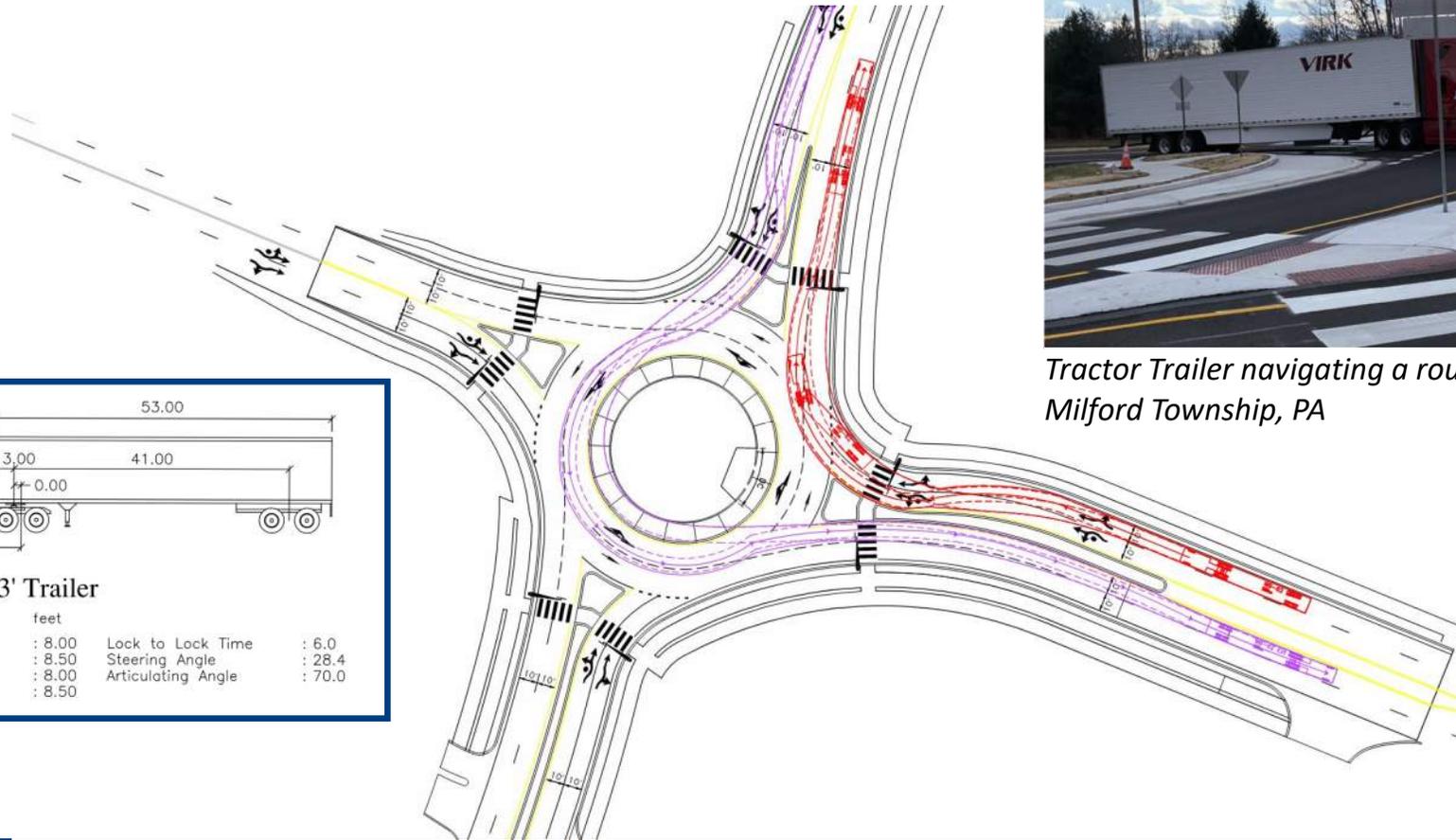
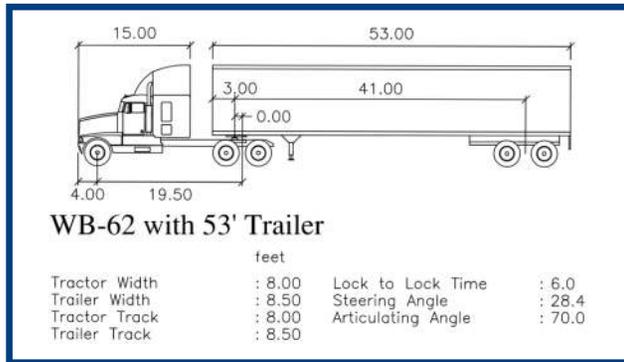


# INTERSECTION LIGHTING



# OPERATIONS

## Large Vehicles Accommodations

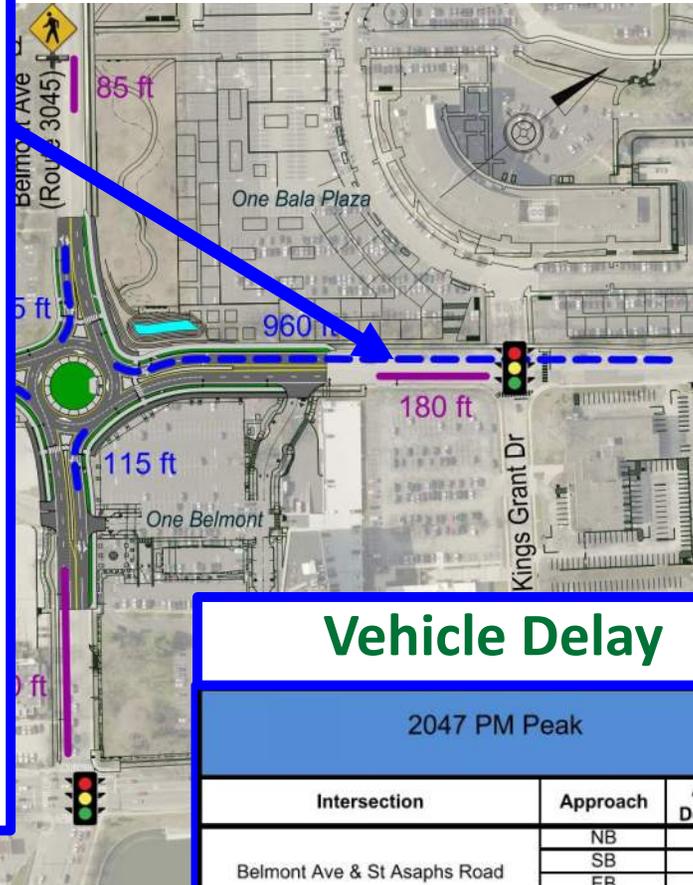
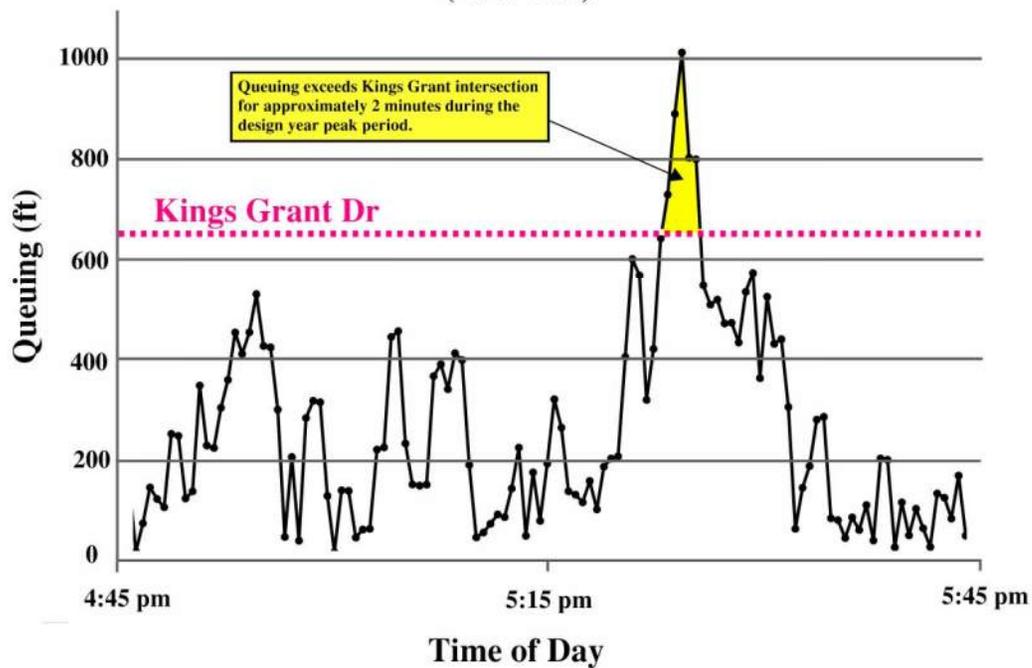


*Tractor Trailer navigating a roundabout in Milford Township, PA*



# OPERATIONS (QUEUEING)

St Asaphs Road WB Queuing  
(2047 PM)



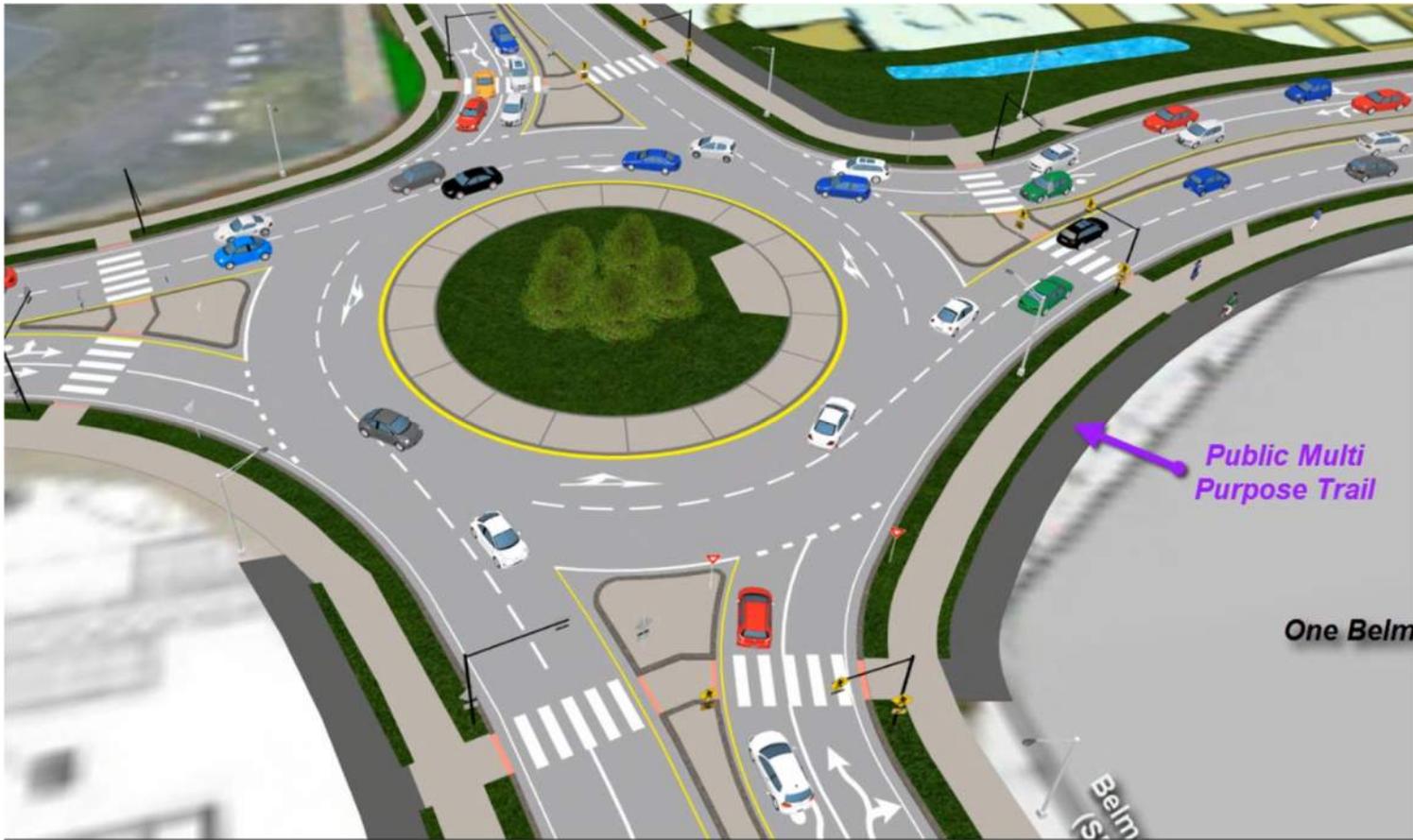
## Vehicle Delay

2047 PM Peak

Intersection	Approach	Average Delay (sec)
Belmont Ave & St Asaphs Road	NB	5
	SB	18
	EB	9
	WB	38



# TRAFFIC SIMULATION



# ROUNDBABOUT EXAMPLES



Source: Google

Location: Philadelphia Pennsylvania – “Walnut Lane Roundabout”



# ROUNDAABOUT EXAMPLES



Source: Google

Location: Vernon Township Pennsylvania – “The Big I Roundabout”



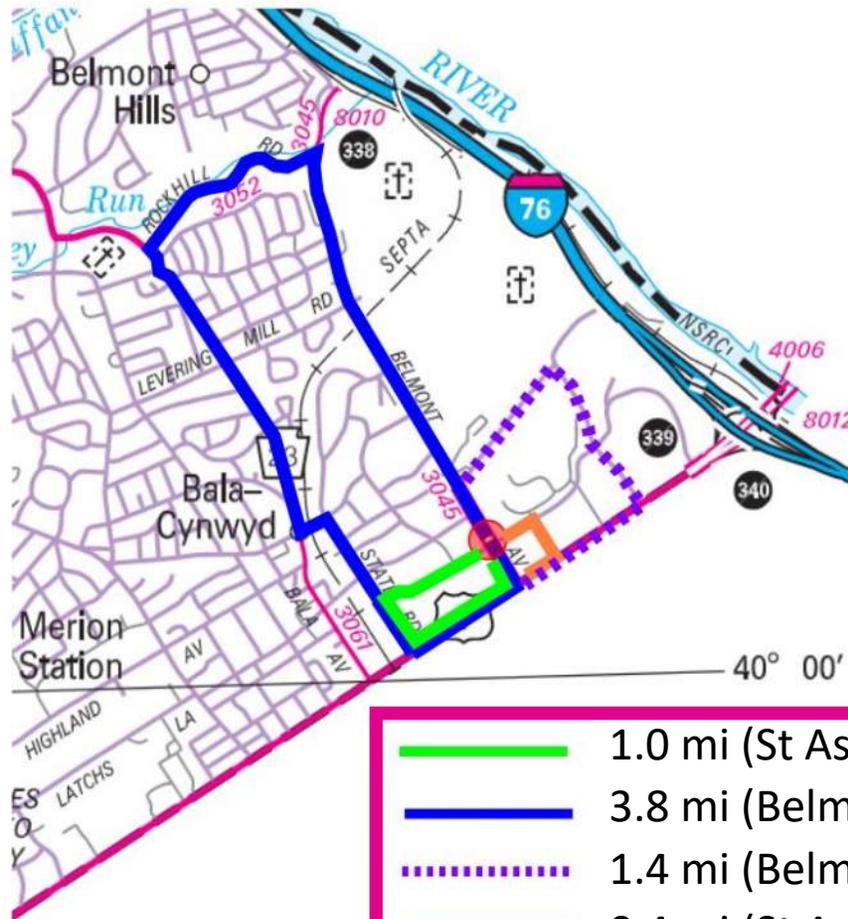
# ROUNDAABOUT EXAMPLES



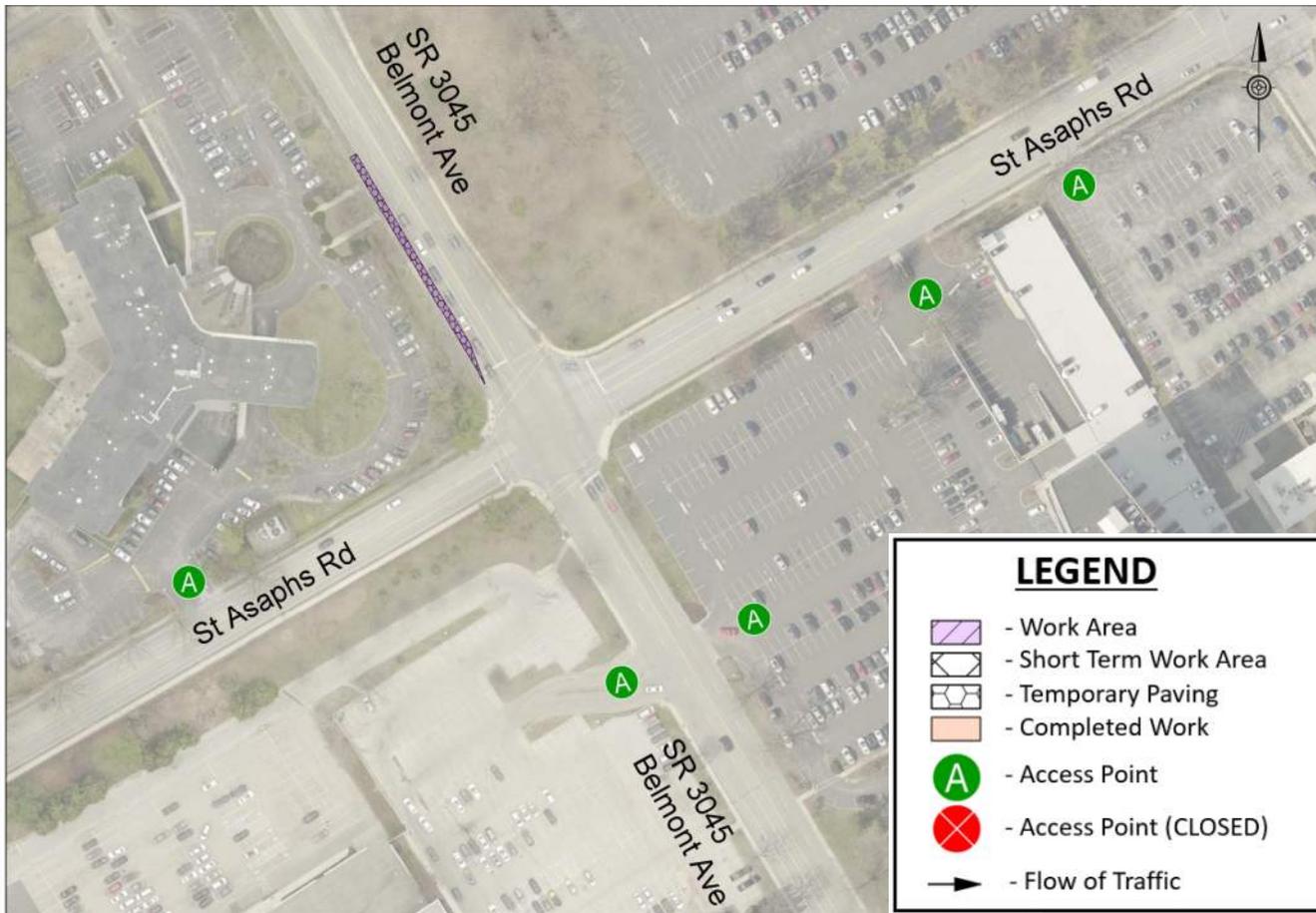
Source: Google  
Location: Malta, New York



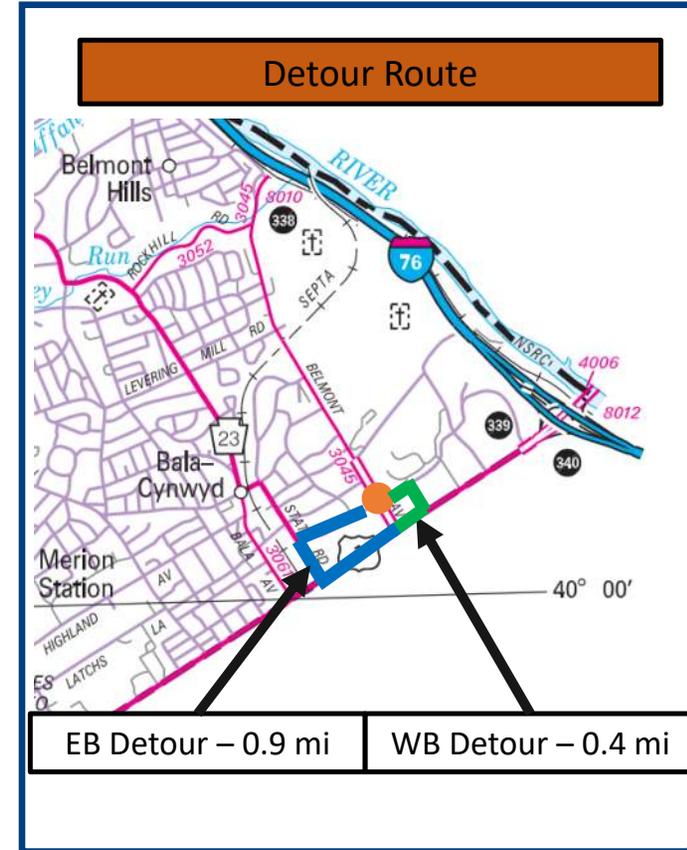
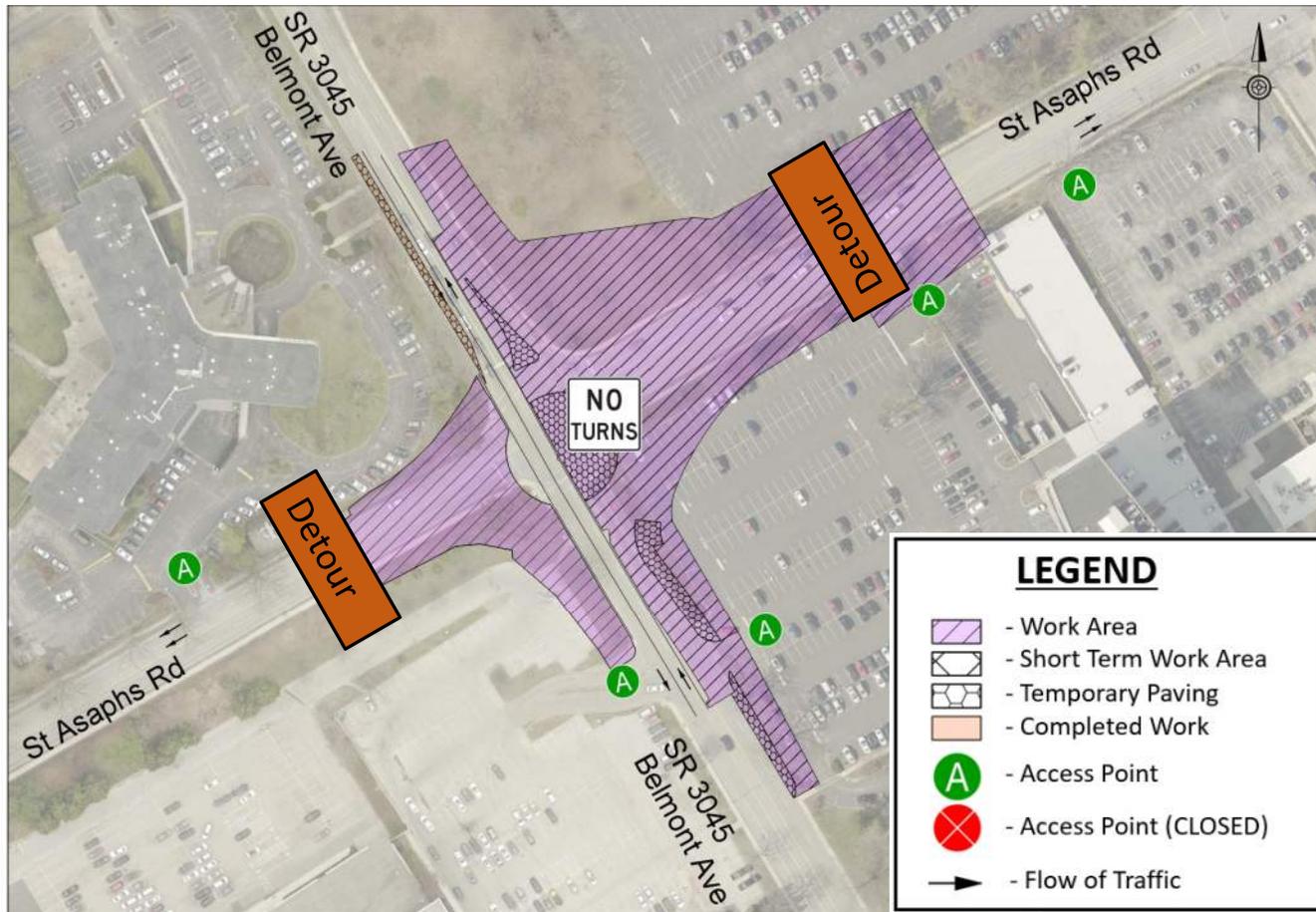
# CONSTRUCTION – FULL DETOUR OPTION



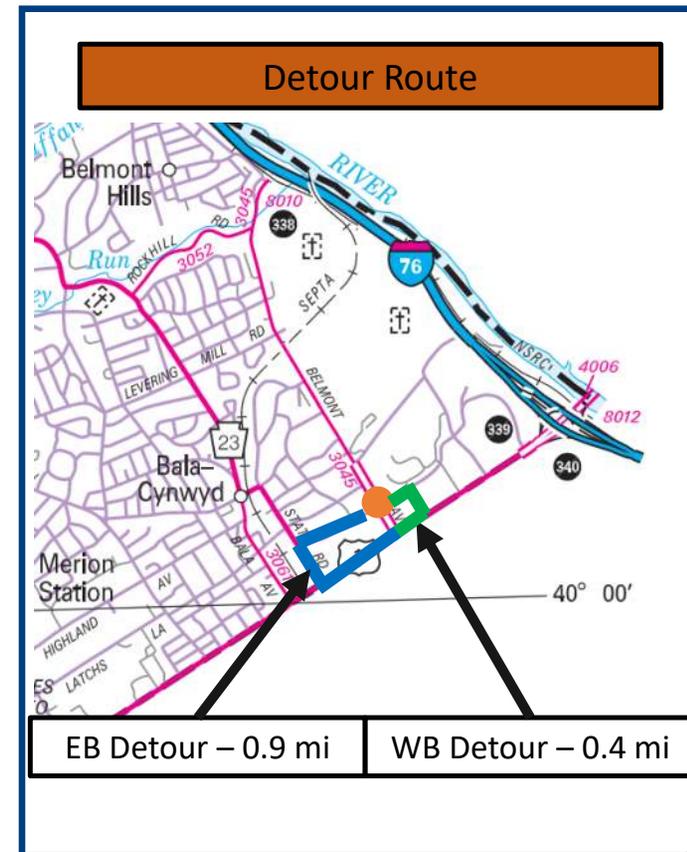
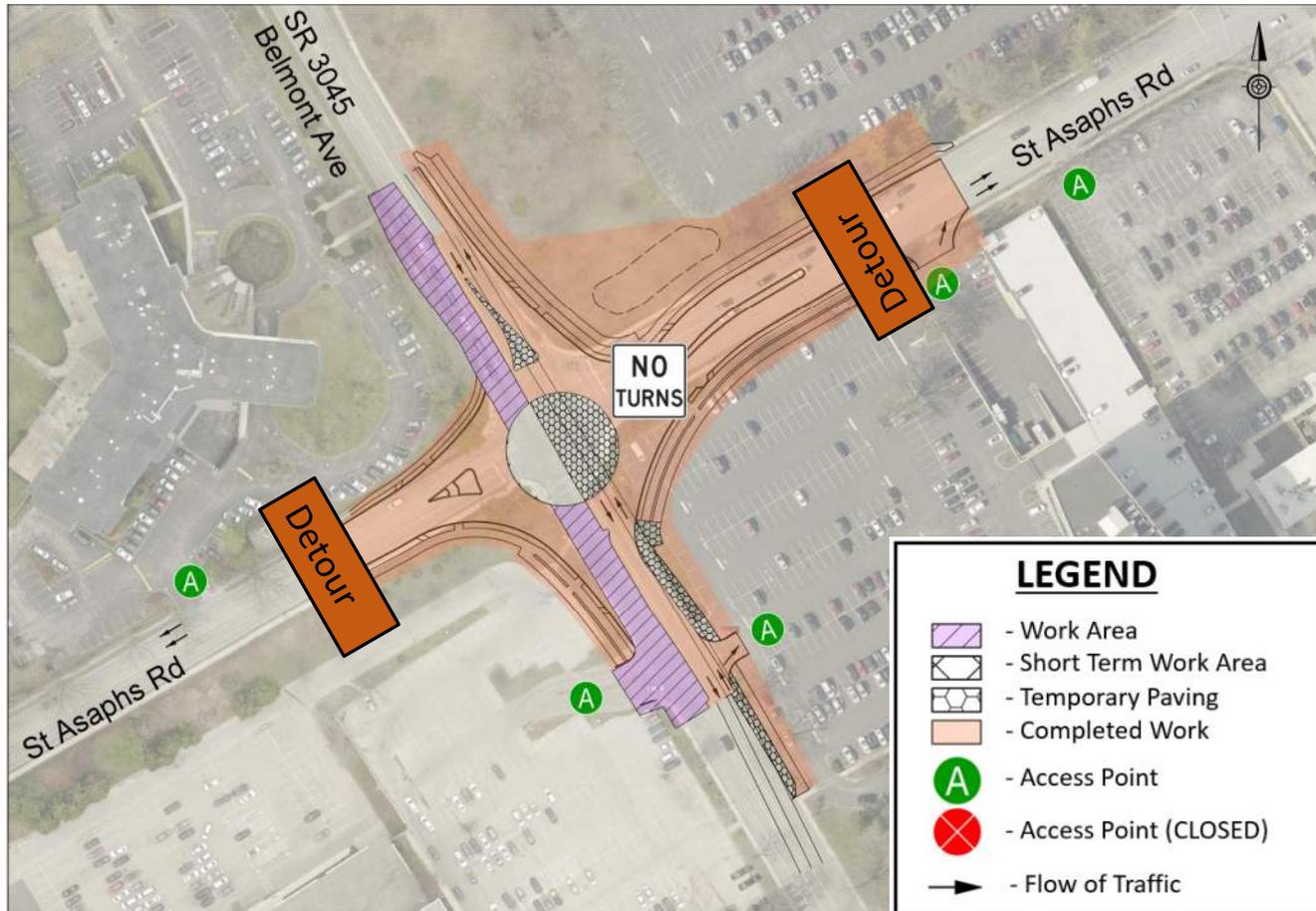
# CONSTRUCTION - STAGE 1



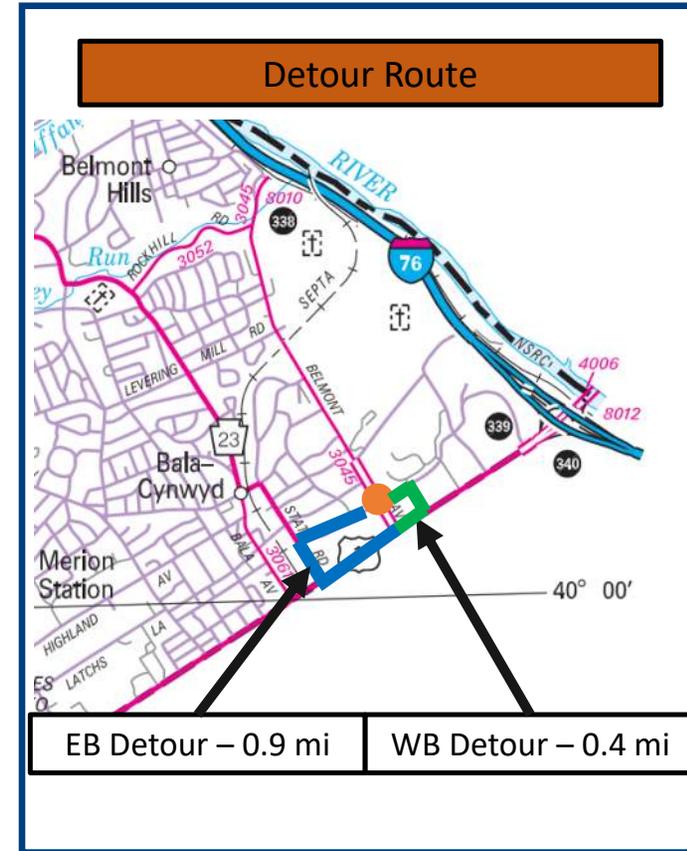
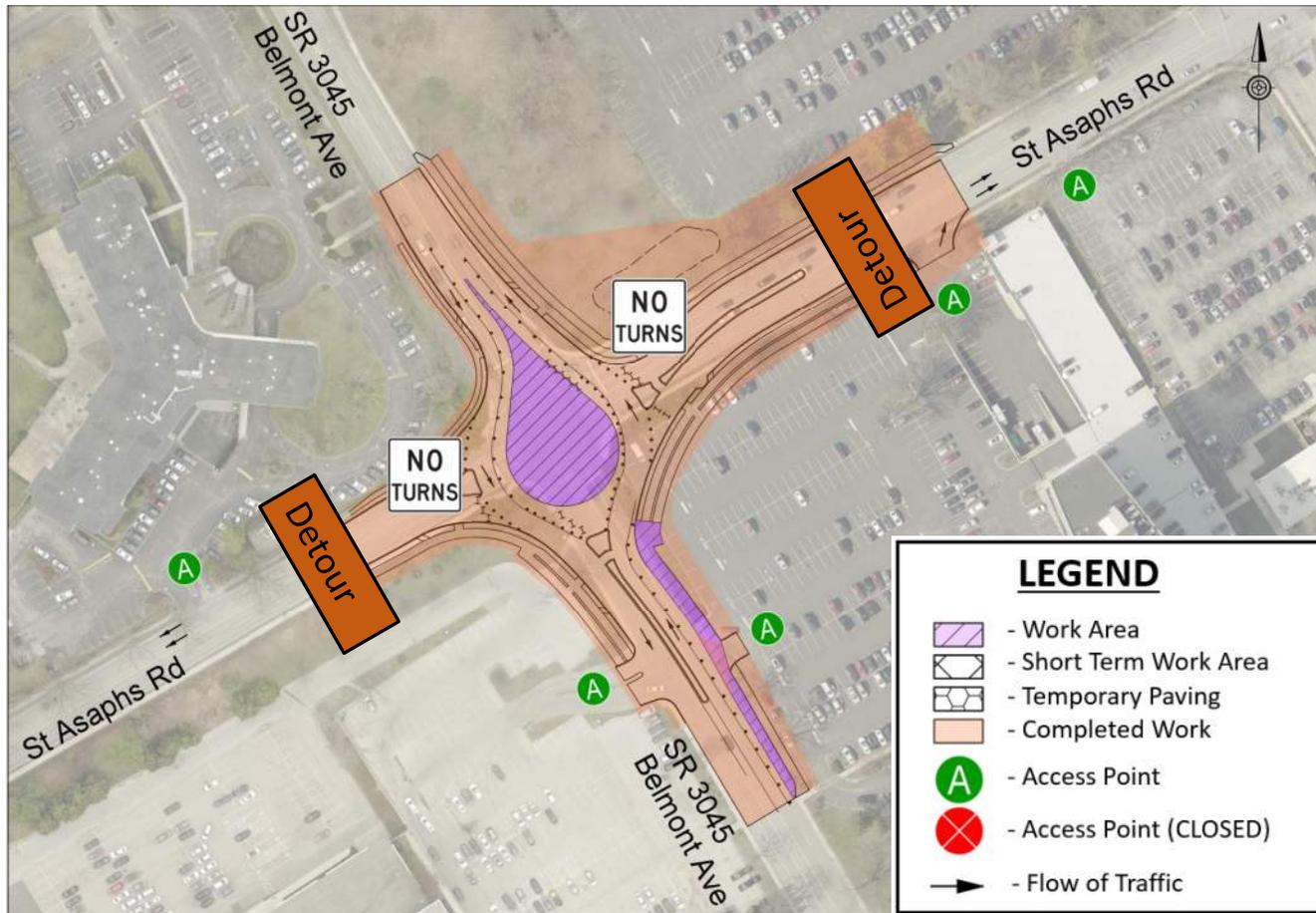
# CONSTRUCTION - STAGE 2



# CONSTRUCTION - STAGE 3

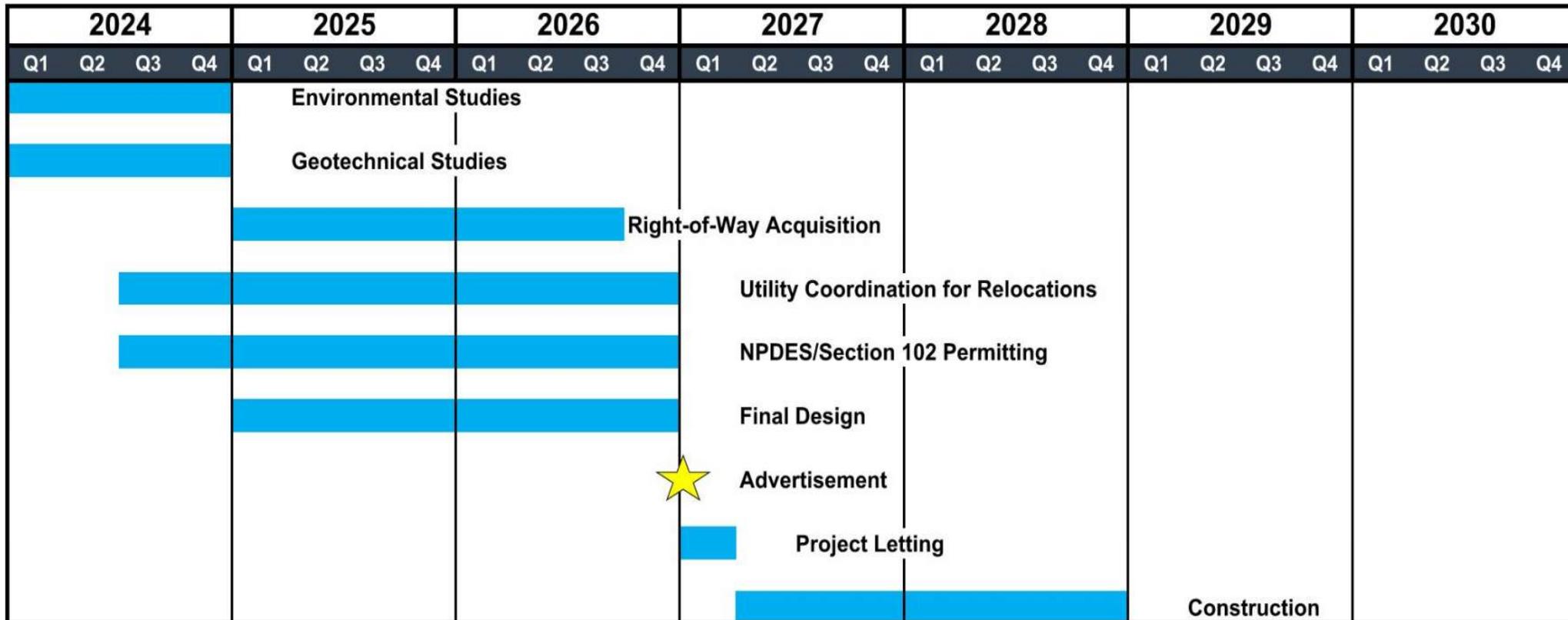


# CONSTRUCTION - STAGE 4



# PROJECT TIMELINE OVERVIEW

## Upcoming Activities



# QUESTIONS?

# THANK YOU

## Contact Information

Consultant Project Manager, Nathan Parrish, P.E.

c-nparrish@pa.gov

## For more information about roundabouts:

<https://www.penndot.pa.gov/ProjectAndPrograms/RoadDesignEnvironment/RoadDesign/Pages/Roundabouts.aspx>

## To comment, visit:

<https://www.penndot.pa.gov/RegionalOffices/district-6/ConstructionsProjectsAndRoadwork/MontgomeryCounty/Pages/Belmont-Avenue-and-St-Asaphs-Road-Roundabout.aspx>

MARCH 27, 2024