

WELCOME

U.S. 202 (Buckingham Rd) and York Rd Roundabout
Intersection Improvement Project
Public Meeting

MAY 21, 2024

INTRODUCTIONS



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



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

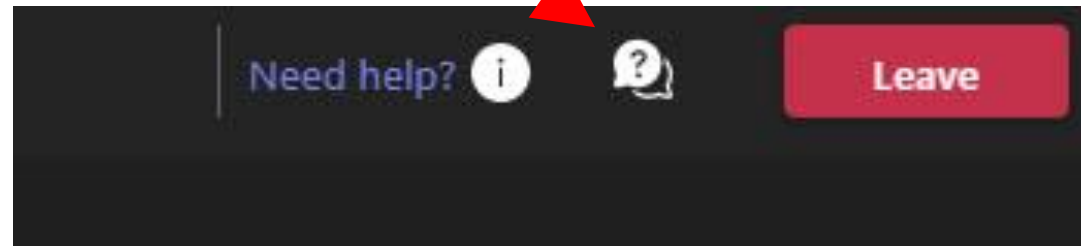


- Andrew Gould, P.E., Project Engineer



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

Purpose & Project Selection

Highway Safety Manual (HSM) Analysis

Roundabout Education

Proposed Design

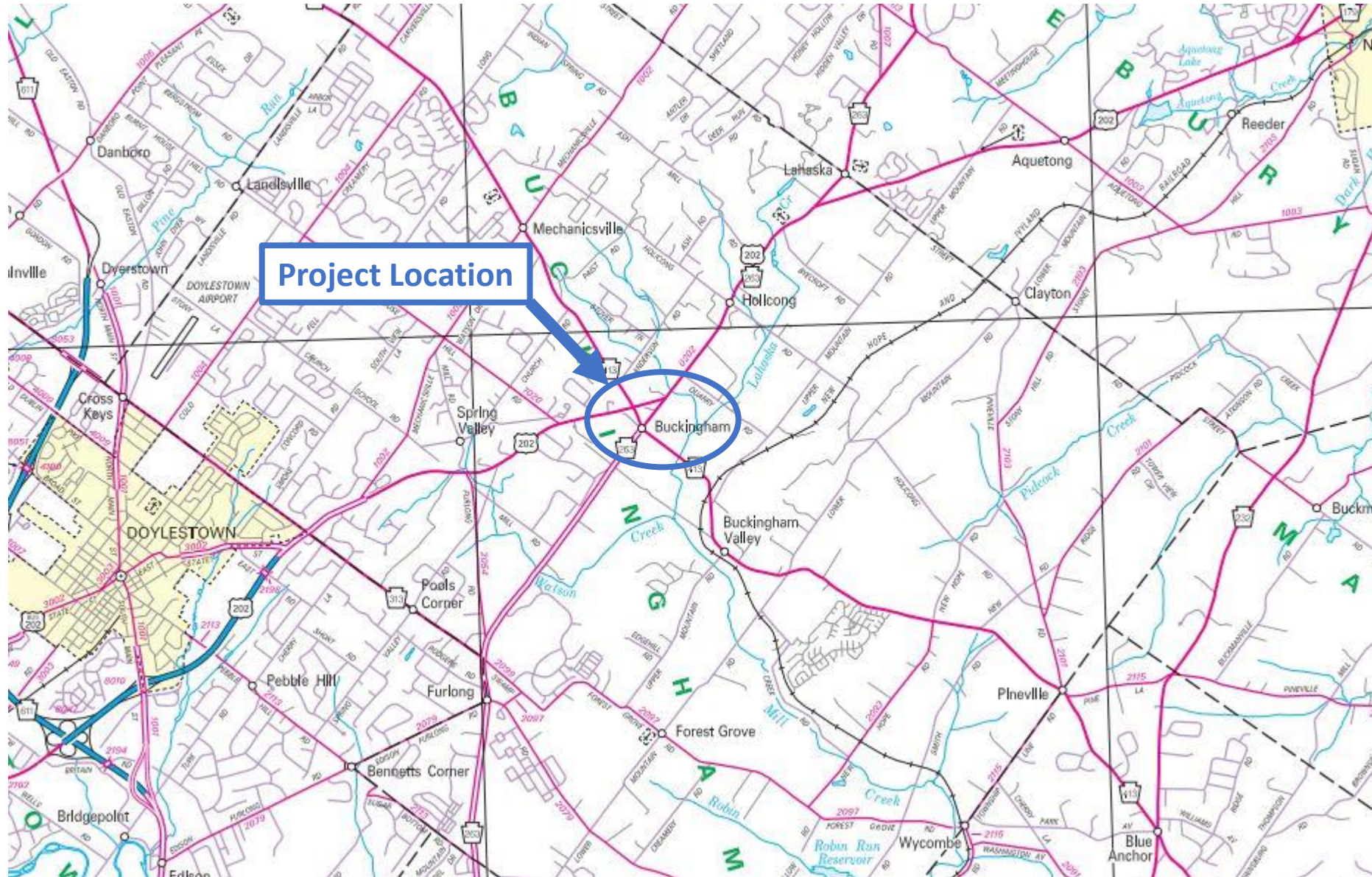
Operations and Safety Considerations

Construction Staging & Next steps

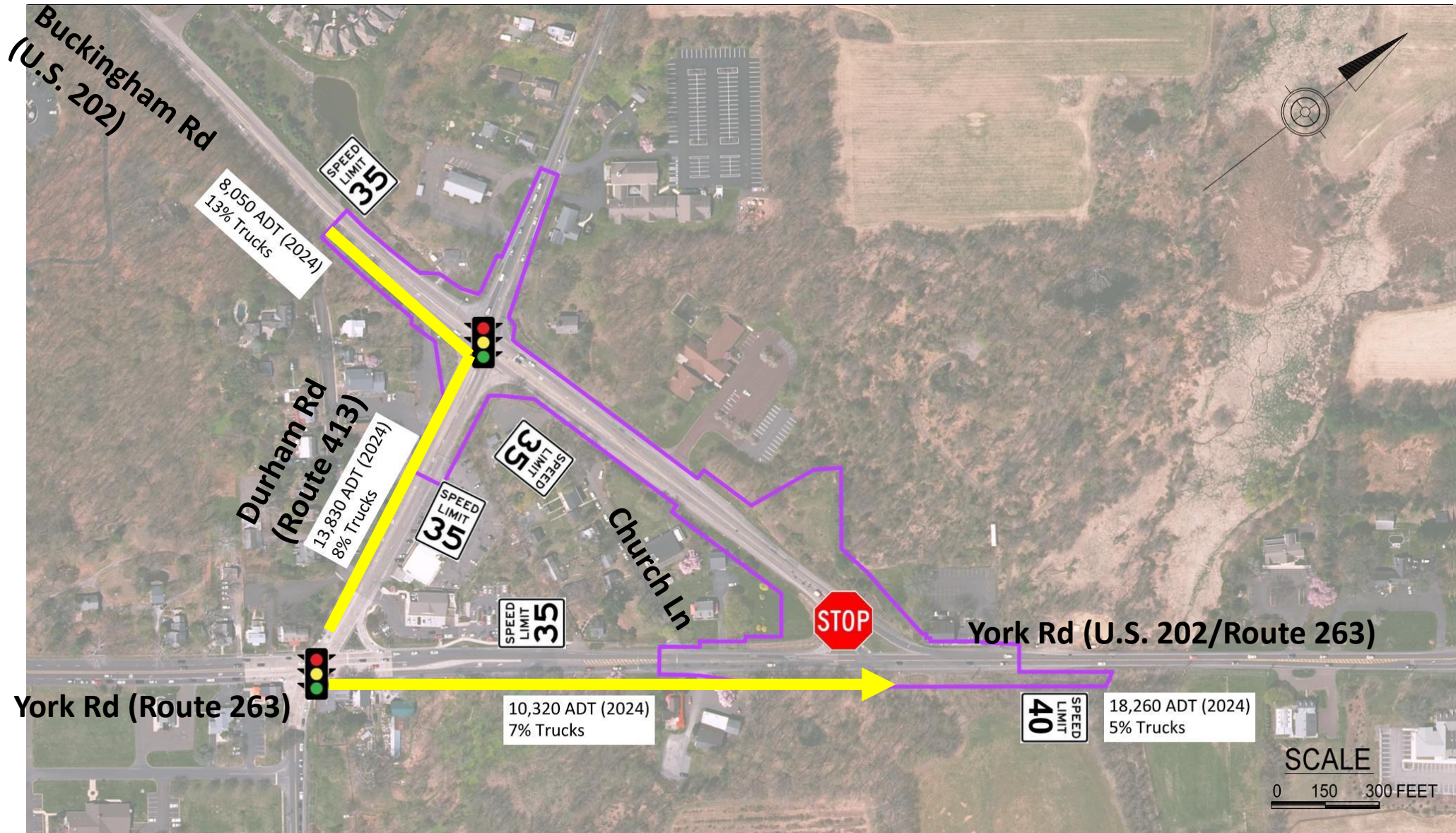
Questions and Answers



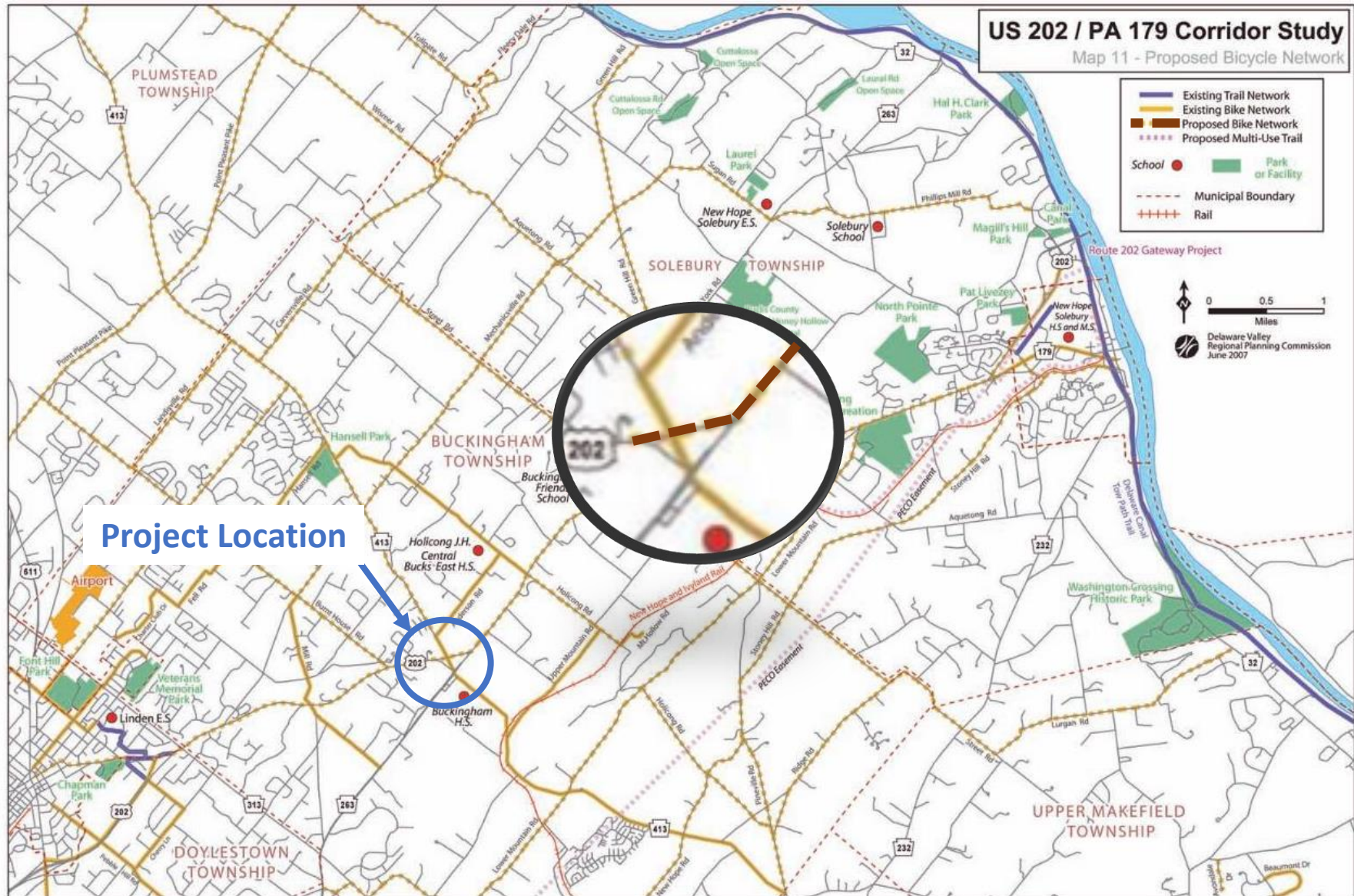
PROJECT OVERVIEW



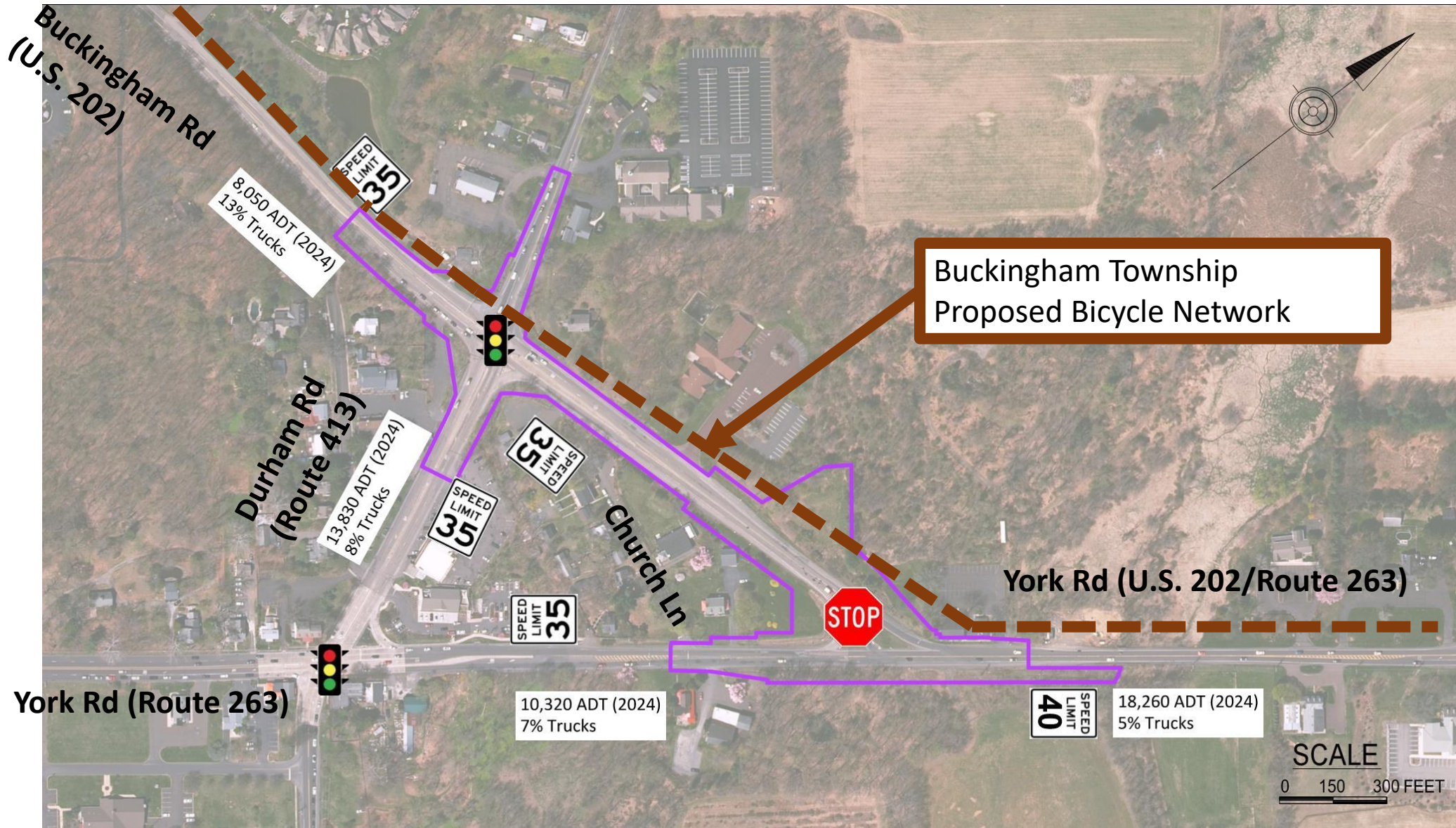
PROJECT OVERVIEW



PROJECT OVERVIEW



PROJECT OVERVIEW



ENVIRONMENTAL OVERVIEW

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | |
|------------------------------------|---|
| SPECIAL FLOOD HAZARD AREAS | <ul style="list-style-type: none"> Without Base Flood Elevation (BFE) Zone A, V, AE, AR With BFE or Depth Zone AE, AD, AH, VE, AR Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | <ul style="list-style-type: none"> 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X Future Conditions 1% Annual Chance Flood Hazard Zone X Area with Reduced Flood Risk due to Levee. See Notes, Zone X Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | <ul style="list-style-type: none"> Area of Minimal Flood Hazard Zone X Effective LOMRs Area of Undetermined Flood Hazard Zone D |
| GENERAL STRUCTURES | <ul style="list-style-type: none"> Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall |
| OTHER FEATURES | <ul style="list-style-type: none"> Cross Sections with 1% Annual Chance Water Surface Elevation Coastal Transect Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary Coastal Transect Baseline Profile Baseline Hydrographic Feature |
| MAP PANELS | <ul style="list-style-type: none"> Digital Data Available No Digital Data Available Unmapped <p>The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.</p> |

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/1/2024 at 12:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Buckingham Village
Historic District – NR
Boundary

Project Area

York Rd (U.S. 202/Route 263)

wetland 1

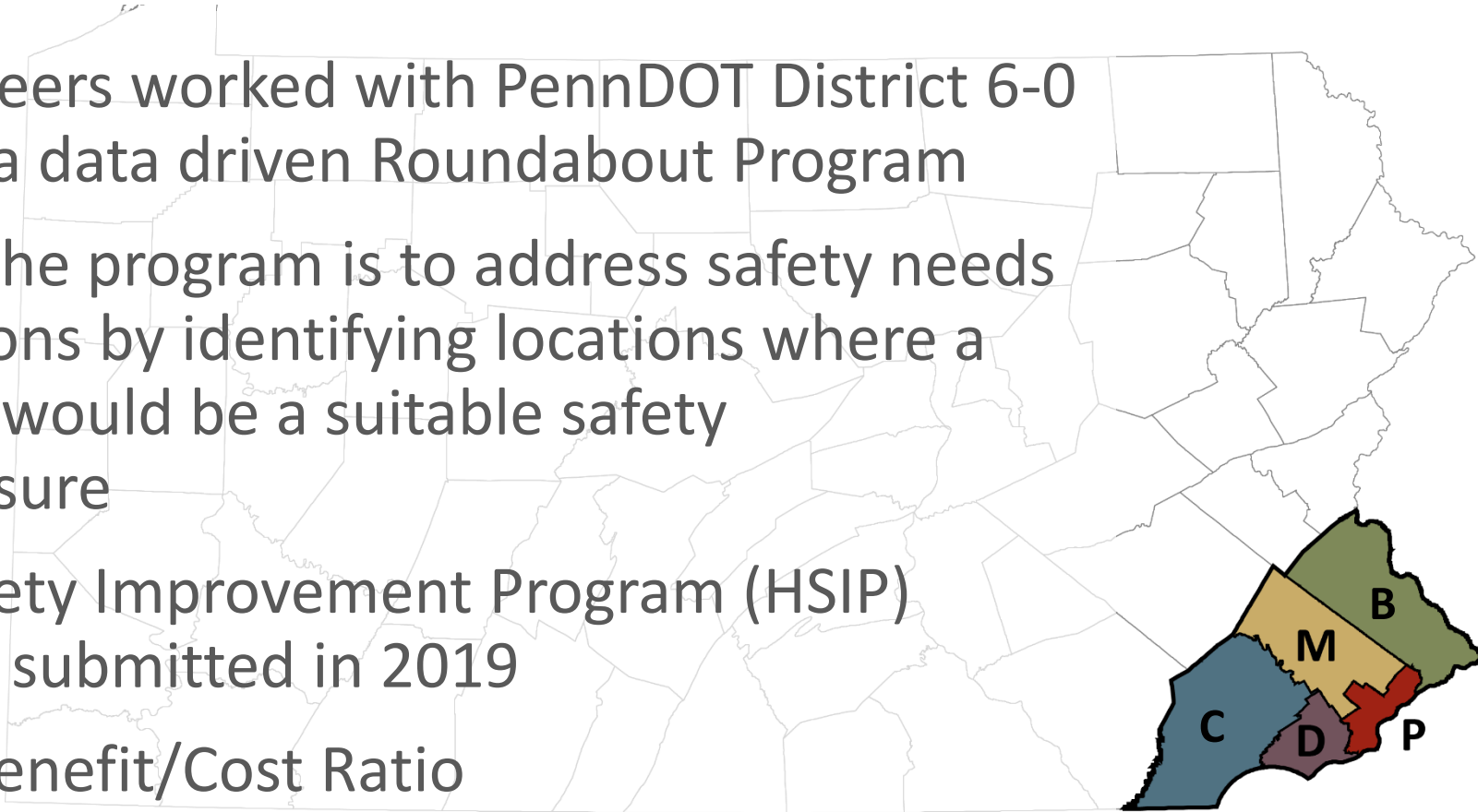
0 150 300 FEET



PROJECT SELECTION

District-Wide 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
- Prioritized Benefit/Cost Ratio



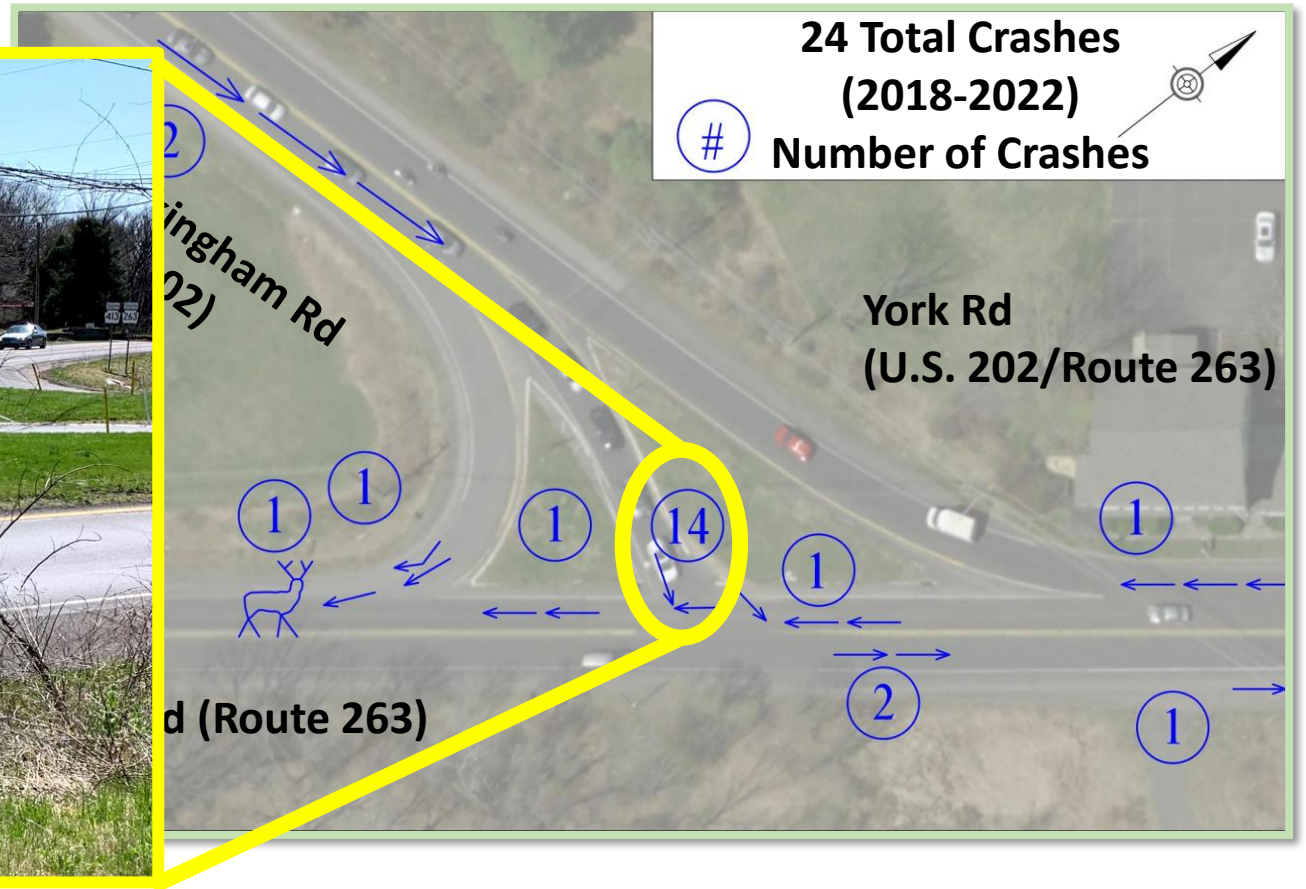
DISTRICT 6-0



PURPOSE



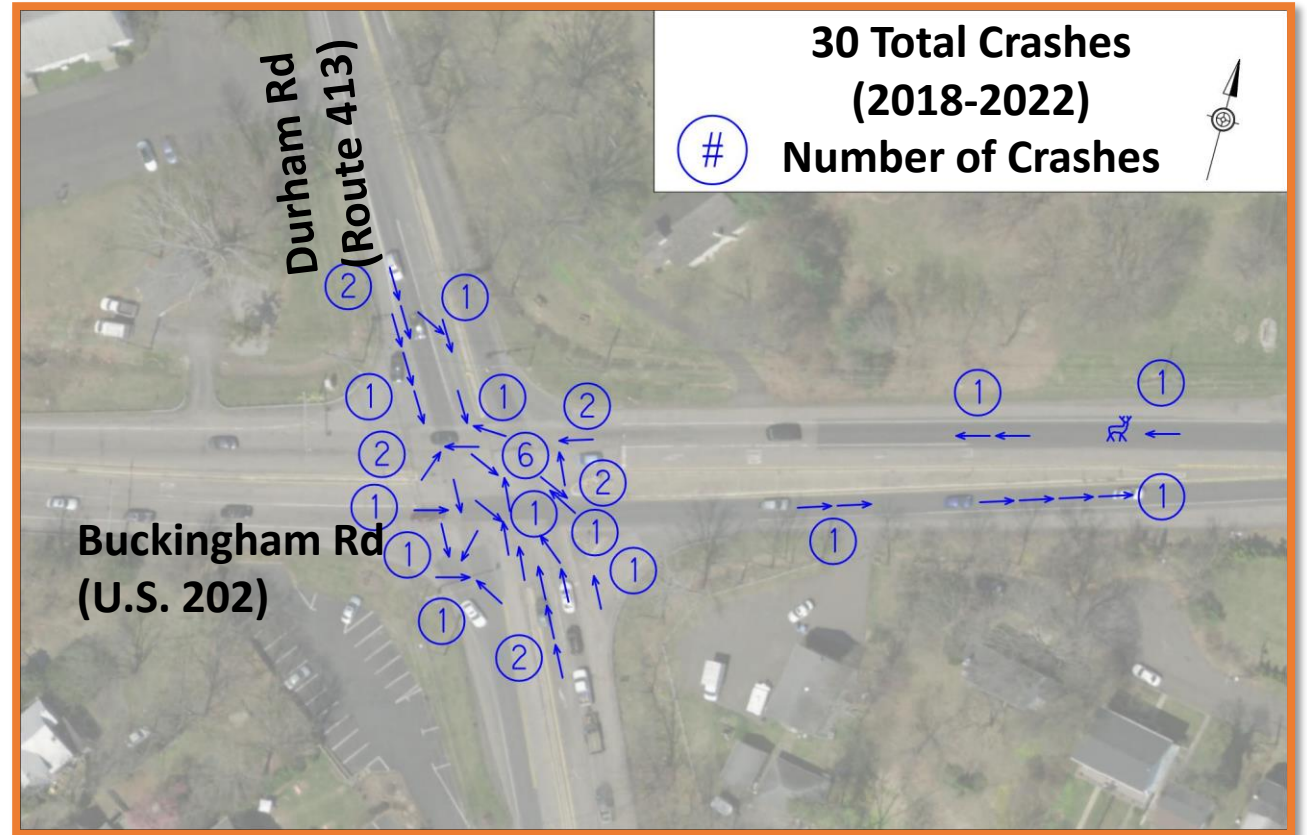
Source: Urban – Site visit on April 5, 2021



PURPOSE

U.S. 202 & Route 413 Buckingham Rd & Durham Rd

- SR 0202/0413 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.
 - 63% of reported crashes were angle crashes.
 - 90% of reported crashes had no weather or environmental factors.



PURPOSE

- Reduce the amount and severity of crashes at the intersections.
- Relieve congestion
- Improve accessibility



Source: PennDOT website

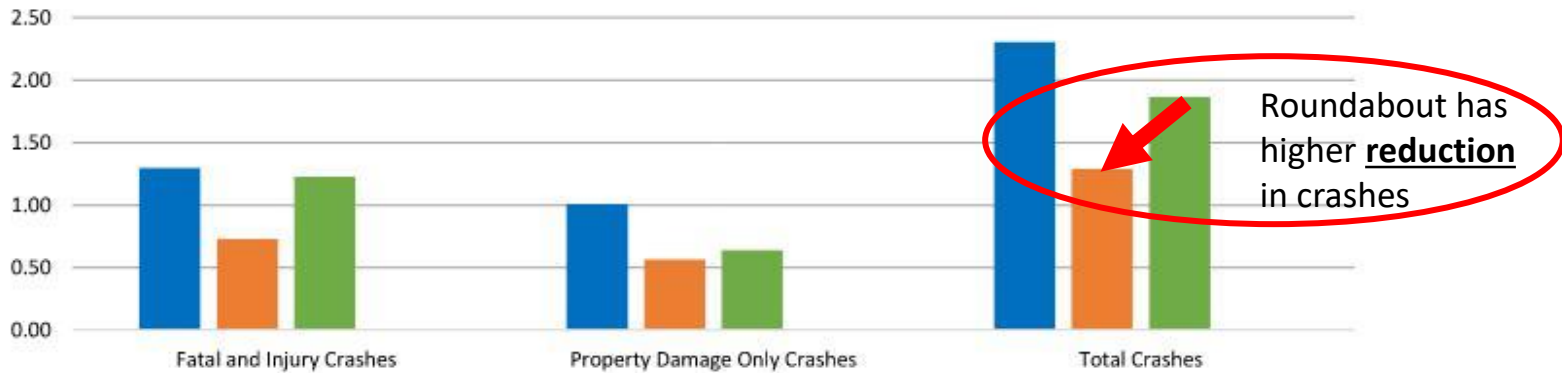


INTERSECTION CONTROL EVALUATION (ICE)

- Federal HSIP funding requires benefit/cost analysis to secure construction funding.



Summary of Predicted Crash Performance - Alternative Analysis



- Roundabout shows a **higher reduction** in crashes
- Roundabouts are generally safer and more efficient than traffic signals
- Traffic signal would require realignment and create more impacts to the local properties/businesses

Safety Performance Summary

Project Totals	Total Crashes		
	Existing	Roundabout	Traffic Signal
Predicted Average Annual Crash Frequency	2.31	1.29	1.87
Expected Average Annual Crash Frequency	--	--	--
Change from Existing Conditions	--	-1.02	-0.44



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



ROUNDAABOUT BENEFITS

Benefits of Roundabouts

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

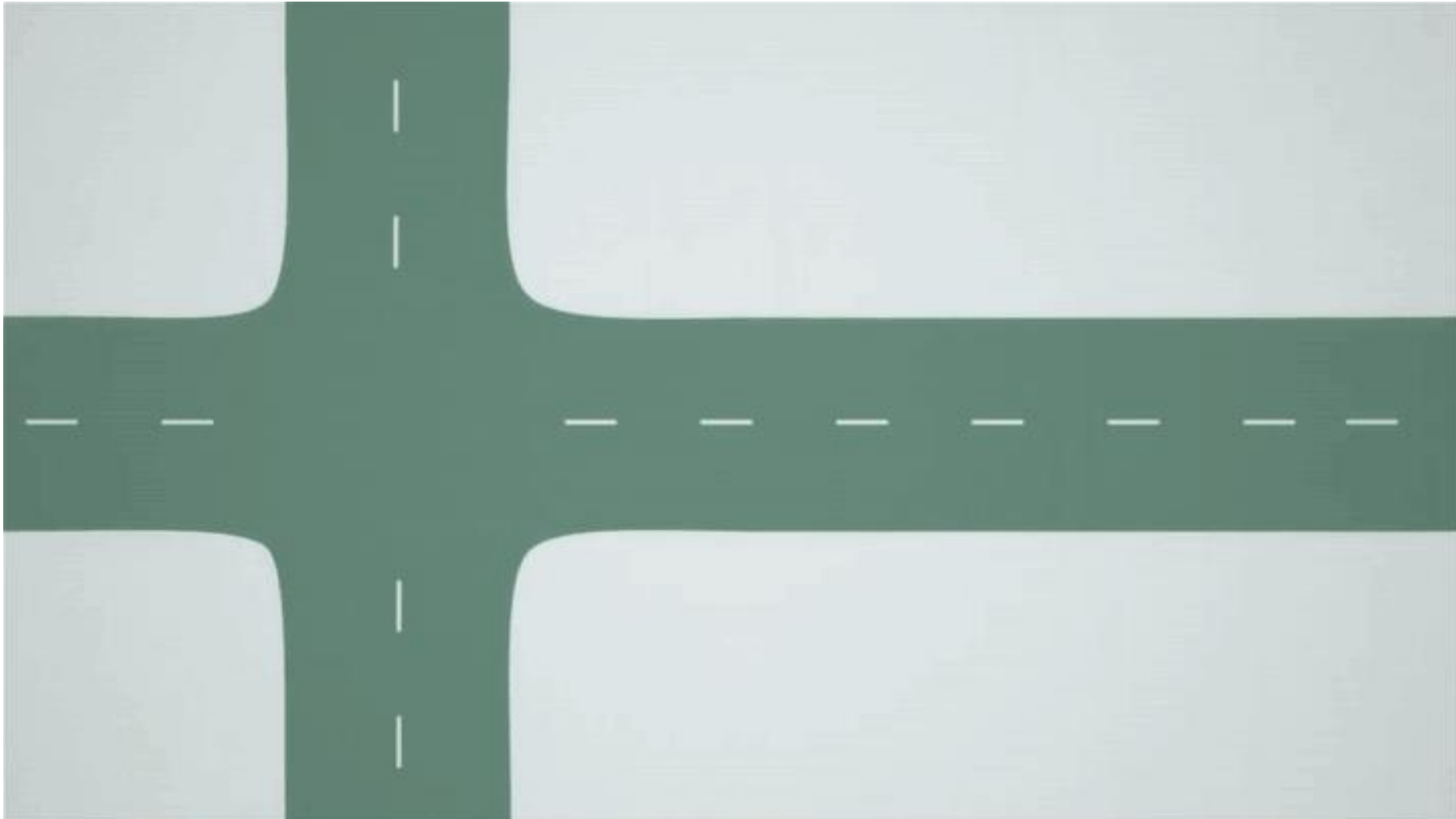


Source: Vision ZERO



ROUNDABOUTS

Vehicular Conflicts at Intersections



Source: Utah Department of Transportation



ROUNDAABOUTS

Vehicular Conflicts at Intersections

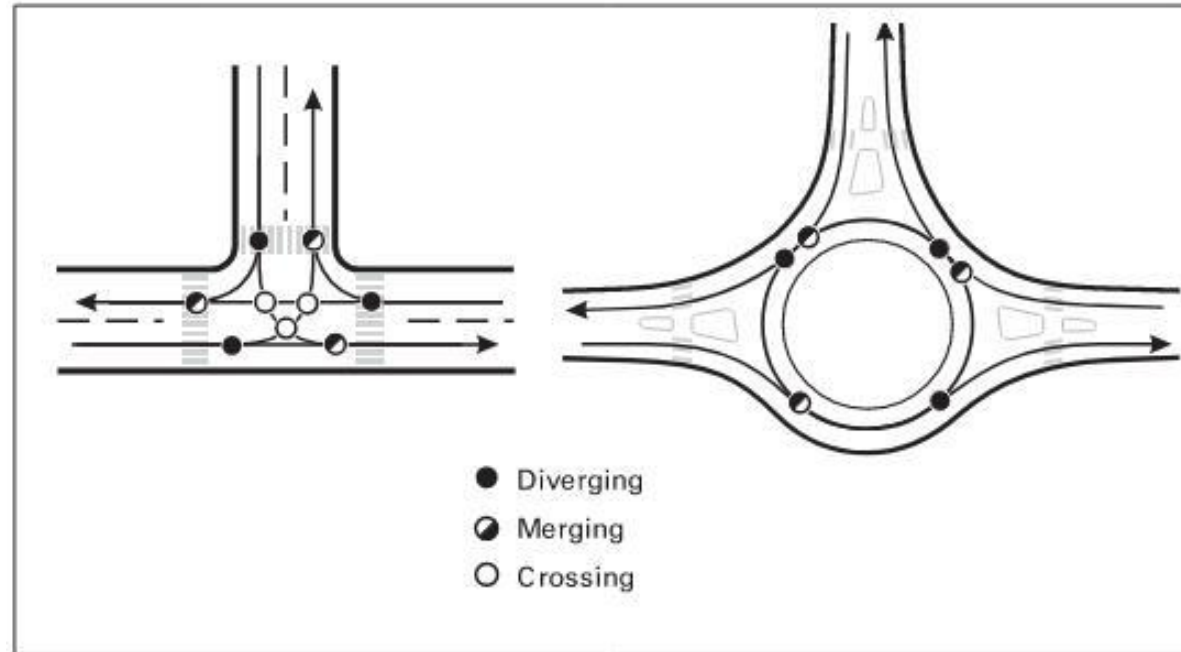


Exhibit 5-1. Vehicle conflict points for "T" Intersections with single-lane approaches.

Source: FHWA – Roundabouts: An Information Guide – Chapter 5

Traditional 3-leg Intersection

9 Conflict Points

Roundabout (3-leg)

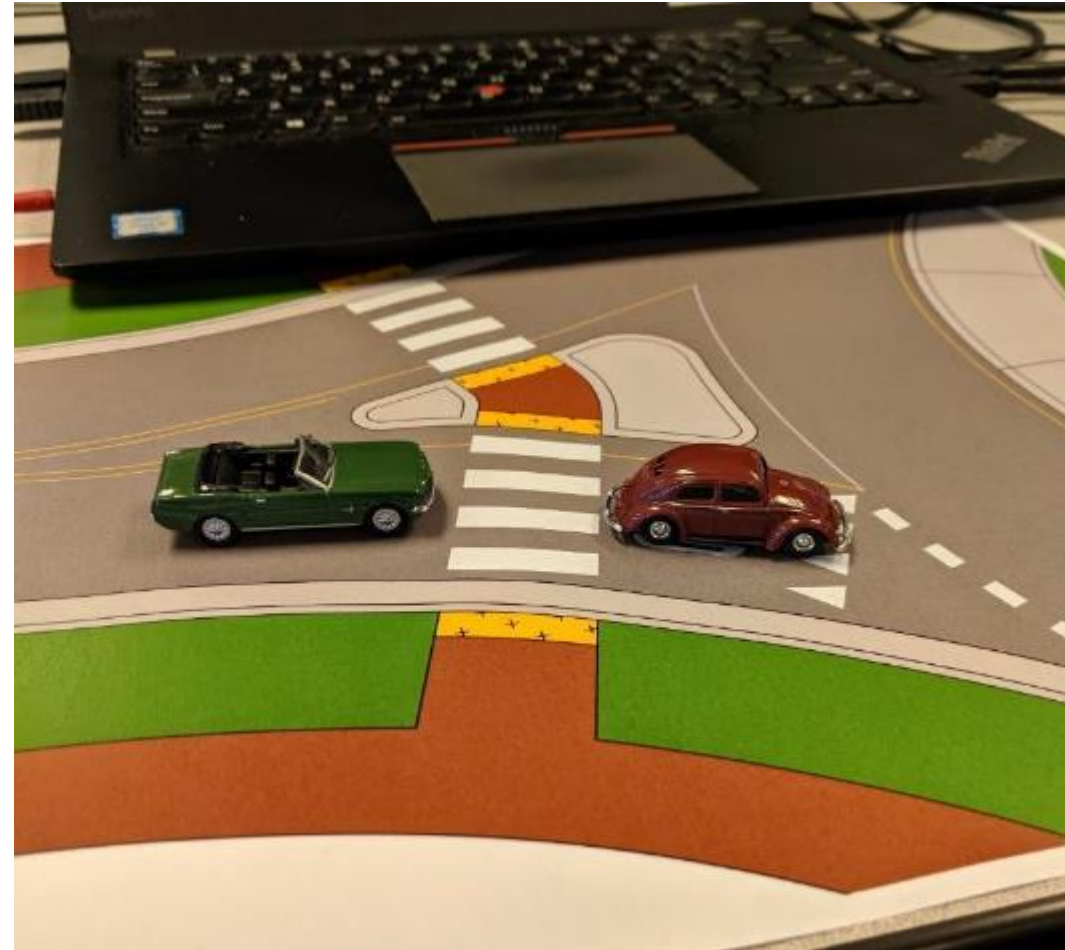
6 Conflict Points



ROUNDABOUTS & 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*



SAFETY CONSIDERATIONS

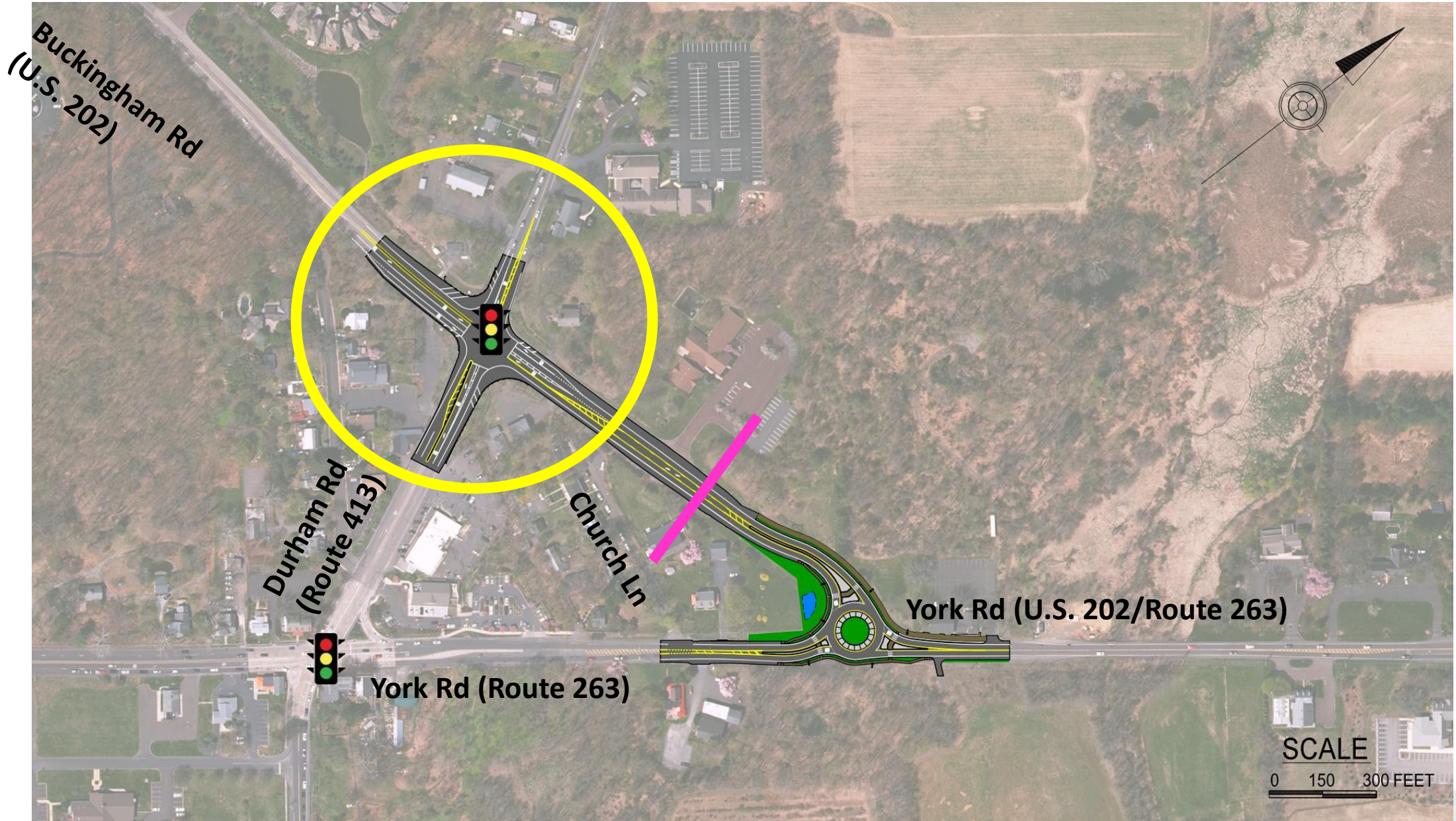
Roundabout Intersection Lighting



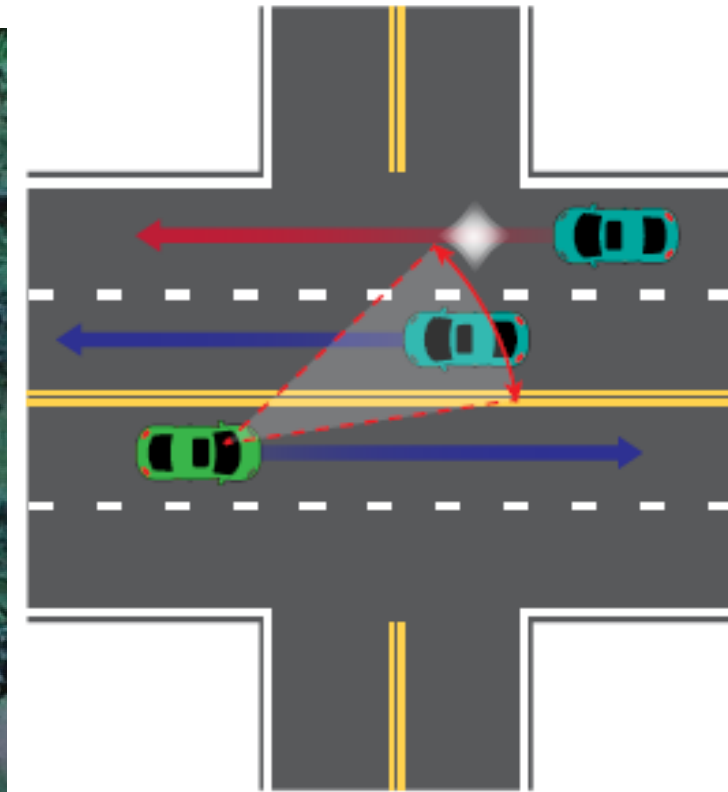
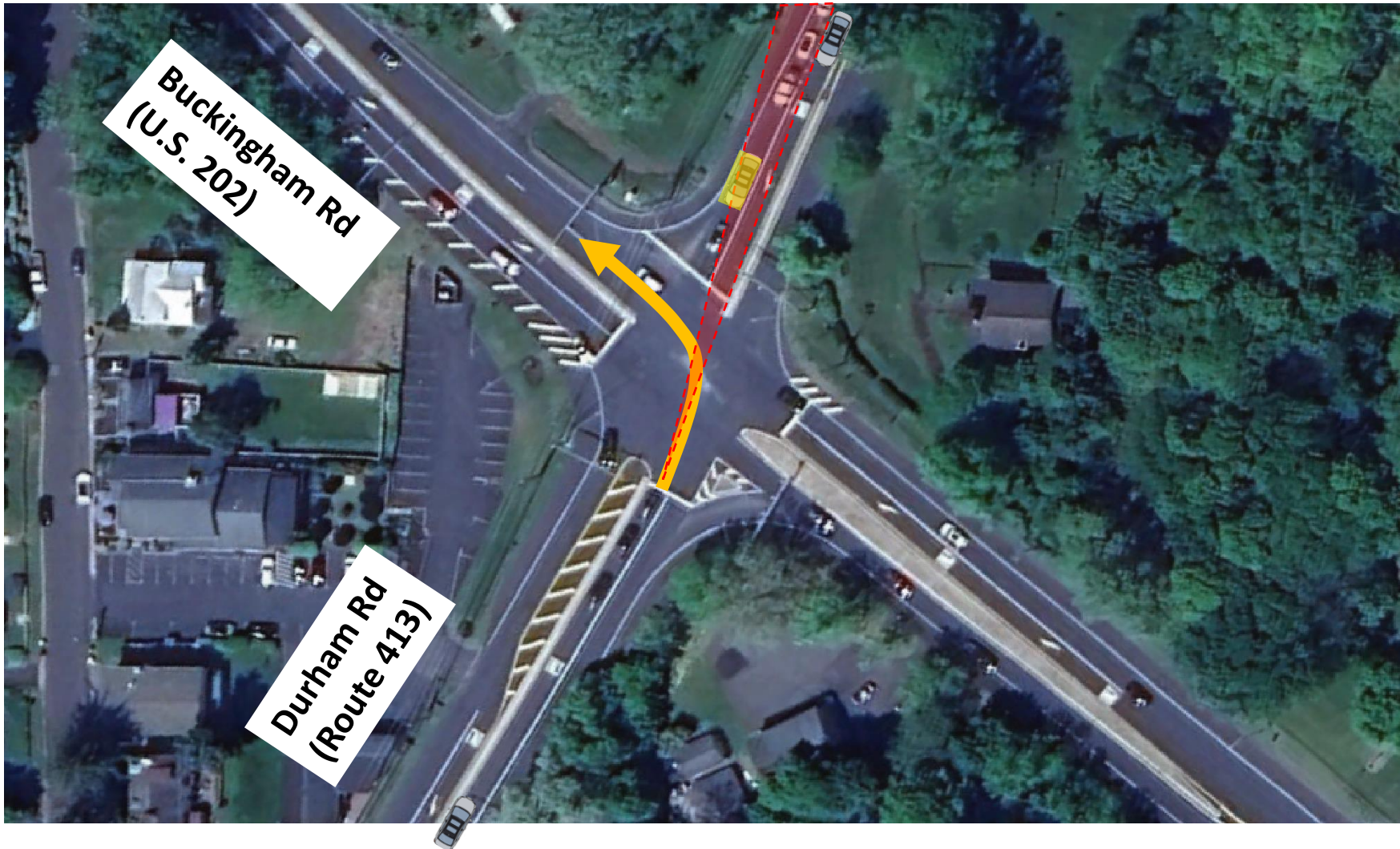
PROPOSED DESIGN



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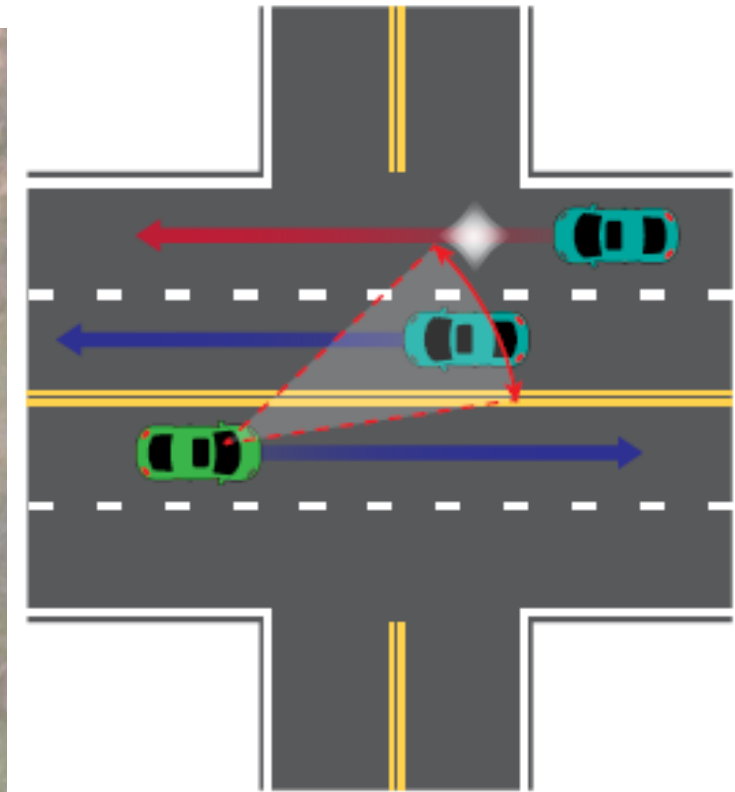
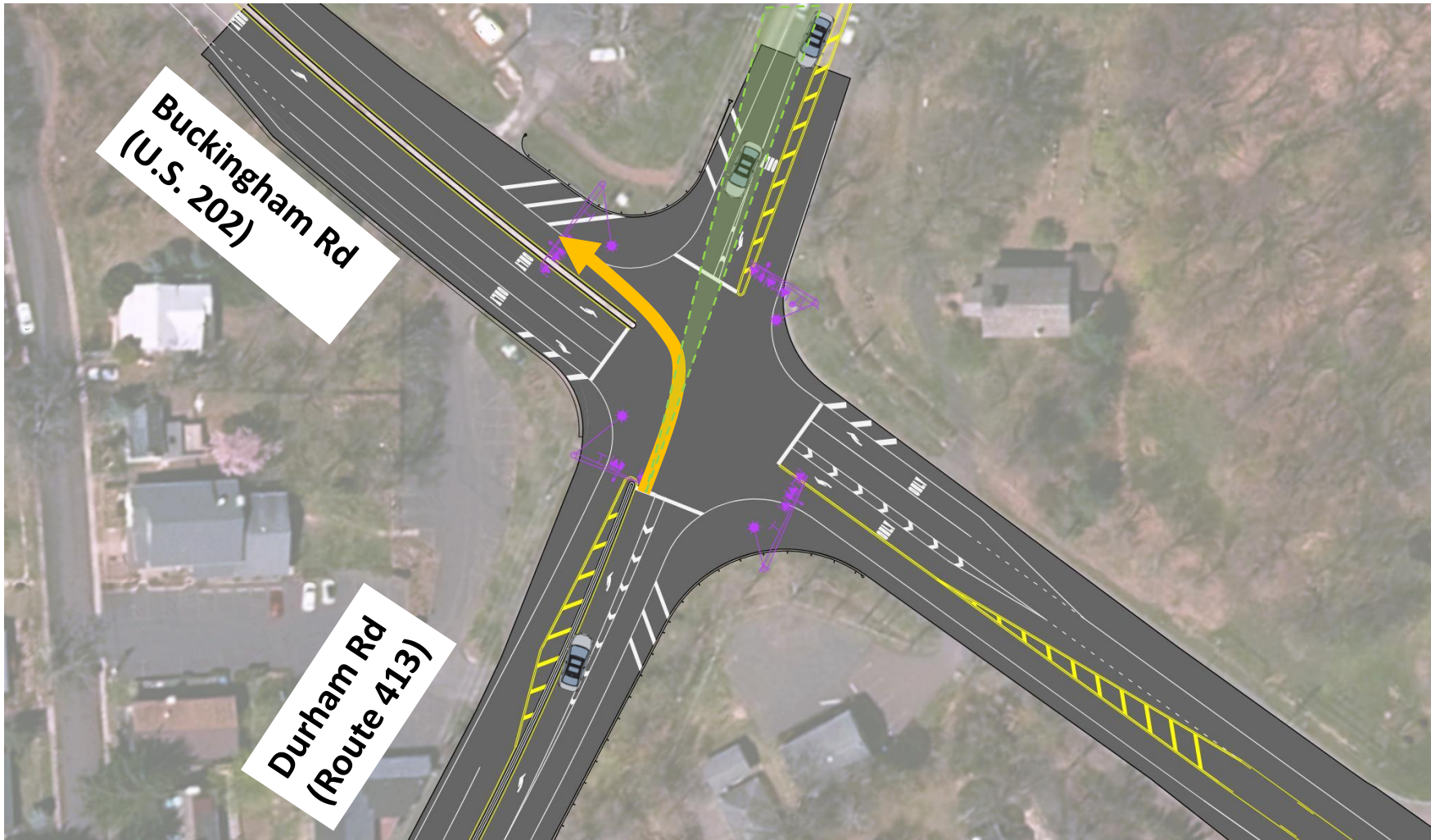
PROPOSED DESIGN



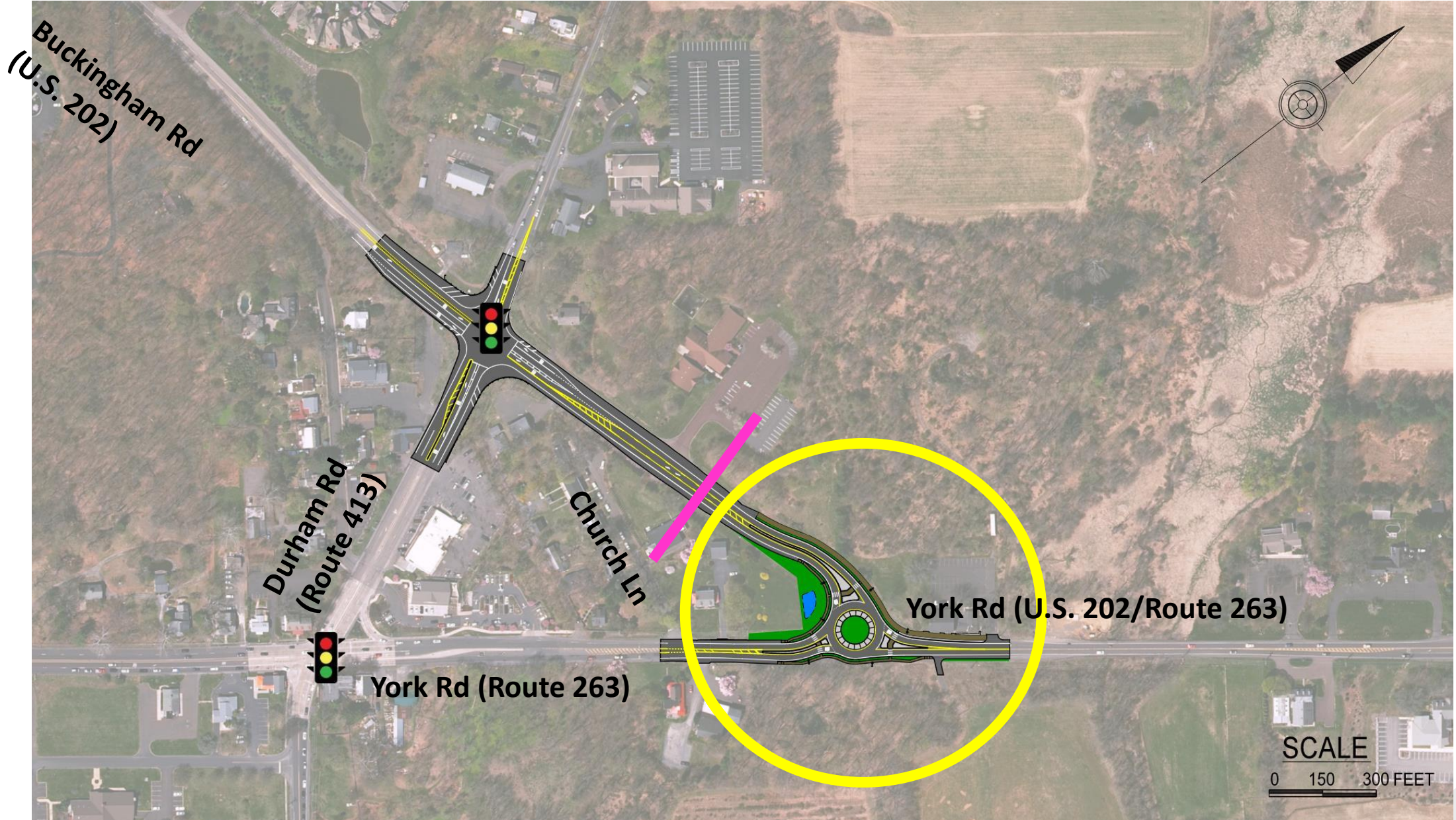
Shadow Vehicle restricts sight line of opposing thru traffic



PROPOSED DESIGN



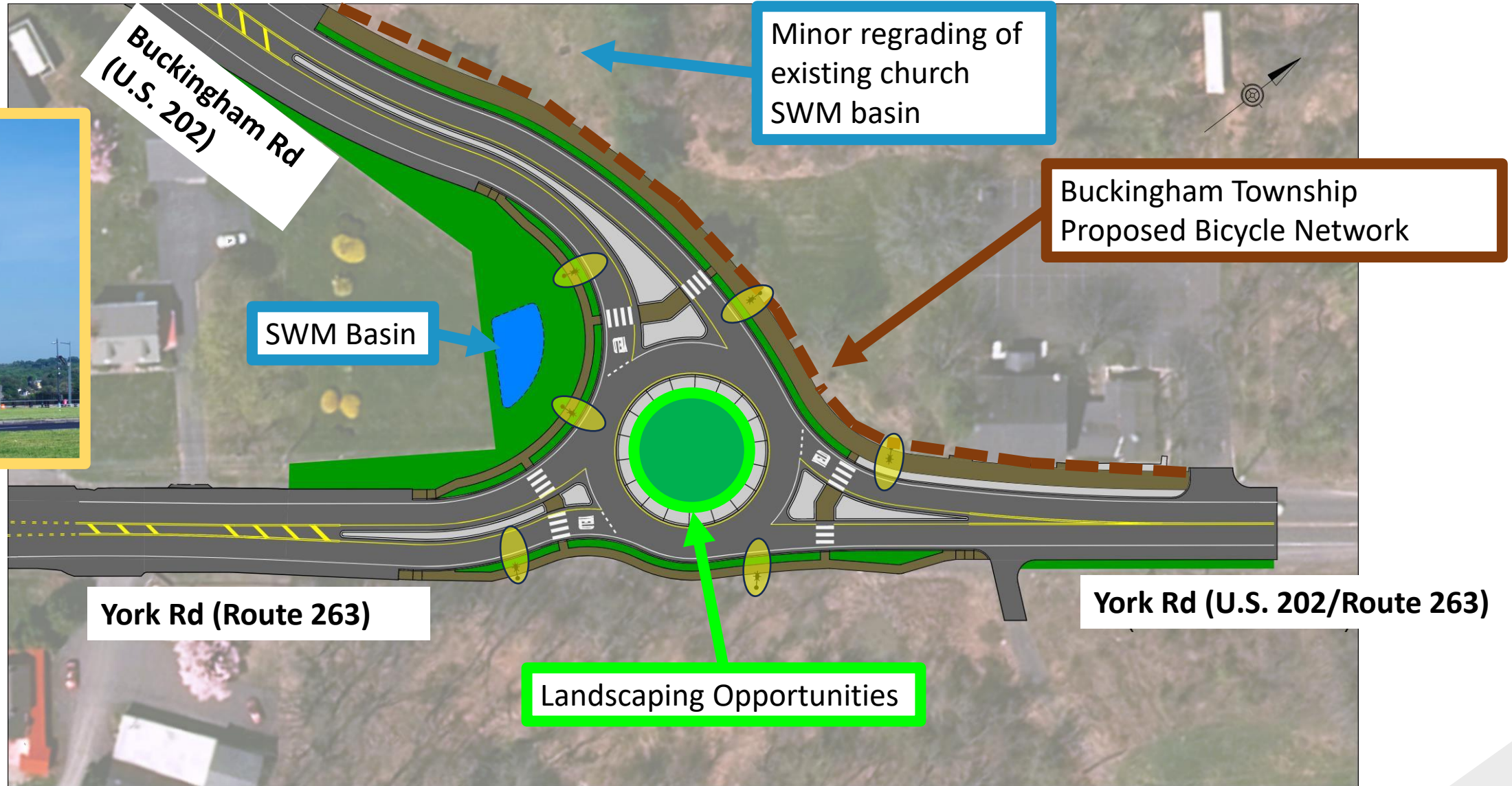
PROPOSED DESIGN



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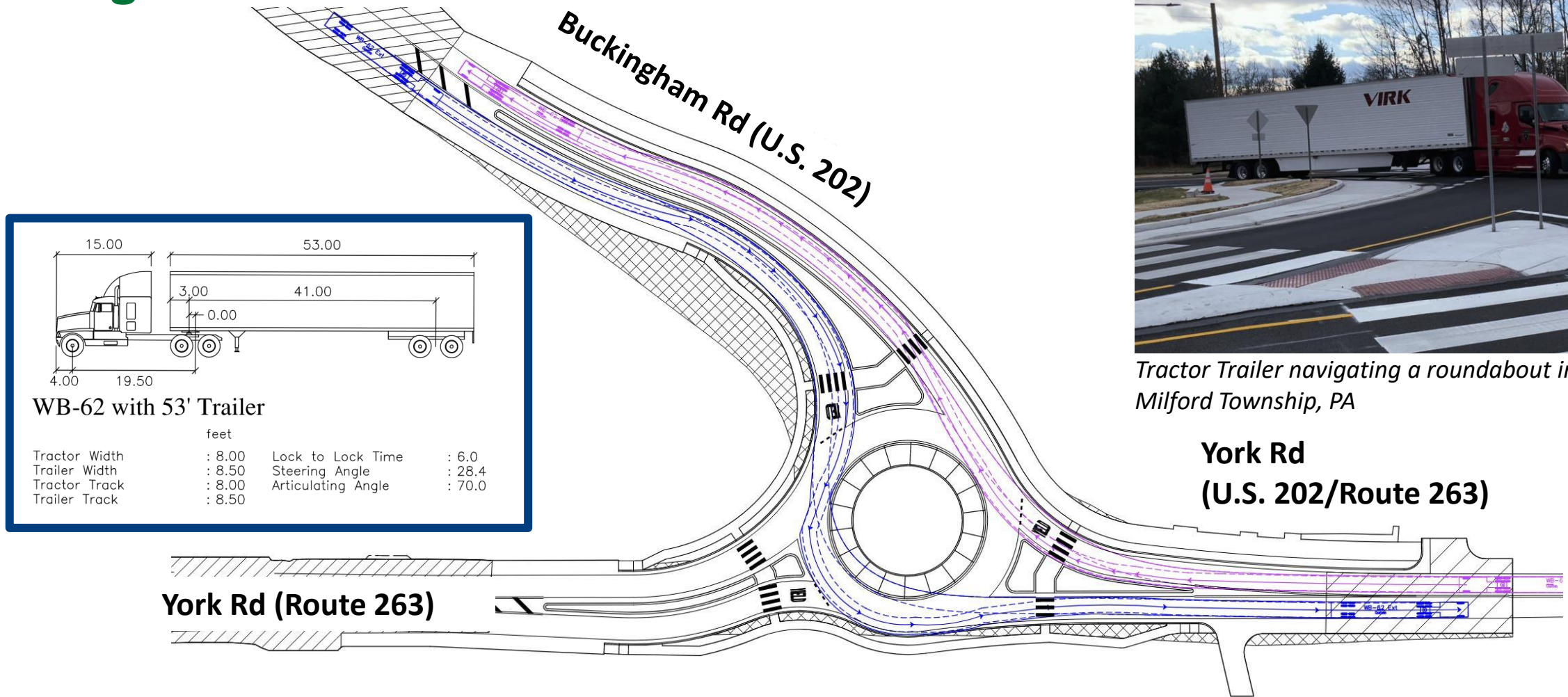


PROPOSED DESIGN



OPERATIONS

Large Vehicles Accommodations

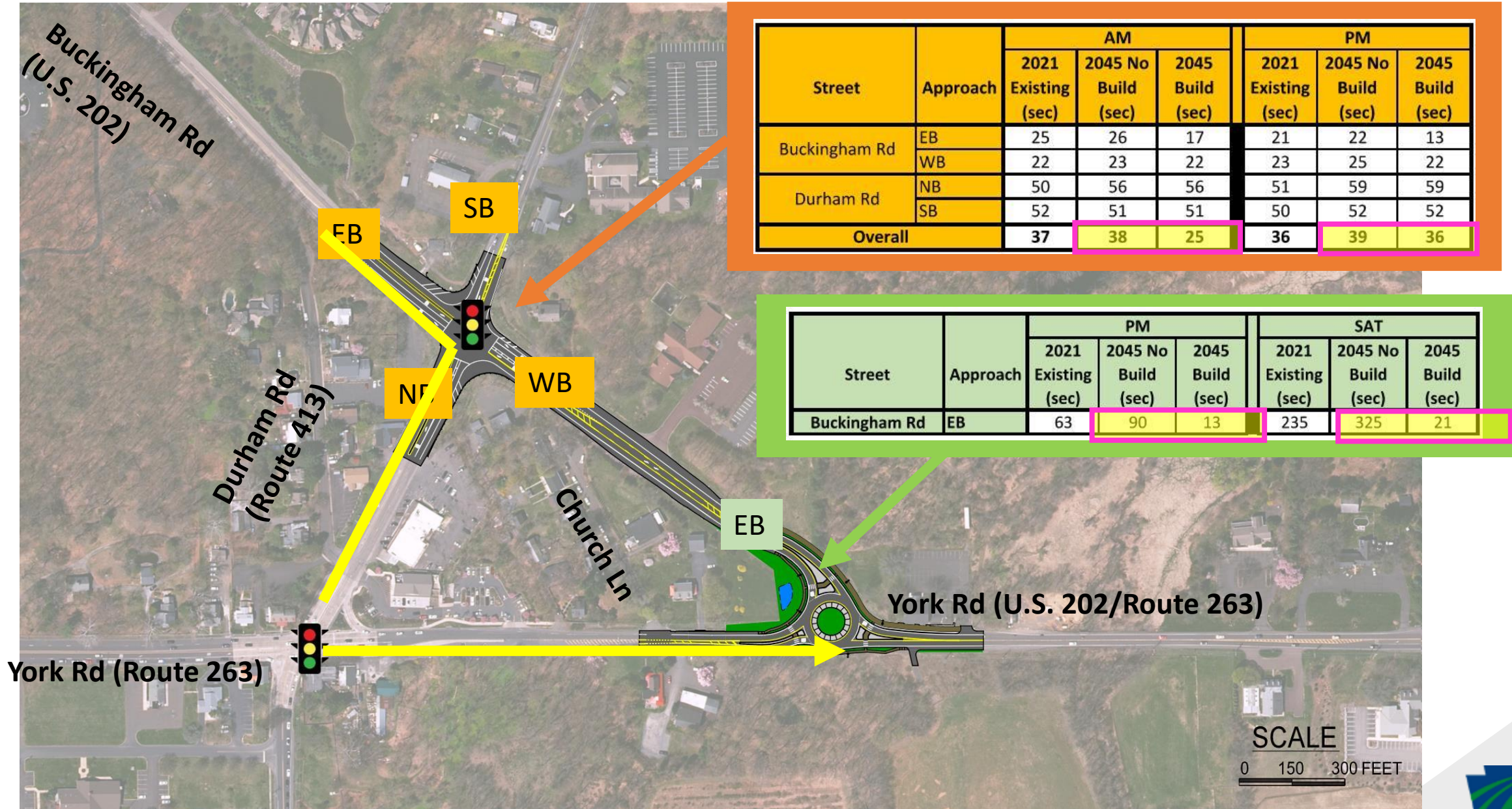


Tractor Trailer navigating a roundabout in Milford Township, PA

**York Rd
(U.S. 202/Route 263)**



OPERATIONS



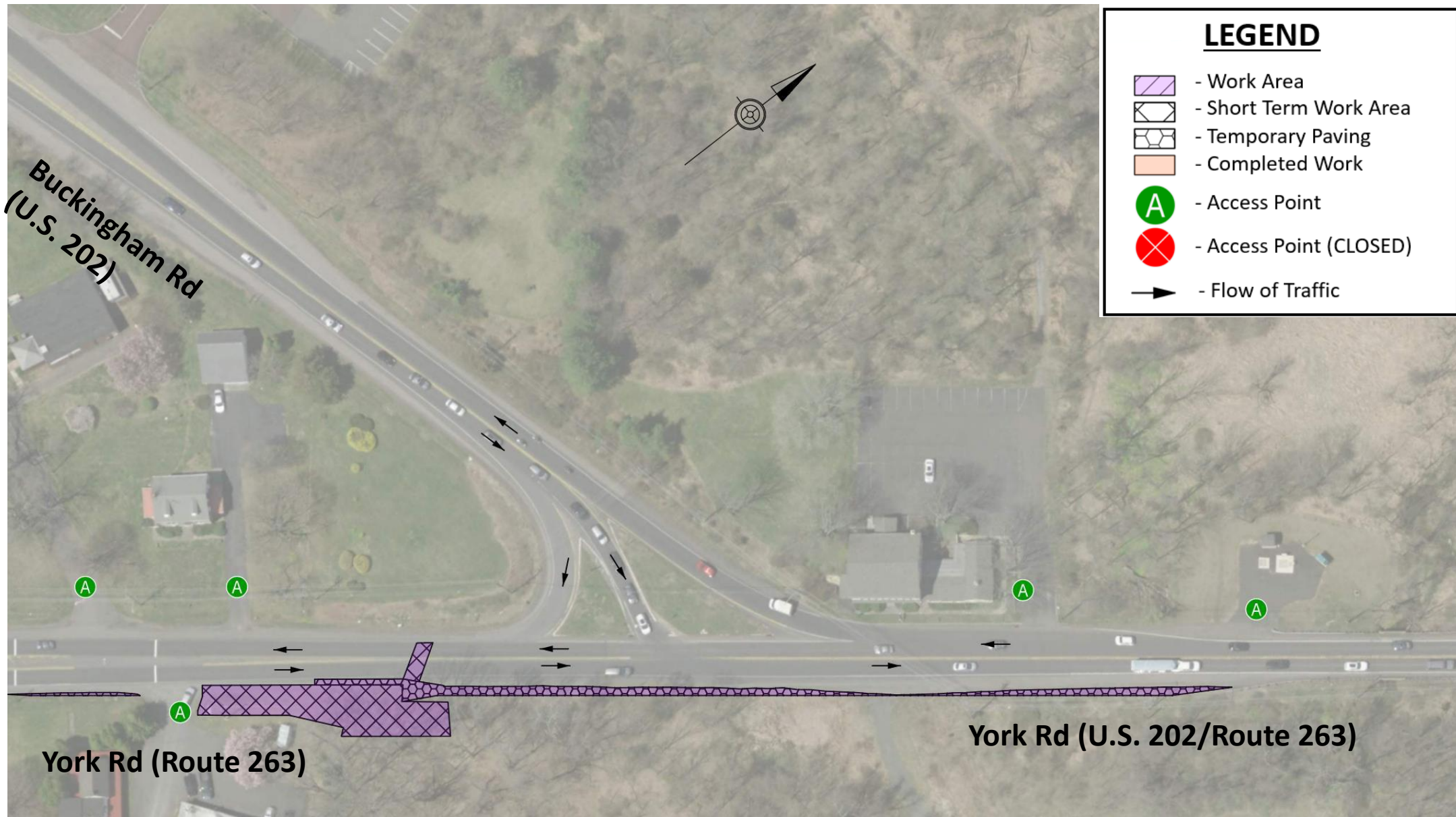
TRAFFIC SIMULATION



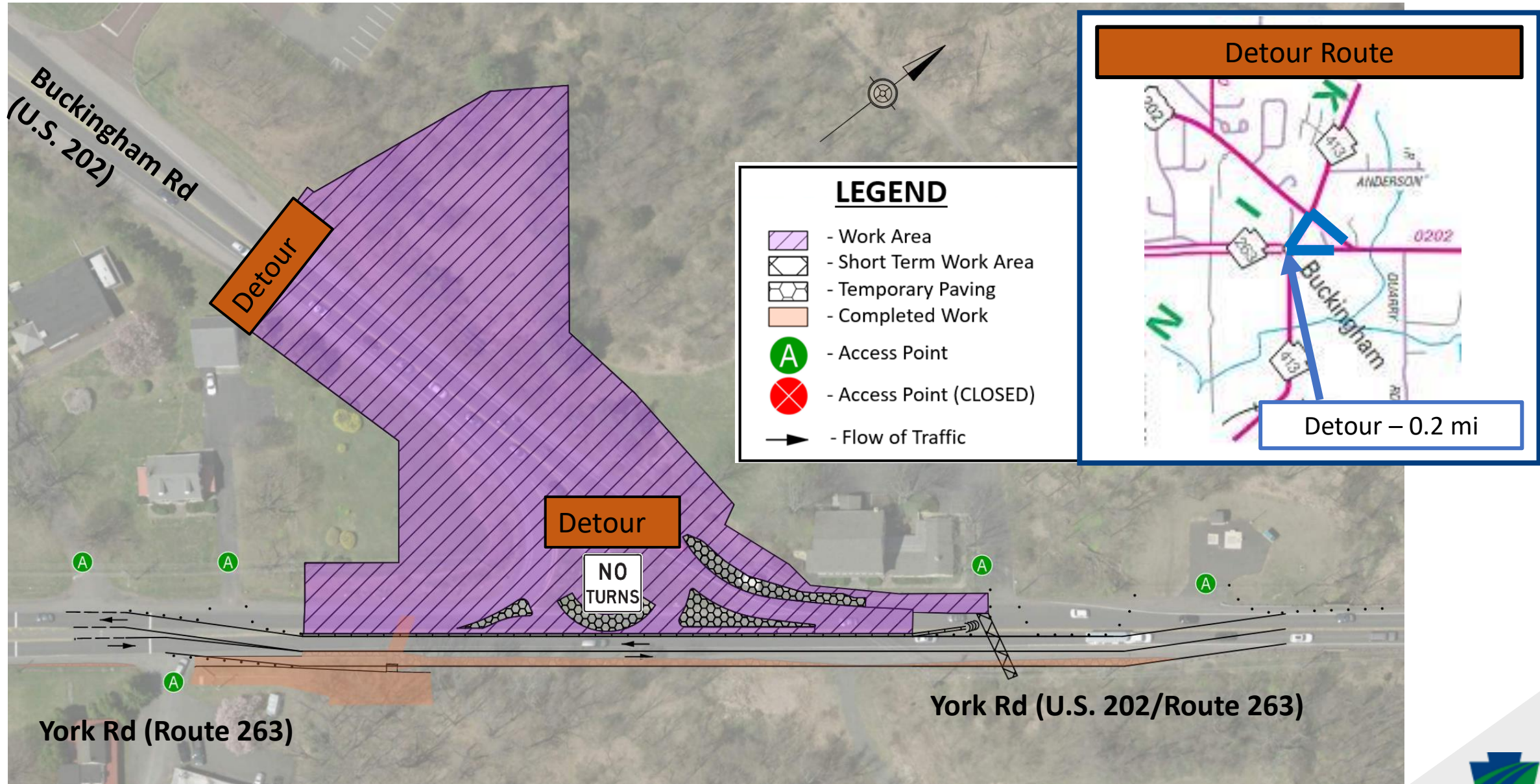
ROUNDAABOUT EXAMPLES



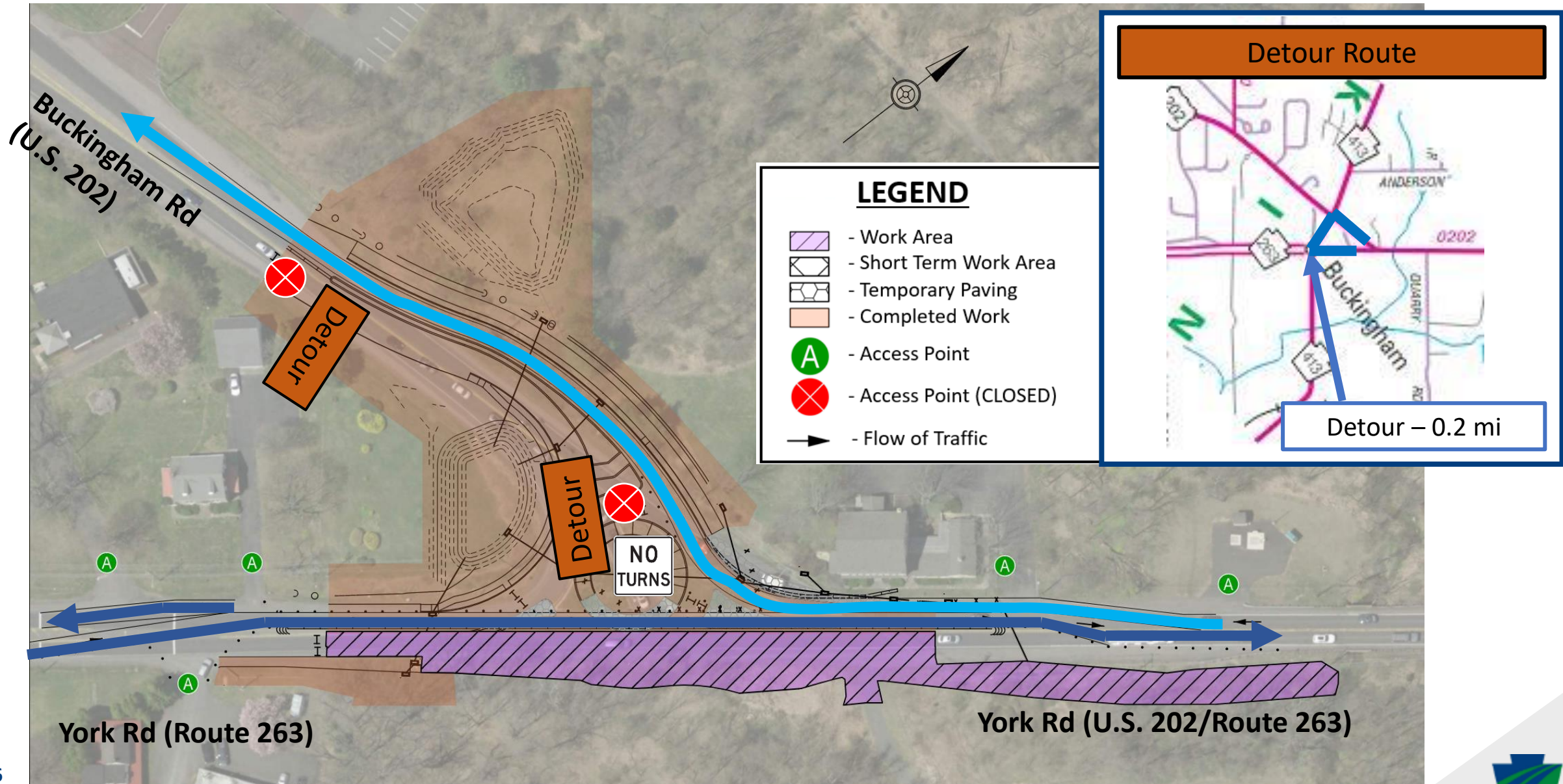
CONSTRUCTION - STAGE 1



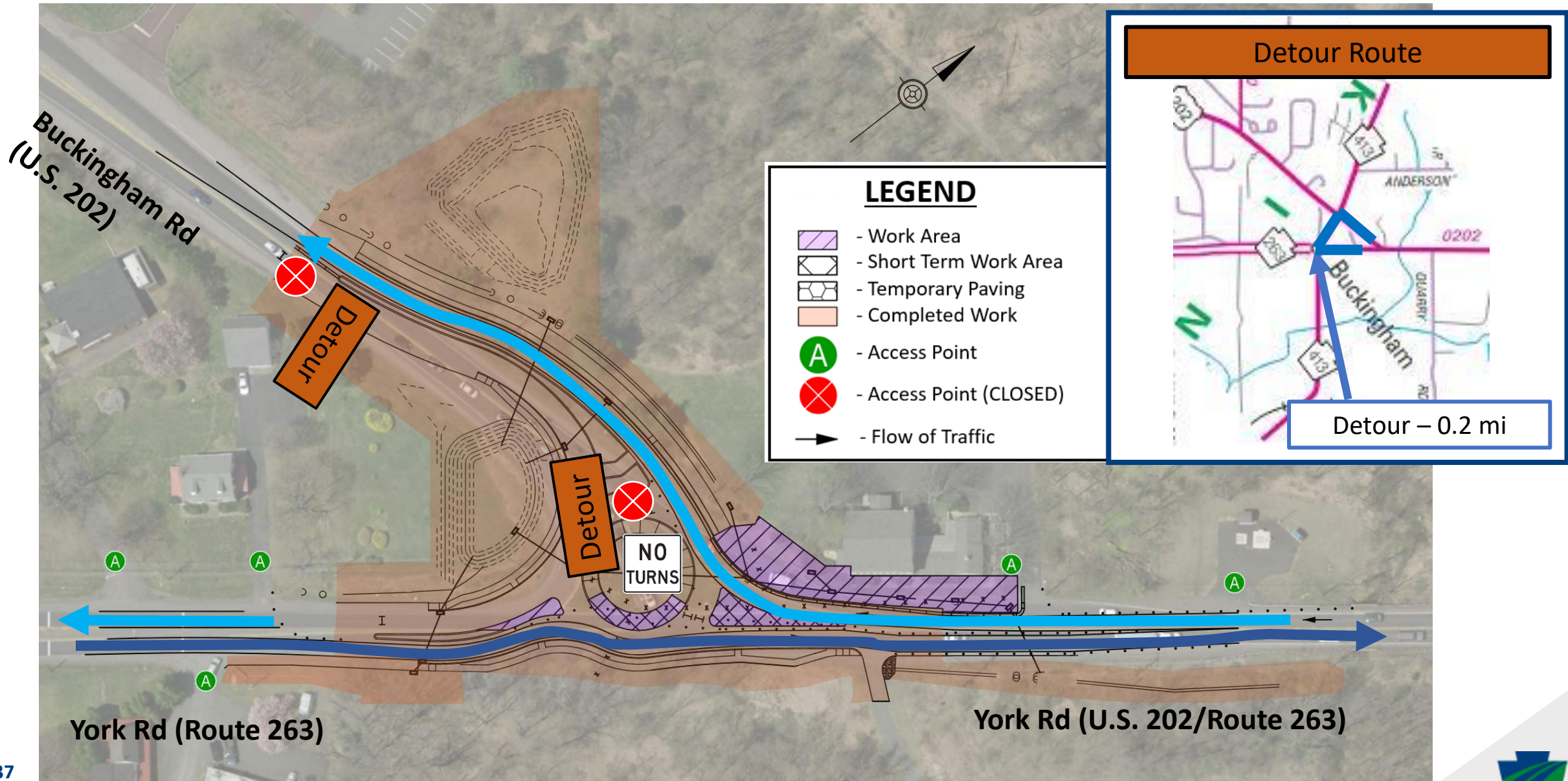
CONSTRUCTION - STAGE 2



CONSTRUCTION - STAGE 3

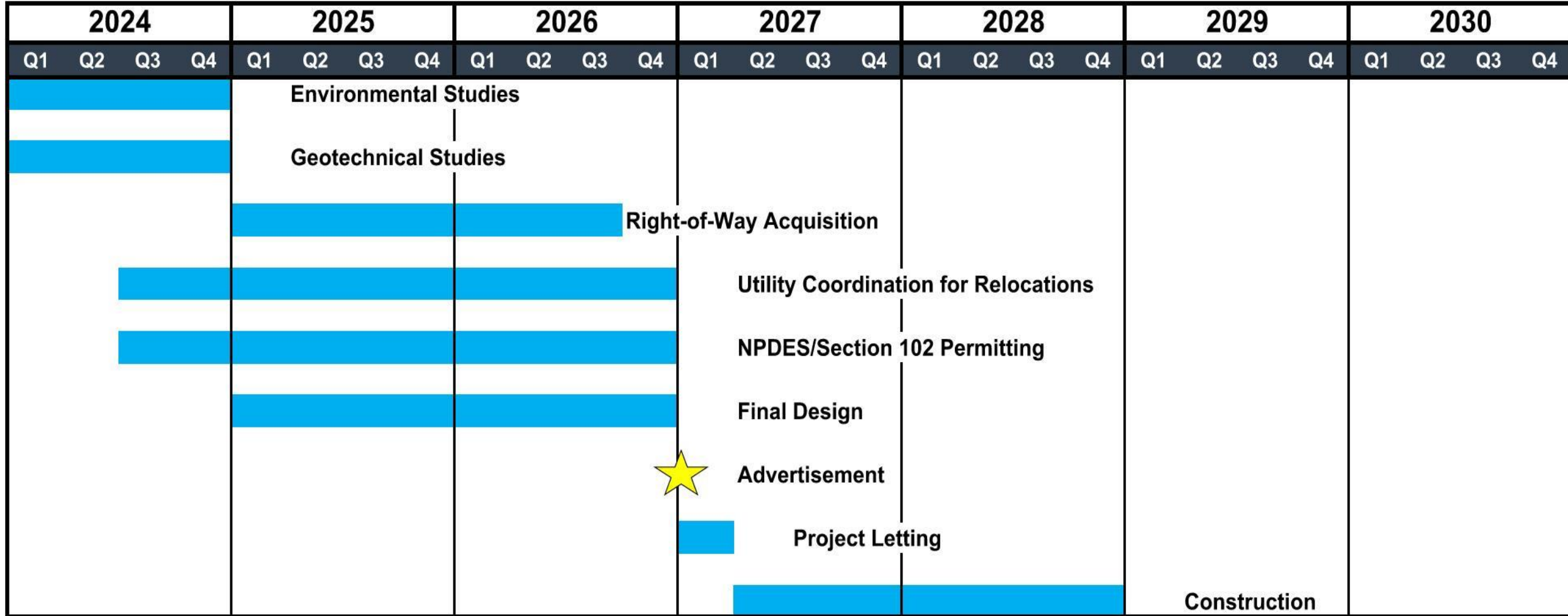


CONSTRUCTION - STAGE 4



PROJECT TIMELINE OVERVIEW

Upcoming Activities



QUESTIONS?

THANK YOU

Contact Information

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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-](https://www.penndot.pa.gov/RegionalOffices/district-6/ConstructionsProjectsAndRoadwork/BucksCounty/Pages/U.S.-202-and-York-Road-Roundabout-Construction.aspx)

[6/ConstructionsProjectsAndRoadwork/BucksCounty/Pages/U.S.-202-and-York-Road-Roundabout-Construction.aspx](https://www.penndot.pa.gov/RegionalOffices/district-6/ConstructionsProjectsAndRoadwork/BucksCounty/Pages/U.S.-202-and-York-Road-Roundabout-Construction.aspx)



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