

**Engineering Technical  
Memorandum  
for the  
State College Area Connector  
Project**



July 2025

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## Introduction

The State College Area Connector Planning and Environmental Linkages (PEL) Study identified transportation needs within southern Centre County, Pennsylvania in a 70 square mile initial study area. The study evaluated a range of alternatives to determine how they addressed the Study's purpose and need, balanced impacts on the natural and built environment, addressed traffic concerns within the overall study area, met engineering considerations such as constructability, cost, and considered area planning goals. The PEL Study screened nine build alternative corridors to determine the best options to advance for National Environmental Policy Act (NEPA) evaluation and preliminary engineering. Based on the impact analysis, three corridors were identified (US 322-1S, US 322-1OEX, and US 322-5) to be advanced as reasonable alternatives.<sup>1</sup>

The final PEL Report was published in June 2023 and the Federal Highway Administration (FHWA) acknowledged in a letter, dated September 14, 2023, that the PEL Study was consistent with 23 USC Section 168 and 23 CFR 450.212. As a result, the PEL findings provided a starting point for the NEPA studies and preliminary engineering efforts. Additionally, FHWA concurred that an Environmental Impact Statement (EIS) was the proper NEPA classification for the State College Area Connector project.

The PEL Study also identified other transportation projects which did not meet the full purpose and need identified in the PEL but could provide transportation benefits to the study area roadways independently. One such project was a safety study along PA 45 generally from Boal Avenue to PA 144. Additionally, detailed traffic investigations and analysis and coordination with local officials for the State College Area Connector project determined that the proposed connector road and midpoint interchange would provide some localized improvements to PA 45. However, it was determined that the connector road and associated interchange did not address the project's purpose and need, nor did it address corridor wide issues along PA 45. As a result, the proposed midpoint interchange and local road connection was removed from this State College Area Connector project and will be considered in the independent PA 45 Safety Corridor Improvements project, as appropriate. The State College Area Connector project will advance independently but will not preclude the inclusion of a future interchange and local road

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<sup>1</sup> For more information on the PEL alternative develop and screening process see the *Engineering Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (revised June 2023)* and the *Alternative Analysis and Screening Report for the State College Area Connector Planning and Environmental Linkages Study (revised June 2023)*.

connection should the independent safety study along PA 45 determine that it would be beneficial in connection with other proposed PA 45 corridor improvements.<sup>2</sup>

Following the PEL Study and removal of the proposed PA 45 connector road and midpoint interchange, a refined project area was developed that is centered along the US 322 corridor and encompasses approximately six square miles to include the three reasonable corridor alternatives. The project area also provided a boundary for the team to conduct detailed field investigations and preliminary engineering investigations to address the transportation purpose and needs as part of the National Environmental Policy Act (NEPA) process.

This technical memorandum documents the engineering efforts taken to advance the three PEL Build Alternatives Corridors (US 322-1S, US 322-1OEX, and US 322-5) into preliminary engineering Build Alternative alignments.

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• <sup>2</sup> For more traffic information, see the *State College Area Connector Project Pre-NEPA Activities (Interchange Access Concepts & Analysis) Technical Memorandum* (July 2025).

## Build Alternative Development Methodology

### Roadway Design Criteria and Typical Section

While the PEL Build Alternative typical section was utilized as a starting point for refining the PEL Build Alternative corridors into alignment alternatives, the horizontal and vertical geometry were modified from the PEL Study to minimize and avoid adverse impacts to farms, residential and commercial properties, and natural or historic resources in accordance with the current design criteria. The current design criteria are outlined in **Table 1**.

Utilizing the roadway design criteria, typical sections were developed for the Build Alternative (Mainline 322), PA 45, and local roads. **Figures 1 and 2** depict the various typical sections for this project.

### Roadway Template and Alignment Development

Following the development of the typical sections, roadway templates were developed to aid in creating the Build Alternative alignments based on the parameters outlined in **Table 1** (e.g., travel lanes, shoulders, median, and side slopes). Grade lines were established to generally follow the existing topography with an attempt to limit the height of cuts or fills required as measured along the baseline. The template was applied to the vertical alignment to determine where the proposed excavation or embankment intersected with the existing ground, to generate a corridor footprint.

The template was initially located along the three PEL Build Alternatives advanced for further study. The design team then worked to shift the alternative alignment to avoid and minimize effects to key natural, cultural, and socioeconomic resources that were field identified and delineated. Resources considered for avoidance and minimization included productive agriculture lands and associated farm structures; wetland; streams; floodplains; residential, commercial, and recreation facilities; historic properties; critical habitat areas; and geologic formations of concern to name a few. Once the resources were avoided and effects minimized to the greatest extent possible, a 25 to 50-foot buffer was applied to each side of the alternative and a conceptual limit of disturbance (LOD) was determined. In areas of anticipated utility relocations, the buffer was increased to accommodate anticipated utility needs to establish the LOD.

**Table 1 – Engineering Design Criteria**

Design Element	Build Alternative (Figure 1)	Limited Access Ramps	PA 45 (Figure 2B – PA 45 Typical Section)	Local 322 (PA 45 to Bear Meadows) (Figure 2A – Local 322 Typical Section)	Local 322 (Bear Meadows to Potters Mills) (Figure 2A – Local 322 Typical Section)	Boal Avenue Extension	Local Road – Urban (Figure 2B – Urban Typical Section)	Local Road – Rural (Figure 2B – Rural Typical Section)
FUNCTIONAL CLASSIFICATION	Interstates/Freeways (Rural)	Limited Access Freeway	Minor Arterial (Urban)	Major Collector (Urban)	Minor Collector (Rural)	Minor Collector (Suburban)	Local Roads (Urban)	Local Roads (Rural)
TYPOLOGY	Limited Access Freeway, Rural Non-Interstate	Limited Access Freeway, Rural Non-Interstate	Regional Arterial, Urban	Community Collector, Urban Corridor	Community Collector, Rural Places	Community Collector, Suburban Corridor	Local Road, Urban Places	Local Road, Rural Places
DESIGN SPEED	60 MPH	30 MPH to 50 MPH	40 MPH (35 MPH Posted)	35 MPH (35 MPH Posted)	50 MPH (45 MPH Posted)	35 MPH (35 MPH Posted)	30 MPH (30 MPH Posted)	30 MPH (30 MPH Posted)
PAVEMENT WIDTH	4 - 12' Lanes	12' - Minimum to 16' - Maximum	11' Lanes Minimum	11' Lanes Preferred	11' Lanes Minimum	11' Lanes Minimum	9' to 11' Lanes	9' to 10' Lanes
SHOULDER WIDTH	12' Right, 8' Left	8' Right, 4' Left	8' Minimum	6' Preferred	6' Minimum	8' Preferred	2' to 6'	2' to 4'
FILL SLOPES	1:2 Slopes	1:2 Slopes	1:2 Slopes	1:2 Slopes	1:2 Slopes	1:2 Slopes	6' Rounding, 1:4 slopes less than 15'; 1:3 slopes greater than 15' or 1:2 slopes w/o rounding, with guiderail	6' Rounding, 1:4 slopes less than 15'; 1:3 slopes greater than 15' or 1:2 slopes w/o rounding, with guiderail
CUT SLOPES	Swale with 1:2 Slopes	Swale with 1:2 Slopes	Swale with 1:2 Slopes	Swale with 1:2 Slopes	Swale with 1:2 Slopes	Swale with 1:2 Slopes	1:6 slope down, 15' wide minimum to 1:4 slope up, 5' wide minimum to 1:2 slope up	1:6 slope down, 15' wide minimum to 1:4 slope up, 5' wide minimum to 1:2 slope up
CROSS SLOPES	Maximum 8% - Minimum 2%	Maximum 8% - Minimum 2%	Maximum 6% - Minimum 2%	Maximum 6% - Minimum 2%	Maximum 8% - Minimum 2%	Maximum 8% - Minimum 2%	Maximum 6%, Minimum 2%	Maximum 8%, Minimum 2%
VERTICAL GRADES	0.5% Minimum - 4% Maximum	0.5% Minimum - 7% Maximum	0.5% Minimum - 5% Maximum	0.5% Minimum - 9% Maximum	0.5% Minimum - 7% Maximum	0.5% Minimum - 9% Maximum	0.5% Minimum 10% Maximum	0.5% Minimum 10% Maximum
HORIZONTAL CURVATURE	R= 1200' @ 8% Superelevation	214' (30 MPH) to 758' (50 MPH) @ 8% Superelevation	R= 485' @ 6% Superelevation	R= 340' @ 6% Superelevation	R= 758' @ 8% Superelevation	R= 314' @ 8% Superelevation	R= 231' @ 6% Superelevation	R= 214' @ 8% Superelevation
SIGHT DISTANCE (MINIMUM STOPPING)	570'	200' (30 MPH), 425' (50 MPH)	305'	250'	425'	250'	200'	200'
DESIGN VEHICLE	WB -62*	WB -62*	WB-62*	WB-62*	WB-62*	WB-62*	TBD	TBD
MEDIAN WIDTHS	18' Minimum to 36' Maximum (Includes 2' barrier)	10' Minimum for 2-Way Ramps	n/a	n/a	n/a	n/a	n/a	n/a

Sources: AASHTO, *A Policy on Geometric Design of Highways and Streets* (7<sup>th</sup> Edition, 2018) (also known as the AASHTO Green Book)  
 PennDOT, *Publication 13 Design Manual Part 2 Highway Design* (March 2024)  
 \*WB-62 is semi-trailer vehicle with a 48' trailer.

The alternative LOD was expanded in the proposed PA 45 and PA 144 interchange areas to include additional potential impact areas associated with ramps and local roadway adjustments. Where a Build Alternative alignment overtopped the existing 322 corridor, a two-lane Local 322 roadway was added adjacent to the Build Alternative alignment to provide the necessary local road network connectivity. The LOD was adjusted in these areas to include the Local 322 roadway and local road improvements required to complete the specific alternative alignment. The LODs were also adjusted to incorporate conceptual stormwater management facilities and associated access roads, potential maintenance crossover locations, substitute right-of-way (ROW) for potential utility relocations, and township road or driveway extensions needed to maintain property access. The LOD was presented on exhibits and used when determining surface impacts.

Currently, each Build Alternative uses a common baseline both horizontally and vertically for each direction of travel. As the study advances and the number of alternatives is reduced, more detailed engineering will be performed. The detailed engineering could involve using independent baselines for each direction, bifurcating the vertical alignments, or using asymmetrical curvature to further reduce the overall alignment footprint and associated impacts.

## Local 322

In addition to the new four-lane, limited access expressway, a Local 322 two-lane roadway, will also be provided from PA 45 to the Potters Mills Gap interchange at PA 144. In areas where the existing roadway is overtopped by the footprint of the proposed expressway, a new roadway will be constructed. In areas outside the footprint, the existing roadway will remain intact. Local 322 will also function as the alternate route in the event of an incident on the new US 322 expressway. The typical section for new portions of Local 322 and other proposed local road improvements are indicated in **Figure 2A** and **Figure 2B**.

Since the majority of the traffic currently using existing US 322 will be shifted to the new US 322 expressway, the functional classification of Local 322 will be modified. The section of road from PA 45 to Bear Meadows Road will be reclassified as a Major Collector (Urban) and from Bear Meadows Road to PMG will be a Minor Collector (Rural). The design speed for the reconstructed sections will be 50 mph.

## Structures

Bridge structures were included for each Build Alternative alignment based on an initial assessment of topography, features, and local roadway network connectivity. Specifically, this assessment reviewed the feature being crossed (e.g., waterway, resource, local roadway) and the feasibility of bridging the feature in a reasonable manner. For local roads, the availability of other side road crossings and associated roadway network connectivity was considered as the

ability to provide the required vertical clearance. Structures were also proposed or modified in sensitive resource areas to lessen impacts to streams, floodplains, and wetlands. Where practical, structures would be modified to provide wildlife crossings. Other structures, such as retaining walls, noise walls, or box culverts, have not been thoroughly investigated at this time. These features will be considered when more detailed engineering is performed.

## Order of Magnitude Cost Estimates

An approximate cost-per-foot of Build Alternative alignment estimate was developed to compare order-of-magnitude initial construction cost for each alternative. The calculations and assumptions used to derive these costs were presented in the PEL study and updated in 2025 to reflect current unit prices. The per foot cost includes the following items:

- Mainline Travel Lane pavement
- Shoulders
- Paved or grass median
- Drainage system – including inlets, pipe, and pavement base drain
- Seed, mulch, and Stormwater management features
- Guide rail and R/W Fence
- Signing, Pavement markings and delineators

The length of each corridor (minus structure length) was multiplied by the per foot cost for each condition of roadway (mainline, interchange ramp, local road improvements, paved or grass median, etc.) to determine a base construction cost for each alternative. Structure costs, based on approximate bridge deck area, were estimated and added. Earthwork cost was based on the proposed template superimposed on the existing ground surface and measuring the volume of excavation (cut) or embankment (fill) as generated from the digital terrain model. A higher unit cost was used for the cost of borrowing material from an off-site source. Once this subtotal was determined, uniform percent of construction cost adjustments were applied for Erosion Control, Mobilization, and Traffic Control.

**Table 2** outlines the items and current unit prices used as a basis for the order of magnitude cost estimate. The range of costs were then determined by applying an inflation factor of 3% to 7% per year, extending to the anticipated construction year of 2031.

**Table 2 – Engineering Unit Costs**

Element	Cost	Unit
<b>Roadway</b>		
Mainline with Grass Median	\$1,705	LF
Mainline with Paved Median	\$1,935	LF
Ramps	\$700	LF
Arterials	\$700	LF
Local Roads	\$500	LF
Shared Use Path	\$100	LF
<b>Earthwork</b>		
Excavation (Soil / Rock)	\$15	CY
Foreign Borrow Excavation	\$20	CY
<b>Structures/Bridges</b>		
Bridge (Span Length 0'-99')	\$500	SQFT
Bridge (Span Length 100'+)	\$350	SQFT
Box Culverts	\$9,100	LF
<b>Utilities</b>		
Gas Line	\$3,000	LF
<b>Percentage Based Items</b>		
E&S	3%	NA
Mobilization	8%	NA
MPT	5%	NA

*Note: Does not include costs for potential mitigation*

All three of the alternatives cross and impact the existing gas lines to the west of Taylor Hill Road. To account for these impacts and their associated relocation costs, a cost per linear foot of impact was also included in the construction estimate

PennDOT conducted a preliminary investigation to determine an estimated ROW cost for each of the Build Alternative alignments. These estimates considered residential and commercial relocations and partial land acquisition, geography of the relocations, current market averages in the geographies, and potential mineral right losses. As the proposed Build Alternatives only have conceptual engineering and full ROW plans have not been developed, this planning-level ROW analysis provides a baseline cost for comparing the Build Alternative alignments for use in the Environmental Impact Statement.

## Alternative Alignment Development

Three of the US 322 Build Alternatives corridors were recommended in the PEL Study to move forward into the NEPA phase of the project: US 322-1 OEX, US 322-1 South, and US 322-5. Utilizing the templates previously discussed, specific alignment alternatives were developed and were named the North, Central, and South Alternatives.

### Overview of PEL Build Alternative Corridors

The Build Alternative alignments are based on the recommended three PEL Build Alternative corridors advanced for further development and evaluation. The following provides a high-level overview of these corridors.

#### US 322 - 1OEX Build Alternative Corridor

US 322-1OEX was developed as a hybrid of US 322-1S that attempted to maximize the use of the existing US 322 ROW. US 322-1OEX had logical termini at US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap (**Figure 3**). US 322-1OEX began at the existing US 322 interchange with PA 45 near Boalsburg and followed existing US 322 to a point east of the Elks Club Road/Bear Meadows Road intersection. In this area, a new roadway section for Local 322 was provided on the north side of the limited access highway to provide connectivity to the local road network. US 322-1OEX shifted off existing US 322 to the north until it crossed US 322 near Neff Road in Tusseyville. An interchange with a connector road between PA 45 and US 322 was proposed near Iron Horse Lane and the Harley Davidson Center but was removed following the PEL Study as noted in the Introduction section of this Memorandum. Near Neff Road, US 322-1OEX followed existing US 322 to the recently constructed US 322/ PA 144 interchange at Potters Mills Gap, with the inclusion of a new section for Local 322 to maintain local access for properties adjacent to the new limited access facility. US 322-1OEX would be 8.3 miles long. US 322-1OEX provides the foundation for the *North Alternative*.

#### US 322-1S Build Alternative Corridor

US 322-1S had logical termini at US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap. US 322-1S began at the existing US 322 interchange with PA 45 near Boalsburg and followed existing US 322 to a point east of the Elks Club Road/Bear Meadows Road intersection. In this area, a new roadway section for Local 322 was provided on the north side of the limited access highway to provide connectivity to the local road network (**Figure 3**). US 322-1S then shifted off existing US 322 to the north until it crossed south over US 322 near Neff Road in Tusseyville. An interchange with a connector road between PA 45 and US 322 was proposed near Iron Horse Lane and the Harley Davidson Center but was removed following the PEL Study as noted in the Introduction section of this Memorandum. The alternative would parallel US 322 to the south before connecting to the recently constructed US 322/PA 144 interchange at Potters

Mills Gap. The Build Alternative US 322-1S would be 8.3 miles. US 322-1S provides the foundation for the *Central Alternative*.

## US322-5 Build Alternative Corridor

US 322-5 had logical termini at US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap. US 322-5 began at the existing US 322 interchange with PA 45 near Boalsburg and followed existing US 322 to a point east of the Elks Club Road/Bear Meadows Road intersection (**Figure 3**). A new roadway section for Local 322 roadway on the north side of the limited access highway provided connection to the local road network. US 322-5 then turned southeast off existing US 322 corridor near Tait Road and proceeded east along the lower slope of Tussey Mountain, paralleling US 322. An interchange was proposed near Taylor Hill Road with a connection to existing US 322 but was removed following the PEL Study as noted in the Introduction section of this Memorandum. The corridor then paralleled US 322 to the south crossing over Church Hill Road, Dogtown Road, and Red Mill Road and connected to the recently constructed US 322/PA 144 interchange at Potters Mills Gap. US 322-5 would be 8.4 miles long. US 322-5 provides the foundation for the *South Alternative*.

## Initial Build Alternative Alignment Development

The following section documents the evolution of the PEL Study Build Alternative corridors into the initial North, Central, and South Build Alternative alignments. These alternatives were advanced for public review and will be fully evaluated in the Environmental Impact Statement. The alternatives have all been refined into alignments that:

- Minimize impacts to environmental resources including farmland, residential and commercial properties, historic structures, wetlands and waterways.
- Address public and resource agency comments received during the PEL Study
- Include revised cut/fill limits based on updated vertical alignments
- Incorporate structure layouts to maintain local roadway connections, provide access, wildlife passage, and specifically minimize stream/wetland impacts

### North Alternative Development

The North Alternative, derived from the PEL US 322-1OEX Build Alternative Corridor, begins just west of the existing Potters Mills Gap (PMG) interchange and extends along existing US 322 for 2.4 miles to the Tusseyville Road area. Between the PMG interchange and Tusseyville Road, the new highway was modified from the PEL corridor to widen to the north and crosses Sinking Creek and its tributaries. Existing 322 will be converted to a local road running parallel to the new highway and provide (or maintain) the connections and access to other local roads including Red Mill/Mountain Back, Dogtown, Church Hill and others. At Tusseyville Road, the North Alternative veers north off the existing 322 corridor for approximately 4 miles crossing Neff and Wagner Roads, and the Harris/Potter Township Line. The alternative then turns back toward the existing 322 corridor crossing Sharer Road and Spring Creek and returns to the existing US 322 corridor

near Somerset Drive. From Somerset Drive, the new highway alignment widens along the south side of the existing 322 corridor and connects to the Mount Nittany Expressway at the PA 45 partial interchange. The existing PA 45 interchange would be replaced with a full-access interchange (**Figure 4**).

The North Alternative had three key modifications from the PEL corridor. The first is that the PEL corridor was centered along the existing 322 corridor in the east, but the North Alternative was shifted further north to minimize farmland impacts along the south side of the existing 322 corridor. The second modification is its departure location from the existing US 322 corridor. The North Alternative curved further north from the existing 322 corridor at Tusseyville. This modification stays north of the main Kerr property before turning to parallel existing 322. This shift was necessary to minimize impacts on the Kerr farm operations but does have a greater impact on the Tusseyville Historic District. The third modification was the removal of the PA 45 Connector and interchange. Additionally, emergency median crossovers were added at approximately 2-mile intervals. Additional connections providing access from existing US 322 were also provided where prudent and reasonable for maintenance and emergency service access to the new expressway.

#### Central Alternative Development

The Central Alternative, derived from the PEL US 322-1S Build Alternative corridor, begins just west of the existing Potters Mills Gap interchange and extends generally along the existing 322 corridor for 2.4 miles through the Tusseyville area. Between the PMG interchange and Tusseyville Road, the new highway expands the existing corridor to the south and crosses Mountain Back, Dogtown, and Church Hill Roads, Chopper Lane, and Sinking Creek streams. West of the Tusseyville area, instead of turning north like the previously discussed North Alternative or the US 322 1 South PEL Alternative, the Central Alternative remains south of the existing 322 corridor and passes through the Potter Township Athletic Complex while crossing Taylor Hill and Tussey Sink Roads, and Tussey View Lane before turning northward and crossing over existing US 322, the Harris/Potter Township line, Spring Creek, and Sharer Road. The alternative then turns back toward US 322 before merging with the existing 322 corridor near Somerset Drive. The Central Alternative then proceeds on a similar path to the North Alternative to the proposed interchange at PA 45. Additional connections providing access from the existing US 322 corridor were also provided where prudent and reasonable for maintenance and emergency service access to the new expressway (**Figure 5**).

This alternative has three key modifications from the PEL corridor. The first is that the PEL corridor was further south of existing 322 in the east, but the current alignment shifts further north to minimize impacts to the Chad Cole and Darlington farm operations south of US 322. The next key modification is that the Central Alternative remains south of existing 322 for a longer distance than was proposed in the PEL study. This modification was developed to provide for a minimization of impacts on farm operations and based on coordination with local officials. The third modification was the removal of the PA 45 Connector and interchange. Additionally,

emergency median crossovers were added at approximately 2-mile intervals. Additional connections providing access from existing US 322 were also provided where prudent and reasonable for maintenance and emergency service access to the new expressway.

## South Alternative Development

The South Alternative, derived from the PEL US 322-5 Build Alternative corridor, begins just west of the existing Potters Mills Gap interchange and extends along the existing 322 corridor for 2.4 miles through the Tusseyville area. Between the PMG interchange and Tusseyville Road, the new highway is generally located on the existing 322 corridor with a local road paralleling the facility to the north. The new highway crosses Sinking Creek and its tributaries while providing local connections and access to Red Mill, Mountain Back, Dogtown, Church Hill Roads, and Chopper Lane.

West of the Tusseyville area, the South Alternative veers southward around the Potter Township Athletic Complex, and crosses Taylor Hill and Tussey Sink Roads and the Harris/Potter Township line. The alternative then begins to turn northward crossing Coxey Lane before it returns to the existing 322 corridor near Somerset Drive. From Somerset Drive, the South Alternative proceeds on a similar path to the North and Central alternatives to the proposed interchange at PA 45.

This alternative had two key modifications from the PEL corridor. The PEL corridor was further south of the existing 322 corridor in the east, but the current alignment shifts further north to minimize impacts to Chad Cole, Darlington, and Patrick Cole farm operations south of existing 322. The second modification was the removal of the midpoint interchange. Additionally, emergency median crossovers were added at approximately 2-mile intervals. Additional connections providing access from existing US 322 were also provided where prudent and reasonable for maintenance and emergency service access to the new expressway (**Figure 6**).

## Other Alternative Considerations

### *Local 322 at Western End of Project*

Two options were investigated regarding the new Local 322 alignment at the western end of the project. One option transitioned the two-lane road under the new expressway to connect to Boal Avenue, similar to the alignment of the existing westbound off-ramp to Atherton Street. The other option was to extend Local 322 across a new structure over Spring Creek to connect with existing PA 45 on the east of the existing interchange. After discussions with PennDOT maintenance personnel, as well as Harris Township officials, it was determined that this connection was extremely beneficial for maintenance operations. While it does create the need for an additional structure, it greatly reduces the traffic volumes on Boal Avenue and provides convenient access for snow removal and other highway maintenance activities. In addition, without the connection to PA 45, more traffic would likely be diverted from the Local 322 to Elks Club Road and along PA 45 to access the interchange.

The extension of the Local 322 from the PennDOT maintenance facility to PA 45 creates a new intersection north of the PA 45 interchange. Two options to control the intersection were

investigated: a single lane roundabout and a T-intersection with a new traffic signal system and exclusive turn lanes. Both options would perform effectively, operating with acceptable levels of service and delay. However, the roundabout option is proposed as it requires less ROW and provides operational and safety advantages. The proposed roundabout was positioned to provide adequate separation from the interchange area while also maintaining access to residential properties along PA 45. If a traffic signal is installed, traffic queues on the westbound PA 45 approach will likely extend across multiple residential driveways making ingress and egress to these properties difficult, particularly during peak hours.

### *Interchange Options Evaluated*

Interchanges at the west (Mt. Nittany Expressway (US 322)/PA 45) and east (US 322 at Potters Mills Gap) termini would be the same for any of the Build Alternative alignments. The following documents the interchange options developed, evaluated, and advanced for inclusion in the project.

#### US 322/PA 45 Interchange Options Considered

Multiple interchange options were considered to provide a full access interchange between the new US 322 expressway and PA 45. All options include additional lanes on PA 45 from Boal Avenue to the interchange. The interchange options considered include:

*Conventional Diamond:* This option was to add an eastbound on ramp and westbound off ramp that opposed the two existing ramps to form a conventional diamond interchange configuration. In this option, PA 45 would be expanded to five lanes: two through lanes in each direction plus a center left turn lane. Traffic signals would be used at each of the ramp intersections. This option also included an unsignalized T-intersection connection of Boal Avenue under the new expressway connection to a new Local 322 roadway. This option had a significant encroachment on the income restricted, multi-unit residential neighborhood on Ashworth Lane. To eliminate the impact on these housing units, the eastbound on-ramp was moved to Boal Avenue, at a similar location to the existing configuration. This option is shown in **Figure 7**.

*Tight Urban Diamond with Signal Control:* This option incorporated a mainline shift in the alignment away from the income restricted, multi-unit housing development and also positioned the ramps closer to the mainline. The existing ramps would be reconstructed on new alignment. PA 45 would be widened to six lanes under the expressway, with two through lanes and a dedicated left turn lane in each direction. Traffic signals would be used at each of the ramp intersections. This option also included an unsignalized T-intersection connection of Boal Avenue under the new expressway connection to a new Local 322 roadway. This option is shown in **Figure 8**.

*Single Point Urban Interchange:* This option incorporated a mainline shift in the alignment away from the income restricted, multi-unit housing development similar to the tight diamond option. The four ramps would be constructed on new alignment and connect

with PA 45 at a single, signalized intersection. PA 45 would be widened to five lanes under the expressway, with two through lanes and a dedicated left turn lane in each direction. Local 322, a new two-lane service road, would extend to PA 45 where a single-lane roundabout is proposed. A new, unsignalized T-intersection connection of Boal Avenue under the new expressway connection to a new Local 322 roadway. Single point urban interchange would provide approximately 700 feet of separation to the roundabout at the PA 45/Local 322 intersection. This option is shown in **Figure 9**.

*Tight Urban Diamond with Roundabouts:* This option incorporated a mainline shift in the alignment away from the income restricted, multi-unit housing development and also positioned the ramps close to the mainline. The existing ramps would be reconstructed on new alignment. PA 45 would be widened to four lanes under the expressway, with two through lanes in each direction. Single lane roundabouts with bypass lanes would be used at each of the ramp intersections. The westbound ramp roundabout would only provide approximately 400 feet of separation to the PA 45/Local 322 intersection. This distance is inadequate to accommodate the volume of traffic entering the westbound on ramp toward State College. The queue length in this direction would extend through the roundabout at the adjacent PA 45/Local 322 intersection, adversely impacting its performance. This option is shown in **Figure 10**.

*Diverging Diamond:* A diverging diamond was conceptually considered but dismissed from further development due to geometric challenges and unbalanced traffic flows which adversely impact the operational performance of the signals. The PA 45/Local 322 intersection is within 500 feet of the westbound interchange ramps, impacting the ability to safely complete the crossover movement for PA 45 traffic. Realignment of the Local 322 to the north to accommodate the crossover movement results in increased impacts on farmlands and other sensitive environmental features, while also adversely affecting residential properties along westbound PA 45.

*US 322/PA 45 Interchange Summary:* As outlined in the *Traffic Analysis Technical Memorandum*, concern with potential operational issues as a result of vehicle queuing on PA 45 between the US 322 interchange ramp intersection(s) and the Local 322 intersection was noted. Therefore, a comparison of the operational results for combinations of interchange and intersection types was made (e.g., Tight Urban Diamond Interchange with Traffic Signal control at the Local 322 connector road, SPUI Interchange with Roundabout control at the Local 322 connector road, etc.) which indicates that a roundabout at the Local 322 connector road intersection combined with the SPUI Interchange Alternative would result in the least amount of peak hour queuing. This interchange scenario is being advanced for further analysis. During future detailed design studies, should additional analysis determine another interchange scenario would be preferred, the various interchanges scenarios all fit within the current LOD.

## US 322/PMG Interchange Options Considered

Three interchange options were investigated at the PMG Interchange. An important consideration when developing the options was future traffic demand. With the new expressway completed, the anticipated Average Daily Traffic (ADT) for the westbound on ramp to US 322 is approximately 2,000 vehicles per day. The ADT on the existing 322 corridor is approximately 1,000.

*T-Intersection:* This alternative removed the existing roundabout and utilized a T-intersection with Local 322. The T-intersection would be within 150 feet of the westbound ramp intersection. The removal of the existing roundabout would address negative feedback received from the local community. However, the closeness of the intersections presents an operational concern with vehicle queuing. The T-intersection also impacts the properties and driveways on the north side and reduces traffic operations and complicates detour signing for incidents (**Figure 11**).

*Maintain Roundabout with Local US 322 as Through Movement:* This alternative maintained the northwest leg of the existing roundabout as the through movement for local access with the US 322 westbound on-ramp intersecting with the local access road. This alternative preserves the existing roundabout, lessens the impacts to the properties on the north side, and maintains existing access to the driveways on the north side. However, it favors the traffic flow for the local road rather than the heavier volume, ramp movement (**Figure 12**).

*Maintain Roundabout with Ramp as Predominant Movement:* This alternative maintained the northwest leg of the existing roundabout as the predominant movement for the US 322 westbound on ramp with the local access teeing from the ramp similar to the current Skyview Drive intersection. This alternative preserves the existing roundabout, creates the least impacts to the properties on the north side, and maintains existing access to the driveways on the north side. This alternative has the least impact (**Figure 13**).

*US 322/PMG Interchange Summary:* The T-intersection impacts additional properties and driveways and creates an operational concern due to the closeness of the T-intersection and westbound ramps intersection. Maintaining the roundabout with existing 322 as the through movement favors the traffic flow for the local road rather than the heavier, ramp movement. Maintaining the roundabout with the westbound ramp as the predominant movement better accommodates the future anticipated ramp traffic. This alternative also has the least overall impact of the options considered and was advanced for further consideration.

### *Common Western End Alignment Development*

During the PEL Study, the western portion of the three recommended Build Alternative corridors extended from the project terminus of US 322 (Mt. Nittany Expressway) to just east of the Elks Club Road/Bear Meadows Road intersection with US 322 and shared a common footprint.

Maintaining this alignment best utilized the existing ROW footprint to the greatest extent possible and minimized impacts to the residential and commercial properties in the area. The corridors held the northern ROW line and extended as far south towards the mountain as necessary. Overall, this footprint uses legal ROW with minimized effects to residential and commercial properties including multi-unit residential dwellings, streams and natural resources, farmland, and was most favorable to local officials and the public. As such, each of the North, Central, and South Alternatives share the same highway alignment through this area.

Several special design considerations had to be made to provide for local access from Boal Avenue to Bear Meadows Road. In addition, local requests to improve bicycle and pedestrian access in this area were received and the design was adjusted to address this request. These topics are discussed in more detail in the following sections. In addition, storm water management facilities and individual property access were developed throughout this section as outlined above in the methodology section. Overall, attempts to minimize impacts, balance earthwork, and improve traffic operations through this area are identical across all alternatives.

#### *Addition of Independent Shared-Use Path*

Stakeholders and public input received on the project expressed desire to account for pedestrian and non-motorized traffic as a part of the project. As such, accommodations to enhance safety and functionality for pedestrians and cyclists were incorporated into the design. Near Boalsburg, a separate, paved shared-use path is proposed along Local 322 from the newly created T-intersection with Boal Avenue extending east to Elks Club Road. The path would also extend along Boal Avenue to its intersection with Discovery Drive. In addition, 10-foot shoulders along the new Local 322 roadway from PA 45 to Boal Avenue have been provided to accommodate bicycle traffic as well. **Figure 14** depicts a typical section for this portion of the local roadway along with a rendering of the multi-use trail. The new shared-use path may be constructed as part of the project once a maintenance agreement is executed between Harris Township and PennDOT.

#### **Build Alternative Alignment August 2024 Revisions**

An open house public meeting was held August 15, 2024. The meeting was used to present the work efforts that had been completed since the PEL Study conclusion, including a revised purpose and needs, detailed environmental mapping, and refinement of the PEL corridors into specific alignments. The team collected comments and information from the public regarding the alignment locations, local access, private access, and known environmental concerns in the area. Following the August public meetings, a field view was conducted in October 2024 with various resource agencies during which the team collected additional information on areas of concern and potential alignment refinements.

With the information collected on the initial North, Central, and South Alternatives, the alternatives were further refined and changes were made to further avoid and minimize the

potential for impacts. The following sections outline the modifications that were made for each of the alternatives and other combined alternative considerations.

#### North Alternative Alignment Modification

The mainline alignment was shifted to the south and west through previously avoided farmlands to limit the number of residential impacts in the Tusseyville area and homes located off Swan Lane. It was confirmed with Mr. Kerr this modification would still minimize impacts to his farming operation. These modifications are shown in **Figure 15**.

#### Central Alternative Alignment Modifications

From Laurel Meadow Lane to just west of Tusseyview Lane, a permanent realignment of Local 322 was made. The realignment allowed the bridge structure over Local 322 to be moved from Station 285 to Station 295 and be built offline which improves constructability and better facilitates traffic control during construction. The driveway to the Chow property was revised to allow access to the realigned Local 322 (**Figure 16**).

Zerby Road, located off Tussey Sink Road, was extended as an alternate access to the Kuhn farm property. This extension eliminates the need for a shared drive for the Kuhn operation and would also eliminate the need to cross the Hamsher property. It also provides direct access to the Sowers property (**Figure 17**). The drive to the Hamsher property was realigned to an access drive connecting to Local 322 at Station 295 under the proposed bridge (**Figure 16**).

#### South Alternative Alignment Modifications

Between Taylor Hill Road and Church Hill Road, the South Alternative was shifted southward to maintain the existing 322 corridor for local traffic thus eliminating impacts to the Kerr farm operation. A 1200-foot-long bridge was provided to carry the mainline over Taylor Hill Road, Tussey Sink Road, and a wetland complex. A shorter bridge that only spans Taylor Hill Road along with an extension of Tussey Sink Road to connect to Taylor Hill Road was considered but not advanced. This shorter bridge option led to more severe impacts to the Allegar and Cole farm properties and increased wetland impacts. These modifications are shown in **Figure 18**.

#### Other Alternative Considerations

##### *Realignment of Local 322 at Bear Meadows Road*

**Figure 19** shows the initial layout which used the existing US 322 corridor from the PennDOT maintenance facility to Elks Club Road before turning 90-degrees to proceed under the new expressway. Local 322 turns 90-degrees again to continue east on a newly constructed 2-lane road for approximately 2,000 feet before connecting to the existing US 322. The T-intersection concept was originally suggested to reduce travel speeds and to create a short, perpendicular bridge crossing of Bear Meadows Road. After presenting this alignment at the August 2024 public meeting, it was determined that the Local 322 on the south side of the alignment would affect a residential community along Roundhill Road, including one home that had just initiated

construction. Additionally, it was noted that the two T-intersections and associated 90-degree turns would cause issues for truck traffic. While the number of trucks using the 2-lane road would be significantly reduced post-construction, it was noted that that this roadway would need to carry local and regional traffic, including trucks, during construction of the new highway as well as in the future during any closures of the expressway. As a result of these concerns, the design team continued to develop a new scenario that would improve travel mobility in the area.

The new 2-lane Local 322 roadway was adjusted to keep on the north side of the mainline for more than 3,000 feet before crossing under the expressway and reconnecting with existing US 322. This design now effects a portion of the Elks Club Golf Course and requires a 1,100-foot extension to Somerset Drive (**Figure 20**).

To minimize environmental impacts to the golf course and Nittany Meadow Farm property, a long retaining wall was investigated. However, the necessary wall height of 48' presented engineering and long-term maintenance issues. The excessively high wall and close proximity of a local roadway below the mainlines would require the use of a snow fence along the mainline expressway. The wall also introduced a severe skew angle for the proposed bridge crossing which lessened the effectiveness of this approach. Because of these issues, a retaining wall in this area was not advanced for further consideration. **Figure 20** shows the Local 322 roadway that was advanced for the North, Central, and South Alternatives.

### *Special Circumstance Property Access*

While individual property access was handled consistently throughout the alignments, some properties required more detailed analysis to maintain access once the expressway is constructed. In the shared portion of the western alignment, the mainline alignment between the PennDOT Maintenance facility and Jack Mills Road was modified to minimize the effect to the Lipson property, a resource listed on the National Register of Historic Places, as well as a garden location for the "Think We Not Me" community food growing program. By introducing a tangent stretch of highway between two horizontal curves, the alignment was shifted to the north to minimize impacts to the historic property. The vertical alignment was also adjusted to lessen the embankment height and reduce the lateral encroachment onto the property. The Lipson property is bisected by Galbraith Gap Run, with an access drive from Discovery Lane and a second driveway directly accessing existing US 322. The new expressway will sever this driveway from US 322 that accesses the community gardens.

The Galen property located between the Lipson property and Bear Meadow Village also has an existing driveway connecting to Local 322 that will be severed by the new expressway, landlocking the property. A shared driveway, including a culvert to cross Galbraith Gap Run, was developed to access the Lipson gardens fields as well as the Galen property. A proposed stormwater management facility located on the Galen property was also reduced in overall size with maintenance access provided directly from the expressway shoulder. The modified access is indicated in **Figure 21**.

## *Eastern End Alignment Modification*

The initial North Alternative (**Figure 22A**) paralleled the existing 322 corridor on the north side holding the southern ROW line to Dogtown Road with existing US 322 relocated as a two-lane local access road on the north side. The initial Central Alternative (**Figure 22B**) roughly paralleled the existing 322 corridor on the south side from PMG to west of Dogtown Road with existing US 322 relocated as a two-lane local access road on the north between Skyview Drive and just west of Red Mill Road where it ties back into existing US 322. The initial South Alternative (**Figure 22C**) was centered on the existing 322 corridor from PMG to west of Dogtown Road with the existing US 322 realigned as a two-lane local access road running parallel on the north side. These alignment alternatives were presented at the August 2024 public meeting.

Following the public meeting, alternative alignment refinements were made resulting from public comments and field verifications using efforts to avoid and minimize effects to critical resources ultimately resulting in one common alignment on the eastern end from the PMG interchange to just west of Dogtown Road. Refining the eastern end to a single alignment common for all the alternatives achieves the best balance of impacts. These refinements shifted the mainline alignment to the south, closely paralleling the existing 322 corridor similar to the Central Alternative. The local access shifted to the north near the US 322 westbound ramp/Skyview Drive intersection and tied back to the existing 322 corridor at Red Mill Road. Utilizing much of existing US 322 for local access on the eastern end minimizes impacts to wetlands and eliminates the need for new structures through the wetland areas on the relocated Local 322. New mainline structures are provided to accommodate side roads and driveway access and minimize impacts on wetlands. **Figure 22A**, **Figure 22B**, and **Figure 22C** show the revised alternative common to all three alternatives and provide comparative points to highlight the extent to which the alternative shifted for each of the alternatives.

### Additional Alternative Enhancements

The LOD for all alternatives was adjusted to account for enhancements associated with elements of the project that will be included regardless of the specific alternative advanced. These items include proposed stormwater basin locations sized to meet PCSM and E&S requirements, access to private property and farms, and potential locations for gated access to the new limited access facility for both maintenance personnel and Emergency Management Services.

Stormwater management features have been included within the LOD based on a conceptual layout that factored in topography, potential storage requirements, general grading, and potential discharge locations. Initial locations for Points of Analysis (POAs) and Discharge Points (DPs) were determined for Pre- and Post-Construction conditions for project corridor. POAs were set at locations where runoff from the project site reached a named waterway. Boundaries of named waterways were delineated utilizing Hydrologic Unit Code (HUC)-12 boundaries imported from eMAP, a PA Department of Environmental Protection GIS based website and mapping tool that focuses on providing environmental data. DPs were set at each point where concentrated runoff has the potential to leave the PennDOT ROW. POAs were analyzed for pre- and post-

construction conditions to determine the required volume and water quality treatment based on the impacts associated with the proposed alignment. From these initial computations, general sizing for requirements for Stormwater Control Measures (SCMs) were determined and an initial footprint including general grading of maintenance access roads was developed. To account for the preliminary nature of the calculations utilized to determine the initial footprint, the ultimate footprint was increased by 15% to provide a factor of safety. If an alternative footprint created an uneconomic or non-functional remnant land, that land was investigated to determine its potential as a conceptual stormwater management feature. Access drives to these features are also included to accommodate long-term maintenance responsibilities. Access from a local roadway is preferred and has been incorporated, where feasible. If this option was not feasible, access directly from the expressway shoulder would be provided. In either scenario, access drives will be positioned with adequate sight distance and grades that can be traversed with standard maintenance equipment, typically less than 10%.

Revised private access driveways are also provided where the proposed alternatives sever existing access. In these instances, a minimum 12-foot width is indicated, with vertical grades less than 10% used. In each instance, a detailed assessment of existing local roads was considered to determine if a simple driveway realignment or extension would restore effective access. Existing property and ROW lines were reviewed to minimize impacts and avoid uneconomic remnant parcels. In certain instances, a structure that was already proposed to span a stream or other feature was extended to also span the driveway. Township road extensions and shared use driveways were also considered to maintain effective access to all properties.

Maintenance crossovers have also been incorporated into the LOD for each alternative. The spacing and conceptual design were developed in consultation with PennDOT maintenance personnel. Crossovers were placed approximately two miles apart and the LOD expanded to reflect the wider shoulders and median adjustments needed to accommodate snowplows and other maintenance vehicles.

## Build Alternative Alignment July 2025 Revisions

Following the May 2025 public presentation of the Build Alternatives and further environmental analysis, the Central Alternative was shifted to avoid impacting the Potter Township Athletic Complex ball fields, a Section 4(f) property, and minimize impacts on a farm operation. This adjustment would utilize the southern portion of the Potter Township property where no recreational activities occur. In addition, the proposed westbound emergency access to the roadway, which was proposed to connect at Summer Lane, was relocated west, opposite the eastbound emergency access **Figure 23**.

A minor adjustment was also made to the North Alternative at Wagner Road to adjust a stormwater management facility to avoid impacting a historic property that contributes to the Penn Valley/Brush Valley Rural Historic District, a Section 4(f) resource.

No changes were made to the South Alternative following the May 2025 presentation to the public. **Figure 24** outlines the changes to the North and Central Alternatives.

## Alternatives Evaluated in the EIS

The following sections provide an overview of the alternatives to be evaluated in the EIS.

### North Alternative

The North Alternative would tie into the existing four lane divided highway section of the Mount Nittany Expressway (US 322) approximately 1,500 feet west of PA 45 (**Figure 24 – Sheets 1-18**). The North Alternative would then cross over PA 45 and shift slightly east off of the existing 322 corridor to improve the curvature of the roadway. A full interchange would be provided at PA 45 and is currently planned to be a Signal Point Urban Interchange. In this area, a new Local 322 roadway is anticipated to extend from PA 45 to the existing 322 corridor near the PennDOT maintenance facility. Boal Avenue would also be extended to provide a T intersection with Local 322. Along Boal Avenue from Discovery Drive to Local 322 and along Local 322 from the Boal Avenue Extension to Bear Meadows, a shared use path is proposed to improve bicycle and pedestrian travel in this area.

From the PennDOT maintenance facility, the North Alternative parallels existing 322 to the south for nearly 4,800 feet to approximately Bear Meadows Road where it begins to turn north and lie on top of the existing 322 corridor. A newly located Local 322 is provided in this area along with a new T-intersection at Bear Meadows Road to provide a Local 322 connection to the community on the southside of the alternative. Approximately 3,300 feet east of Elks Club Road, the North Alternative follows the existing 322 corridor and then curves to the north near Somerset Drive. The North Alternative bridges the driveway to Nittany Farms and wetlands associated with Spring Creek. Continuing in an easterly direction, the North Alternative wraps around the back of the Kuhn Tree Farm bridging Sharer Road and Spring Creek. It would then continue east through agricultural fields on the north side of existing 322 avoiding impacts to the commercial area on existing 322 in Potter Township. East of Wagner Road the North Alternative passes through the back side of the Kerr farm avoiding the farm buildings and then curves to the south toward Tusseyville. At Tusseyville, the North Alternative bridges Sinking Creek, associated wetlands and the realigned existing 322 before crossing the existing 322 corridor to the south. The North Alternative then closely parallels the existing 322 on the south side once again bridging Sinking Creek, associated wetlands, and Dogtown Road. Approximately 2,400 feet east of Dogtown Road, the North Alternative bridges more wetlands and relocated driveways. Continuing east, the mainline then bridges wetlands and Mountain Back Road before tying back into the existing four lane divided highway section of US 322 at Potters Mills Gap (PMG).

Local 322 shifts to the north at Elks Club Road and ties back to the existing 322 corridor to the west of Tait Road. For approximately 3.4 miles between Tait Road and Neff Road, existing 322 would remain as it is today. At Neff Road, Local 322 is realigned to the north tying back to the

existing 322 corridor just west of Dogtown Road. The existing 322 corridor would once again be utilized for local access for approximately 1.3 miles to Red Mill Road. At Red Mill Road, Local 322 would parallel the mainline on the north side tying to existing 322 west of the PMG roundabout.

The order of magnitude estimated construction cost when projected to the construction year of 2031 ranges from \$661 million to \$831 million.

## Central Alternative

The Central Alternative would tie into the existing four lane divided highway section of the Mount Nittany Expressway (US 322) approximately 1,500 feet west of PA 45 (**Figure 25 – Sheets 1-18**). The Central Alternative would then cross over PA 45 and shift slightly east off the existing US 322 corridor to improve the curvature of the roadway. A full interchange would be provided at PA 45 and is currently planned to be a Signal Point Urban Interchange. In this area, a new Local 322 roadway is anticipated to extend from PA 45 to the existing 322 corridor near the PennDOT maintenance facility. Boal Avenue would also be extended to provide a T intersection with Local 322. Along Boal Avenue from Discovery Drive to Local 322 and along Local 322 from the Boal Avenue Extension to Bear Meadows, a shared use path is proposed to improve bicycle and pedestrian travel in this area.

From the PennDOT maintenance facility, the Central Alternative parallels existing 322 to the south for nearly 4,800 feet to approximately Bear Meadows Road where it begins to turn north and lie on top of the existing 322 corridor. A newly located Local 322 is provided in this area along with a new T-intersection at Bear Meadows Road to provide a Local 322 connection to the community on the southside of the alternative. Approximately 3,300 feet east of Elks Club Road, the Central Alternative follows the existing 322 corridor and then curves to the north near Somerset Drive. The Central Alternative bridges the driveway to Nittany Farms and wetlands associated with Spring Creek. Continuing in an easterly direction, the Central Alternative wraps around the back of the Kuhn Tree Farm bridging Sharer Road and Spring Creek.

Continuing to the east, the Central Alternative turns in a southerly direction and crosses the existing 322 corridor from north to south just east of Bamboo Lane. The Central Alternative continues in an easterly direction through the Potter Township Athletic Field Complex, avoiding impacts to the commercial area of Potter Township. The Central Alternative bridges both Tussey Sink and Taylor Hill Roads and a realigned Tussey Meadow Lane and wetland complex. Continuing in an easterly direction, the Central Alternative bridges over Church Hill Road and then turns slightly north to closely parallel the south side of existing 322 corridor before bridging Sinking Creek, associated wetlands, and Dogtown Road. Approximately 2,400 feet to the east, the Central Alternative bridges more wetlands and relocated driveways. Continuing east, the mainline then

bridges wetlands and Mountain Back Road before tying back into the existing four lane divided highway section of US 322 at PMG.

Local 322 shifts to the north at Elks Club Road and ties back to the existing 322 corridor to the west of Tait Road. The existing 322 corridor would be used for approximately one mile between Tait Road and Laurel Meadow Lane. Local 322 would be realigned to the south tying back to the existing to the west of Tussey View Lane. The existing 322 corridor would once again be used for local access for approximately 4 miles to Red Mill Road. At Red Mill Road, the Local 322 would parallel the mainline on the north side tying to existing 322 to the west of the PMG roundabout.

The order of magnitude estimated construction cost when projected to the construction year of 2031 ranges from \$843 million to \$1.06 billion.

## South Alternative

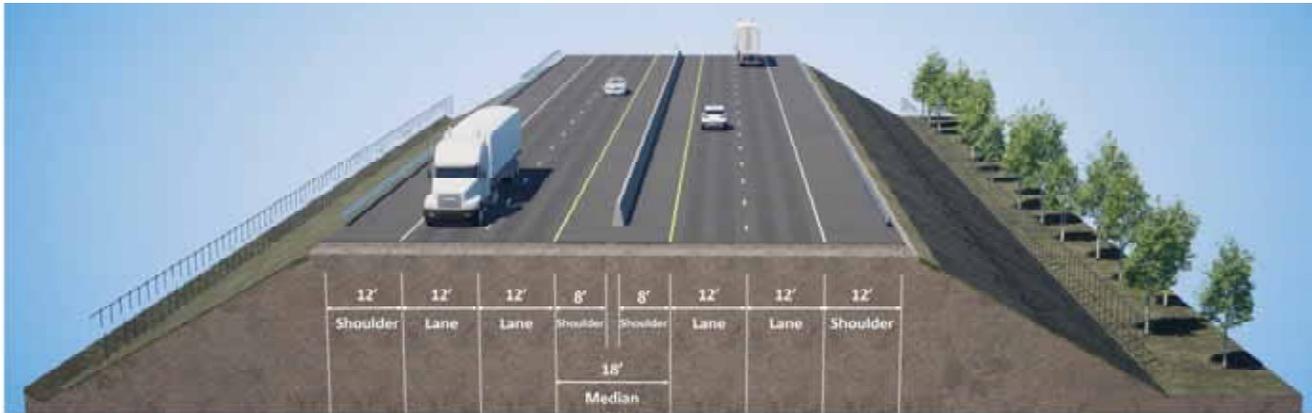
The South Alternative would tie into the existing four lane divided highway section of the Mount Nittany Expressway (US 322) approximately 1,500 feet west of PA 45 (**Figure 26 – Sheets 1-17**). The South Alternative would then cross over PA 45 and shift slightly east off the existing US 322 corridor to improve the curvature of the roadway. A full interchange would be provided at PA 45 and is currently planned to be a Signal Point Urban Interchange. In this area, a new Local 322 roadway is anticipated to extend from PA 45 to the existing 322 corridor near the PennDOT maintenance facility. Boal Avenue would also be extended to provide a T intersection with Local 322. Along Boal Avenue from Discovery Drive to Local 322 and along Local 322 from the Boal Avenue Extension to Bear Meadows, a shared use path is proposed to improve bicycle and pedestrian travel in this area.

From the PennDOT maintenance facility, the South Alternative parallels existing 322 to the south for nearly 4,800 feet to approximately Bear Meadows Road. After Bear Meadows Road, the South Alternative curves south through the Tait Farm and continues east along the side of the Tussey Mountain ridge behind the neighborhoods and communities along the south side of existing 322. Near Tussey View Lane, the South Alternative curves northward staying behind the Potter Township Athletic Field complex and bridging over Tussey Sink and Taylor Hill Roads and a realigned Tussey Meadow Lane and wetland complex. Continuing in an easterly direction, the South Alternative bridges over Church Hill Road and then turns slightly north to closely parallel the south side of existing 322 corridor before bridging Sinking Creek, associated wetlands, and Dogtown Road. Approximately 2,400 feet to the east, the Central Alternative bridges more wetlands and relocated driveways. Continuing east, the mainline then bridges wetlands and Mountain Back Road before tying back into the existing four lane divided highway section of US 322 at PMG.

Local 322 is shifted to the north at Elks Club Road and ties back to the existing 322 corridor to the west of Tait Road. Existing 322 would be utilized the entire length to Red Mill Road. At Red Mill Road, Local 322 would parallel the mainline on the north side tying to the existing 322 corridor to the west of the PMG roundabout.

The order of magnitude estimated construction cost when projected to the construction year of 2031 ranges from \$738 million to \$928 million.

Appendix A – Figures



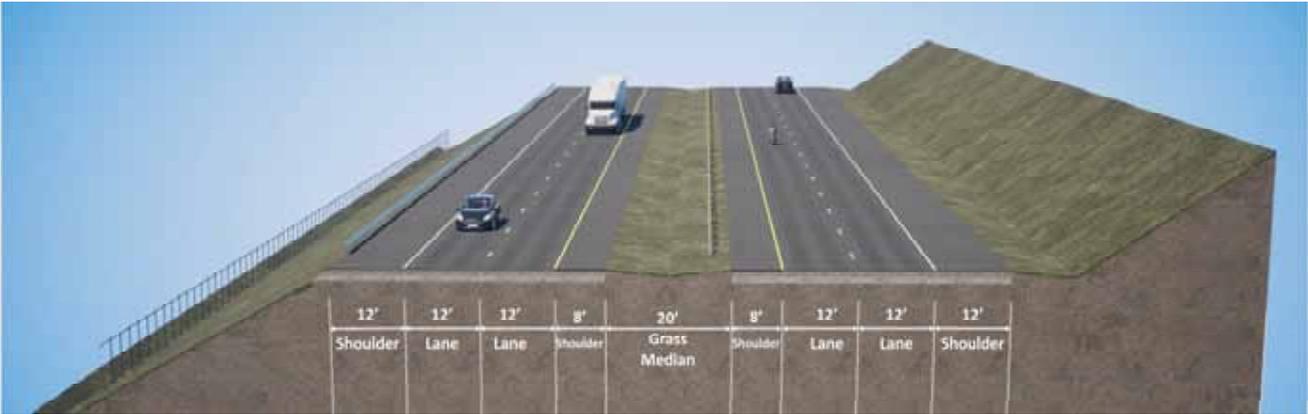
Section used at western and eastern ends of the North, Central, and South Alternatives

Western End: Mount Nittany Expressway to Bear Meadows Road

Eastern End: US 322 at Potters Mills Gap to Tusseyville Area

Section used in the middle portion of the North, Central, and South Alternatives

Middle Area: Bear Meadows Road to the Tusseyville Area

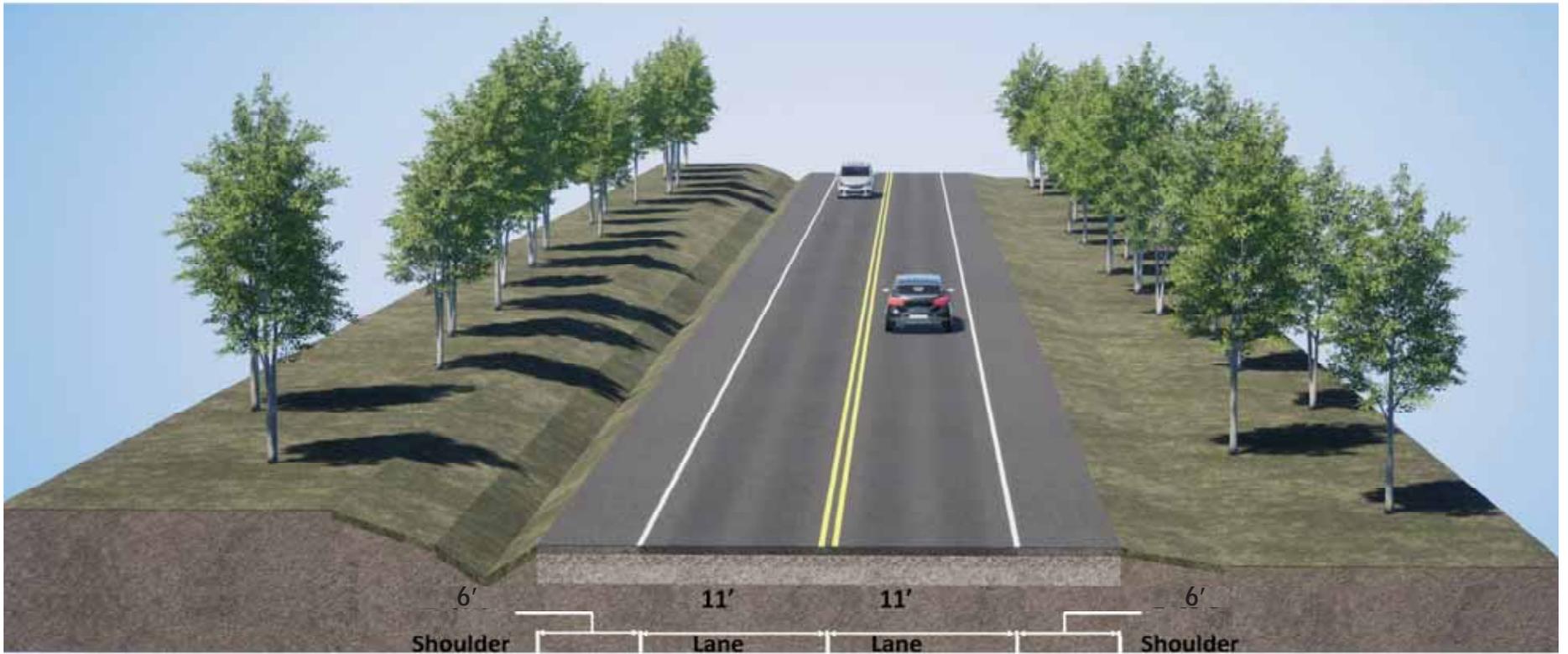


March 2025

Mainline Typical Sections  
Figure 1

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



March 2025

Local 322 Roadway Typical Sections  
Figure 2A

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



Left: Local Road — Rural Typical Section in Harris and Potter Townships



Left: Local Road — Urban Typical Section in Harris Township



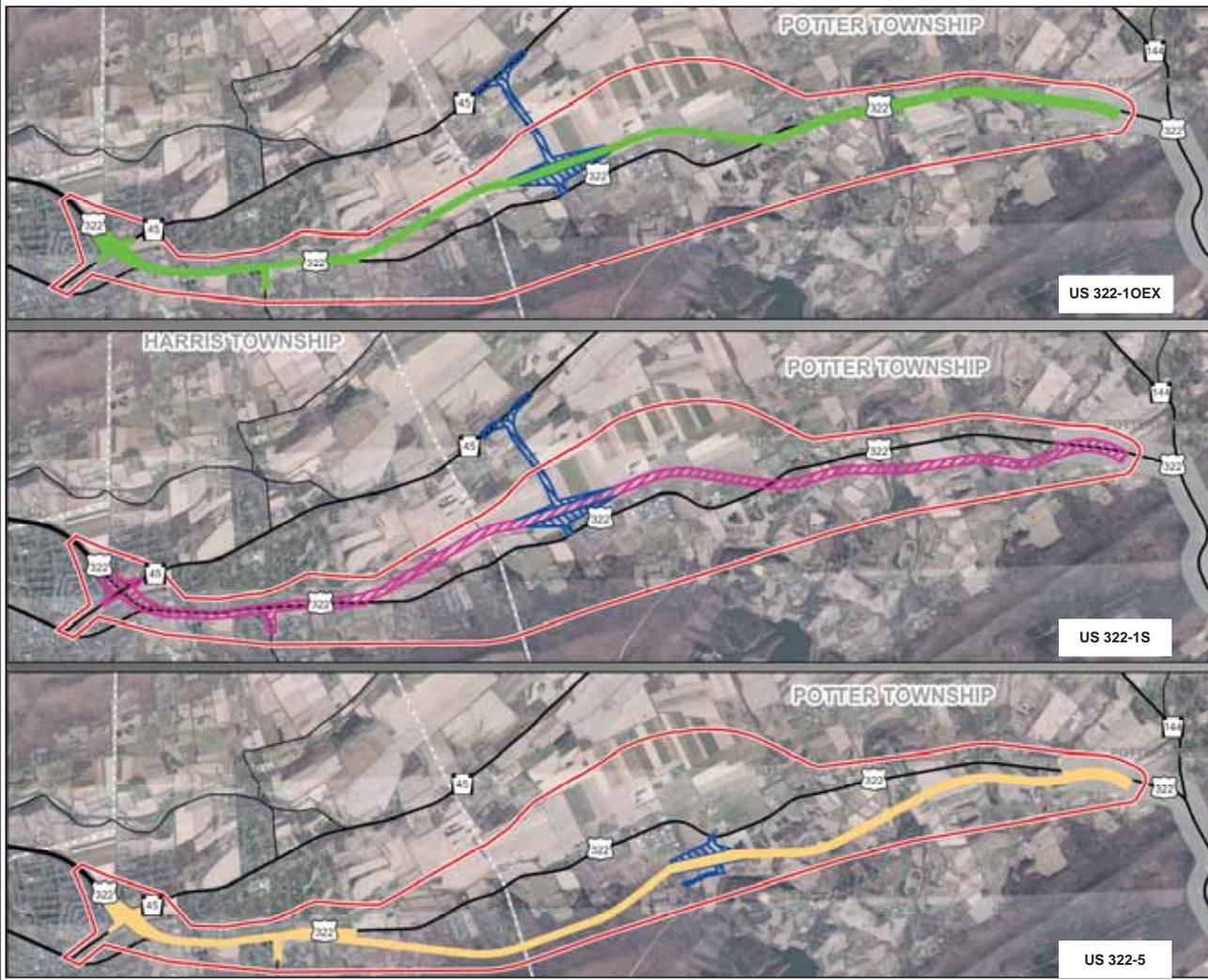
Above: PA 45 Typical Section from Boal Avenue to the proposed SPUI interchange

March 2025

Other Local Roadway Typical Sections  
Figure 2B

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**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



## LEGEND

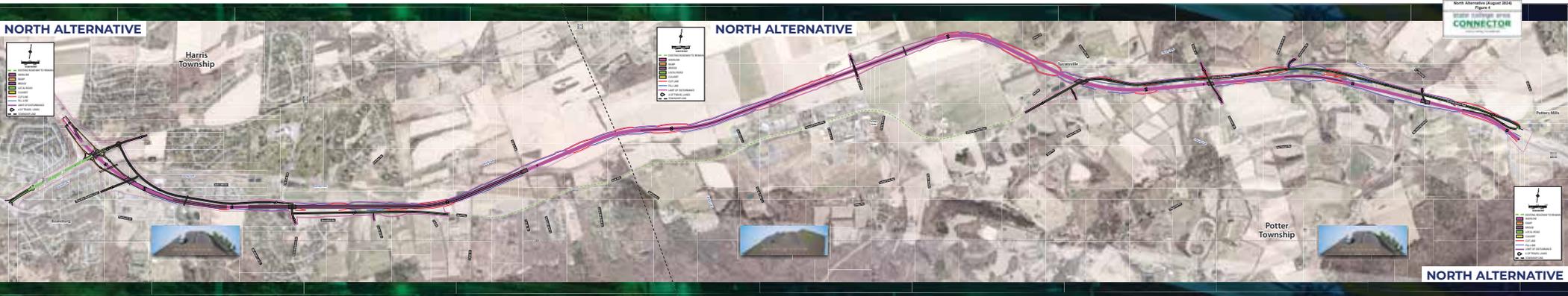
- US 322-10EX
- US 322-1S
- US 322-5
- Potters Mills Gap Transportation Project
- Township
- Municipality/Borough
- Project Area
- PA 45/Connector/Interchange Removed Post-PEL Study



Planning and Environmental Linkages Corridors  
Advanced for Further Study  
Figure 3

# state college area CONNECTOR

State College Area Connector Project  
Centre County, Pennsylvania



**NORTH ALTERNATIVE**







March 2025

Not to Scale

PA 45 Conventional Diamond Interchange  
Figure 7

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



March 2025

Not to Scale

PA 45 Tight Urban Diamond Interchange  
Figure 8

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**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



March 2025  
Not to Scale

PA 45 Single Point Urban Interchange (SPUI)  
with Roundabout for the Local 322 Connection  
Figure 9

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



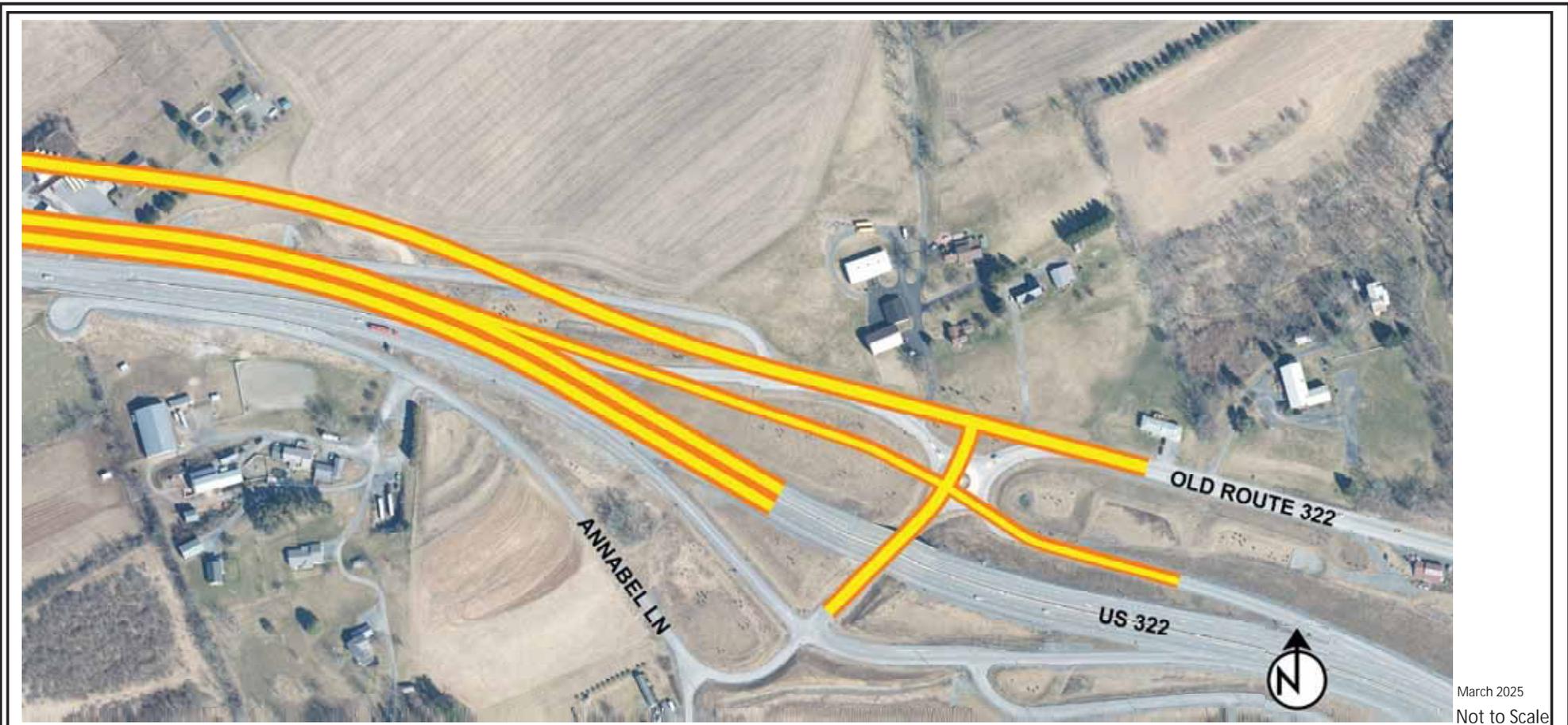
March 2025

Not to Scale

PA 45 Tight Urban Diamond Interchange  
with Roundabouts  
Figure 10

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**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania

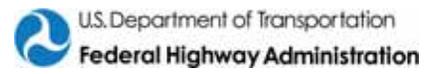


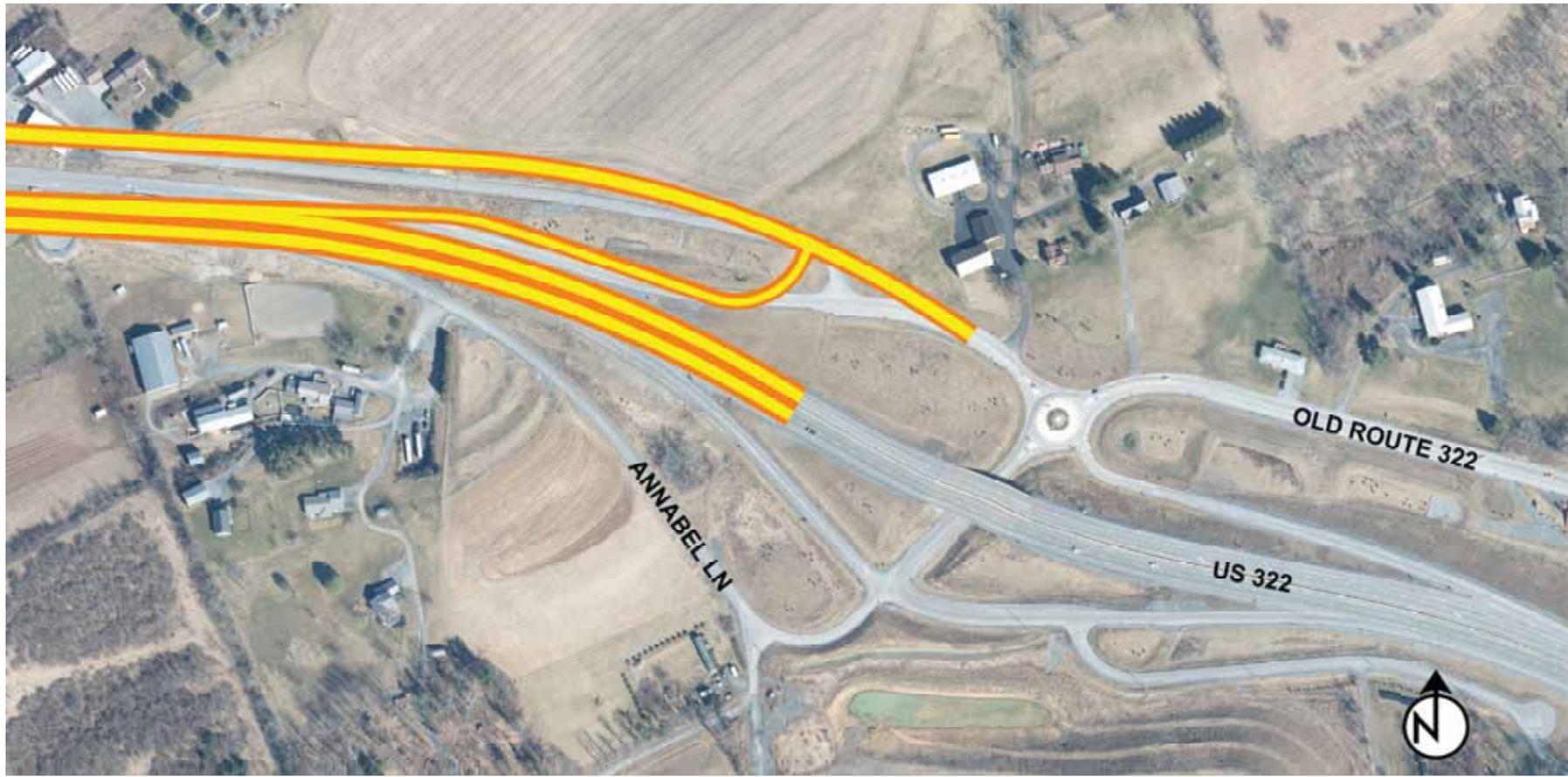
March 2025  
Not to Scale

US 322/PMG Modify Diamond Interchange  
with T Intersection for the Local 322 Connection  
Figure 11

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



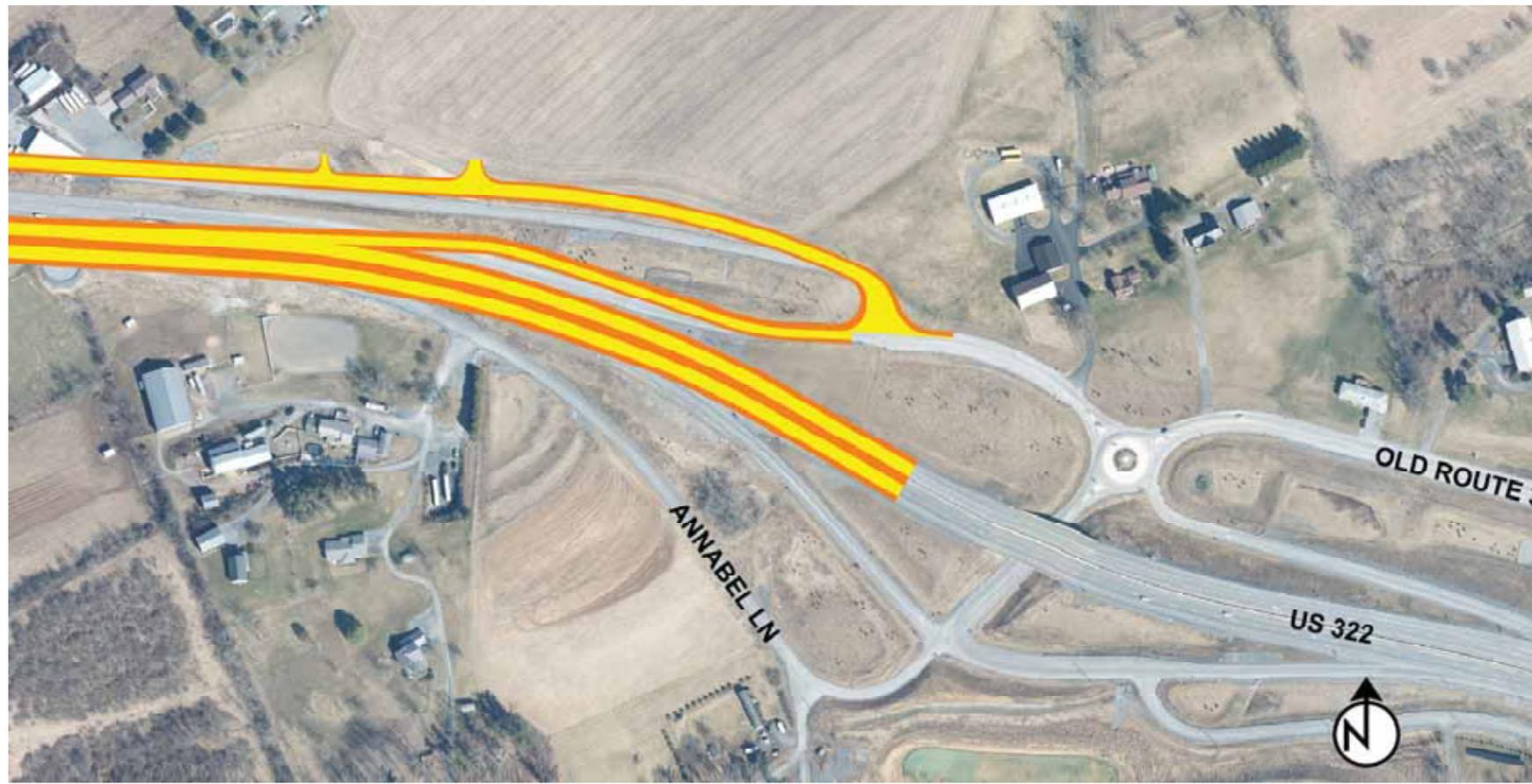


March 2025  
Not to Scale

US 322/PMG Modify Diamond Interchange with  
Roundabout and Local 322 as Through Movement  
Figure 12

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania

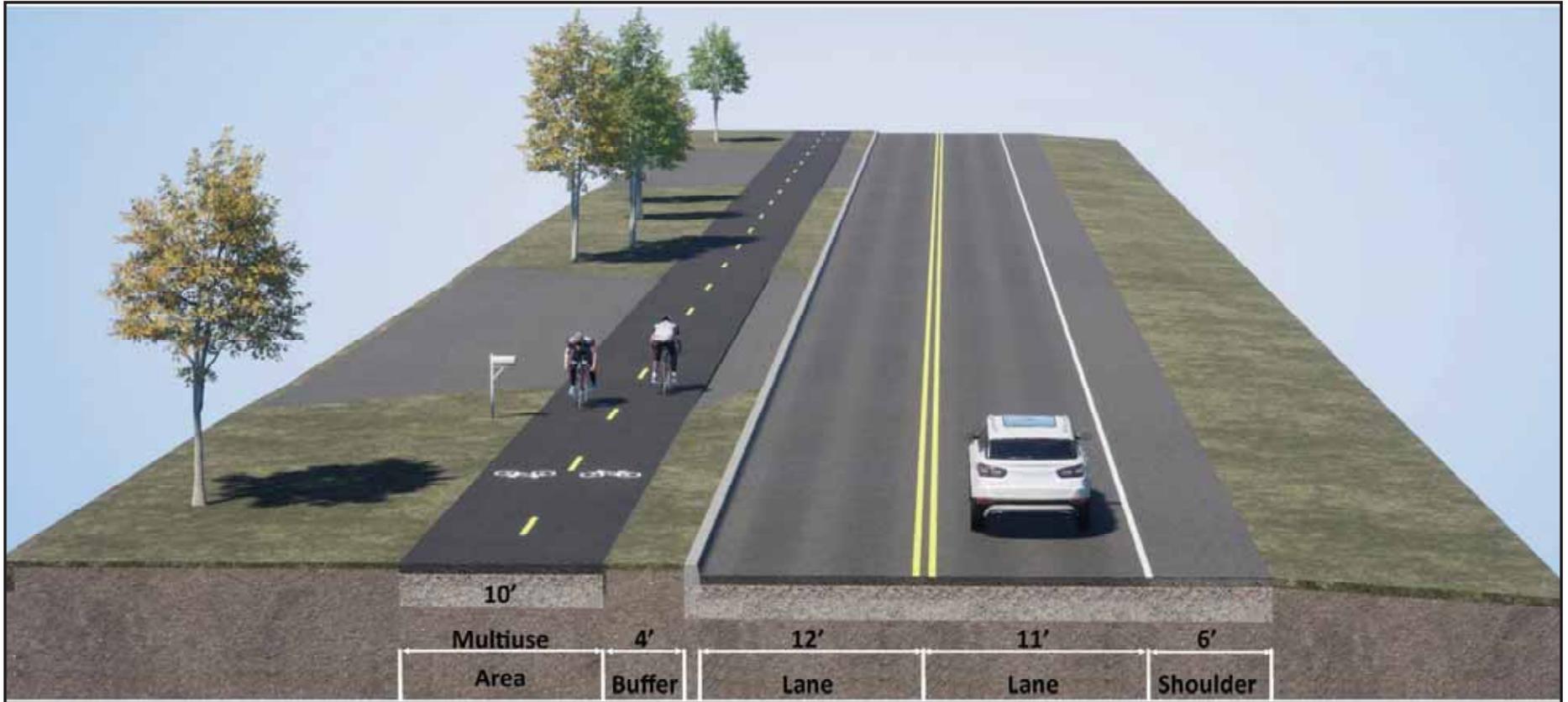


March 2025  
Not to Scale

US 322/PMG Modify Diamond Interchange  
with Ramp as Predominate Movement  
Figure 13

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania

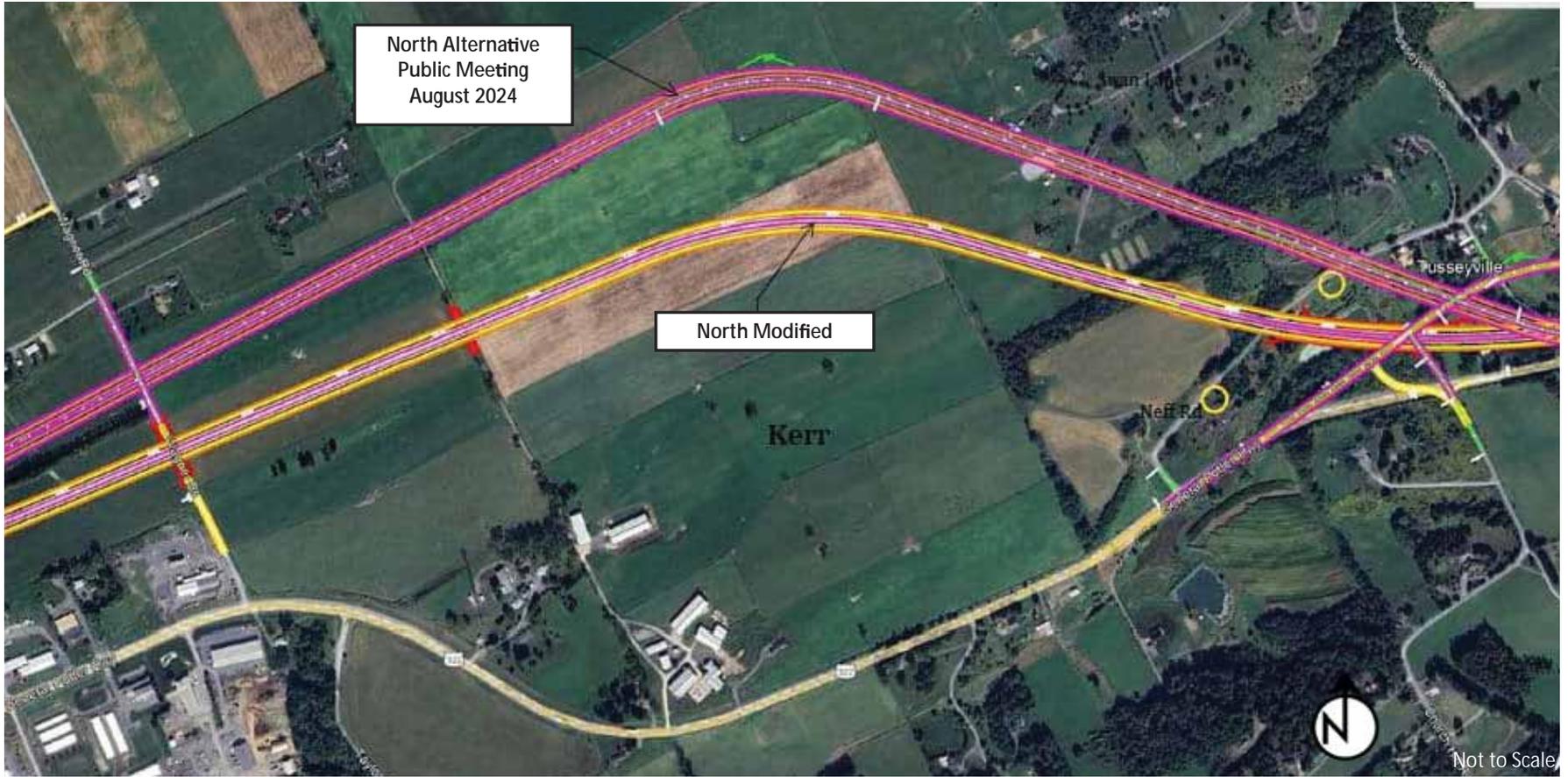


March 2025

Local Road with Shared Use Path  
 Typical Section and Rendering  
 Figure 14

state college area  
**CONNECTOR**

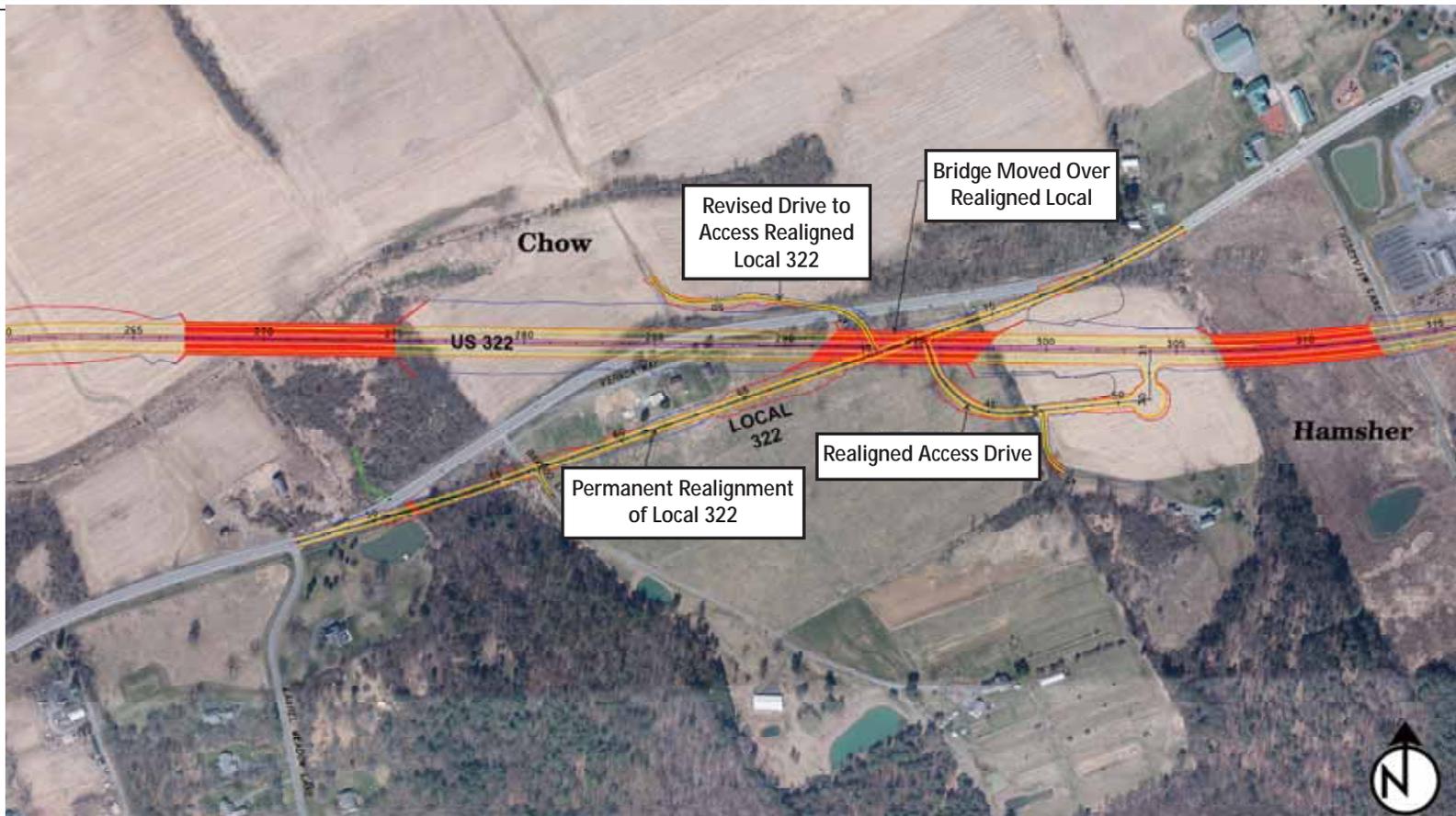
State College Area Connector Project  
 Centre County, Pennsylvania



North Alternative Alignment Modification  
Figure 15

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



March 2025

Not to Scale

Central Alternative Alignment Modification  
 Local 322 Realignment  
 Figure 16

state college area  
**CONNECTOR**

State College Area Connector Project  
 Centre County, Pennsylvania



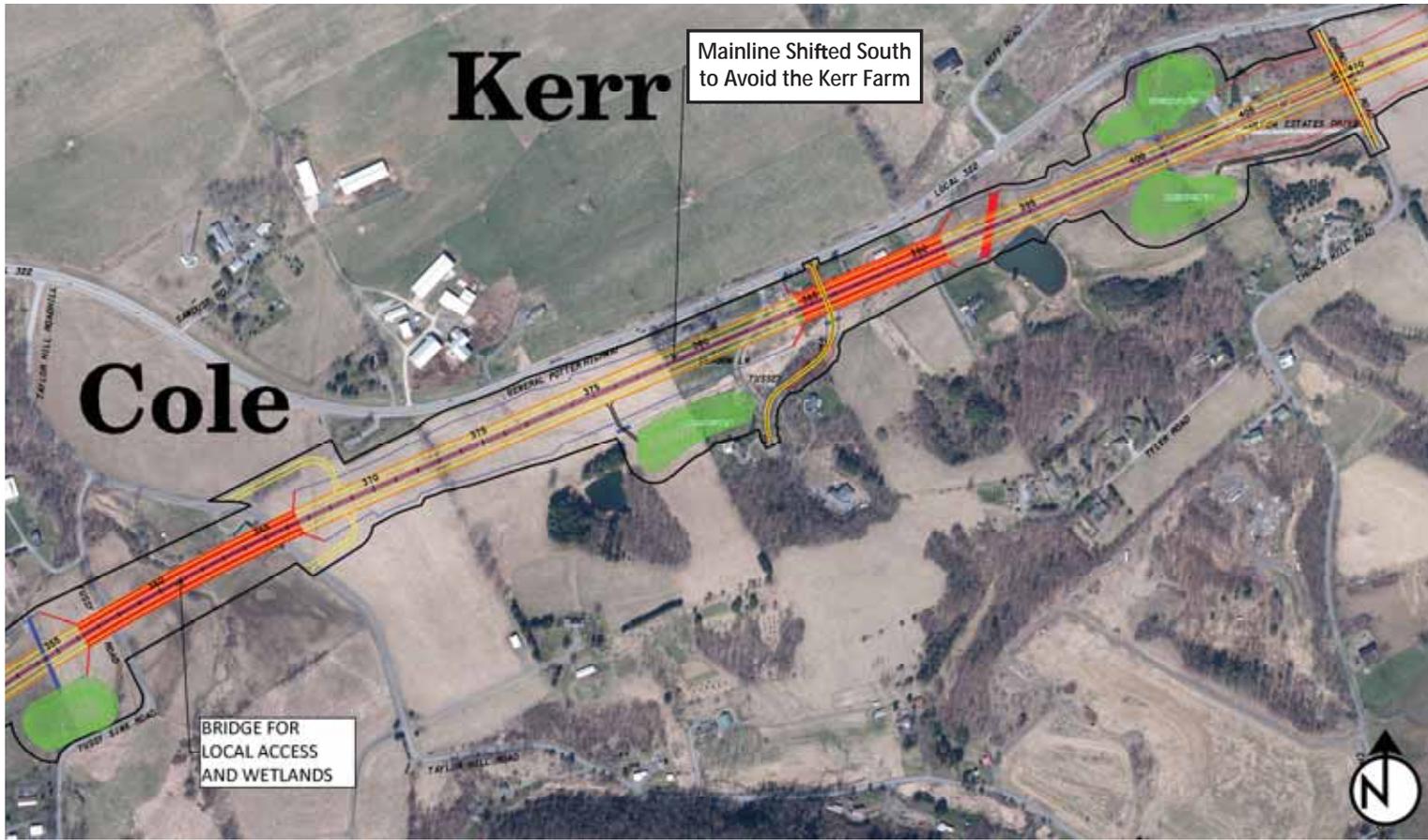
March 2025

Not to Scale

Central Alternative Alignment Modification  
 Zerby Road Extension  
 Figure 17

state college area  
**CONNECTOR**

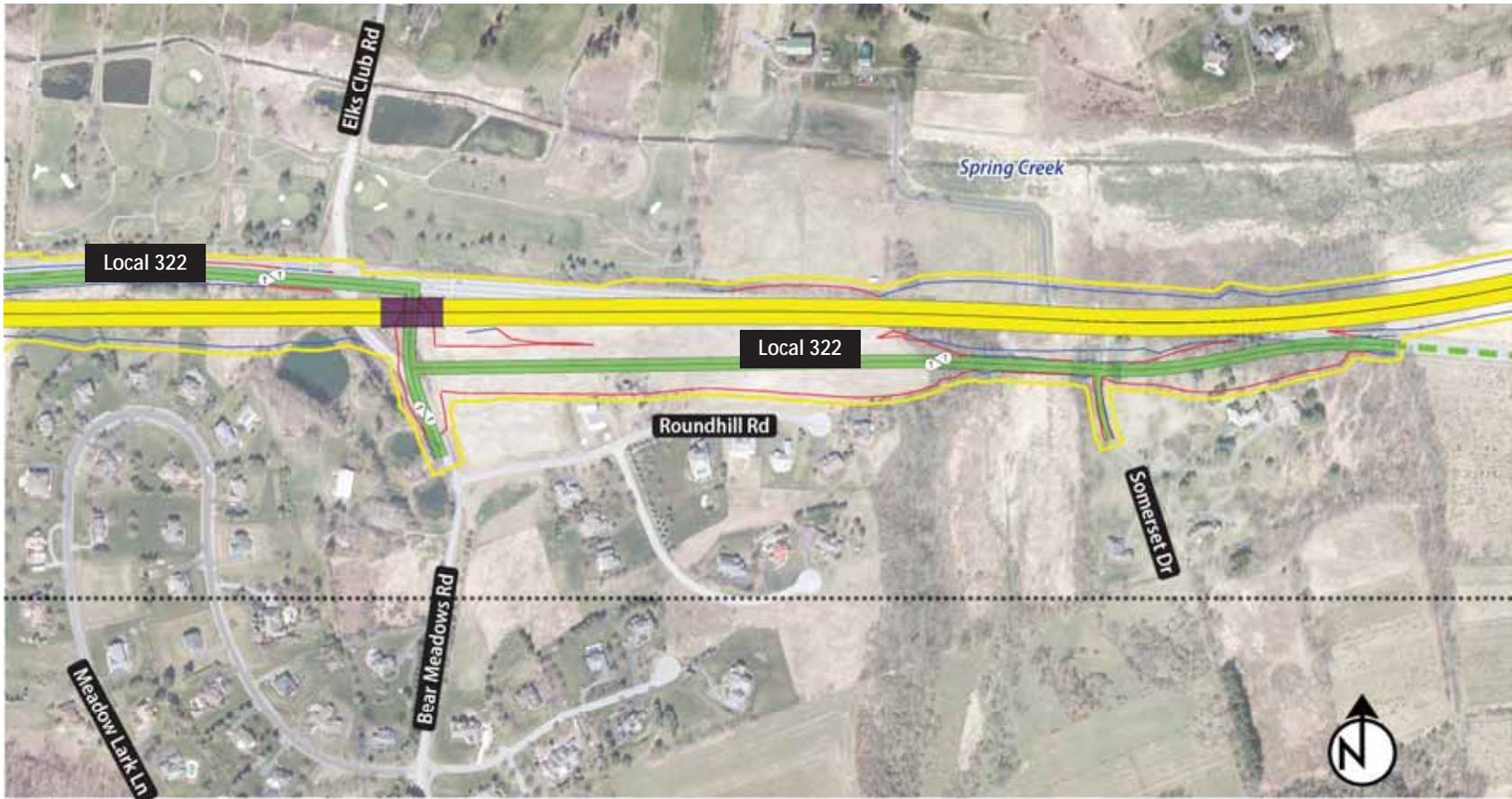
State College Area Connector Project  
 Centre County, Pennsylvania



South Alternative Alignment Modifications  
Figure 18

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania



March 2025

Not to Scale

Initial Local 322 Design with  
90-Degree turns at Bear Meadows Road  
Figure 19

state college area  
**CONNECTOR**

State College Area Connector Project  
Centre County, Pennsylvania

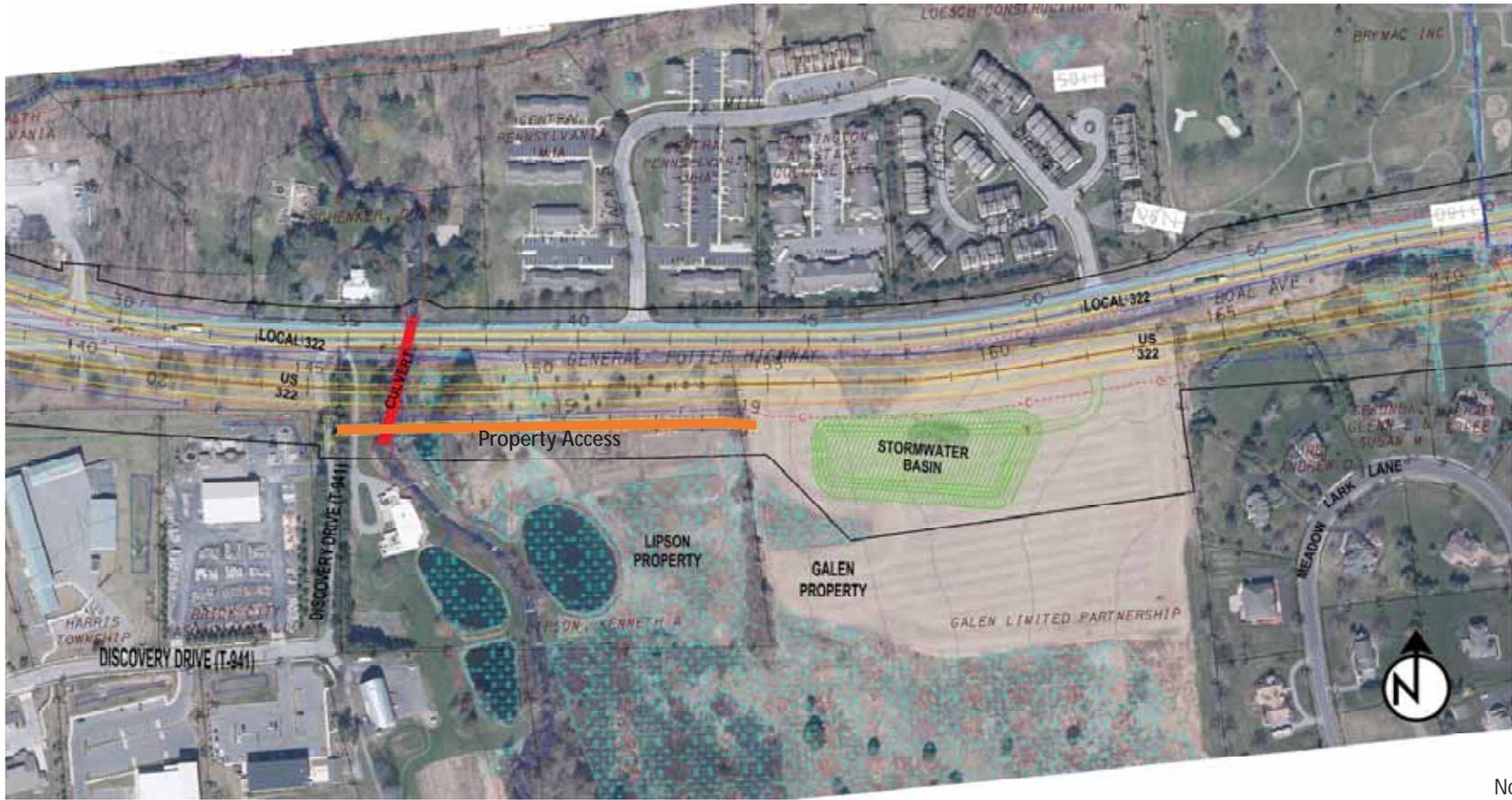


Not to Scale  
March 2025

Local 322 at Bear Meadows Road  
Advanced for Further Study  
Figure 20

state college area  
**CONNECTOR**

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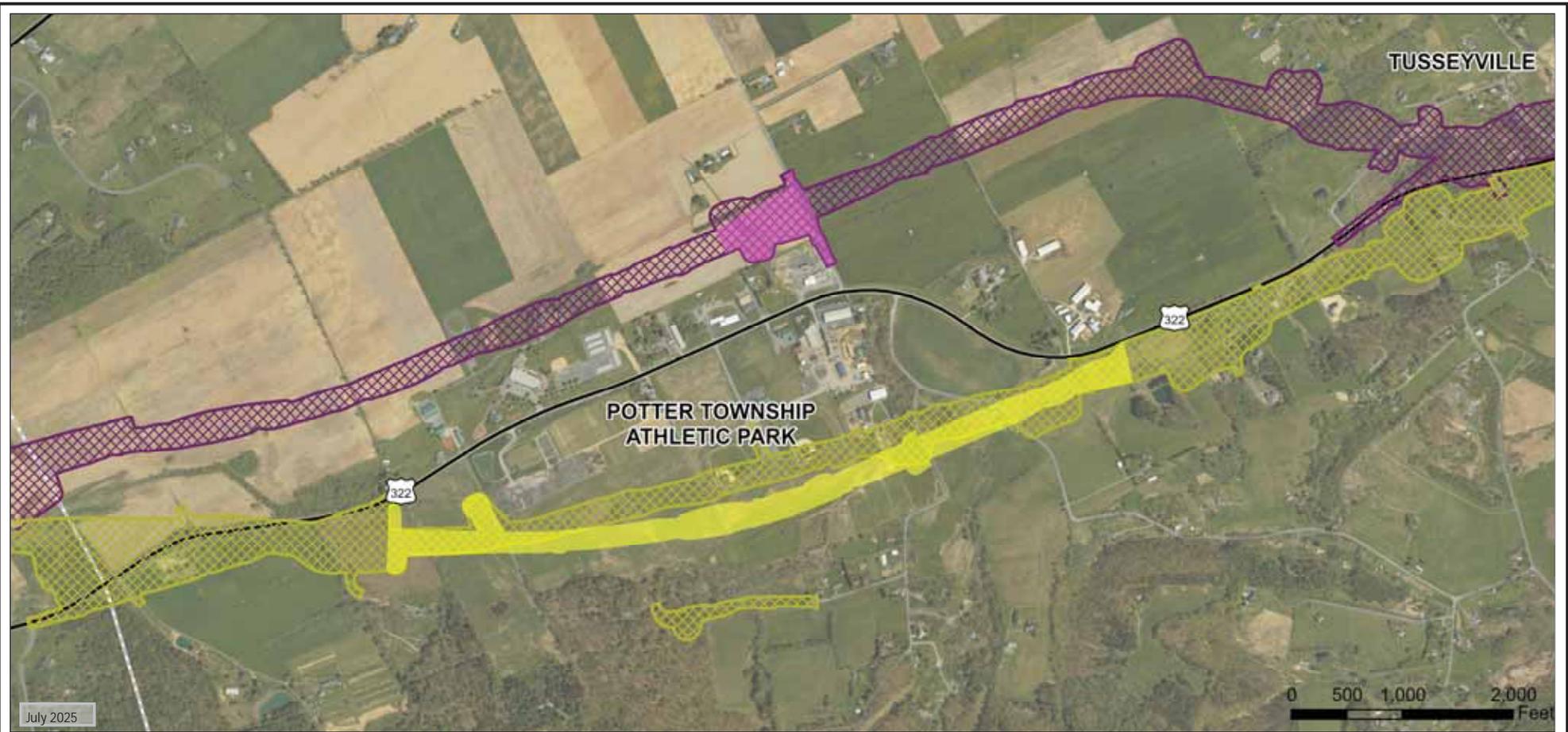
March 2025

Not to Scale

Lipson and Galen Property Access  
Figure 21

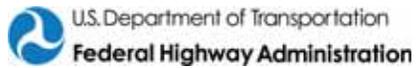
state college area  
**CONNECTOR**

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**Legend**

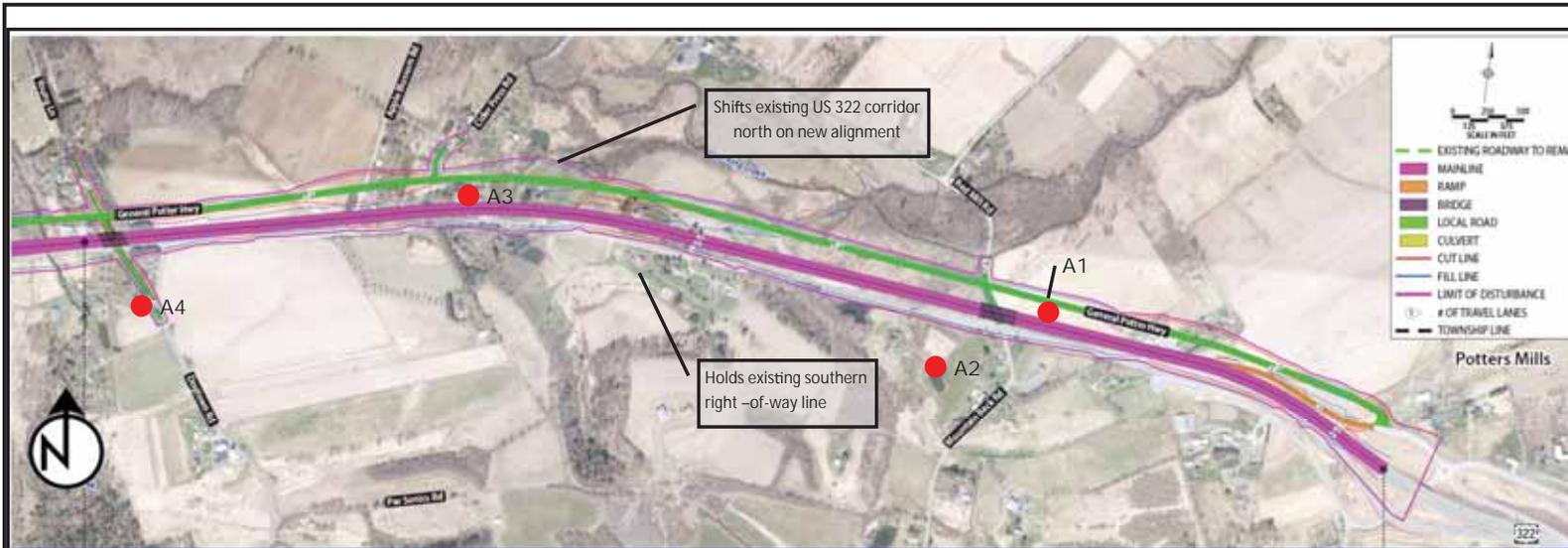
- July 2025 Central Alternative Refinement
- May 2025 Central Alternative
- July 2025 North Alternative Refinement
- May 2025 North Alternative



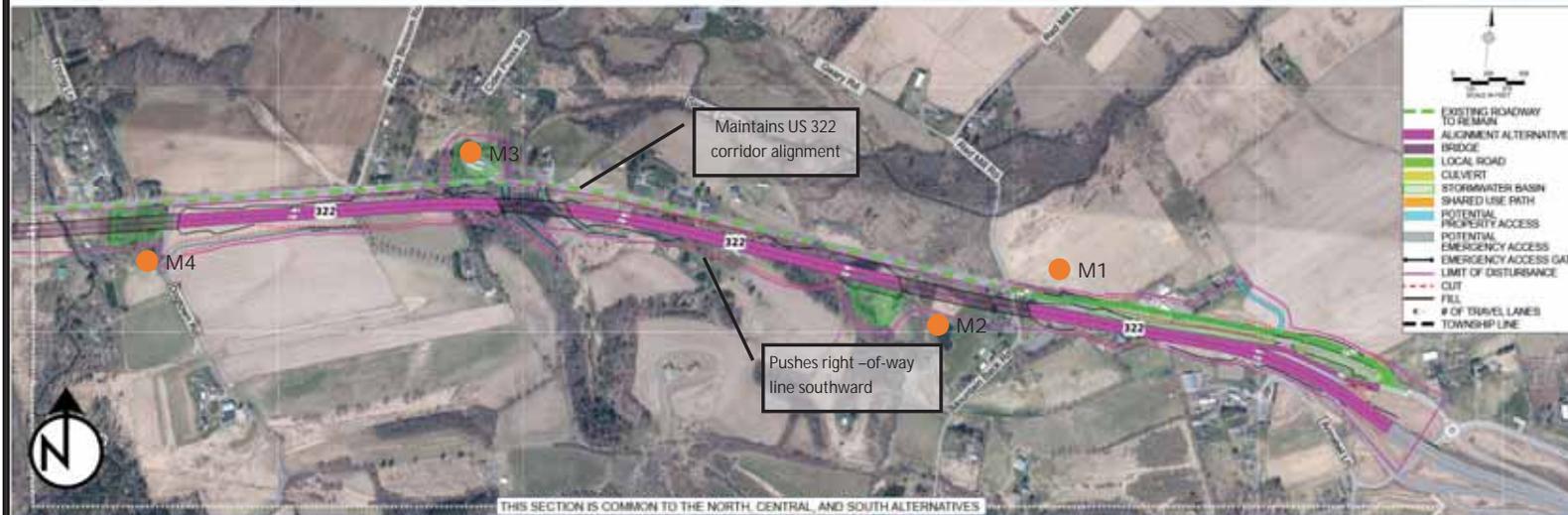
North and Central Alternative Refinements  
Figure 22

state college area  
**CONNECTOR**

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**NORTH ALTERNATIVE - AUGUST 2024**



**NORTH ALTERNATIVE - MAY 2025**

# LEGEND

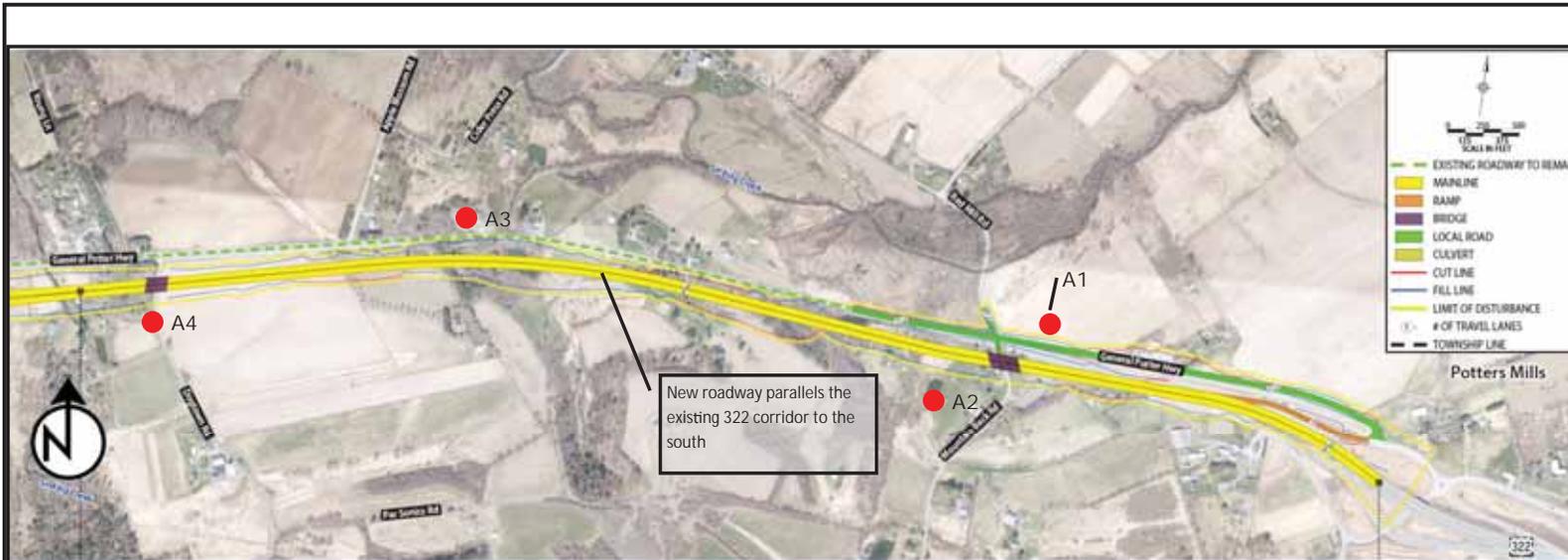
- A# - Comparative point August Mapping
- M# - Comparative Point May Mapping



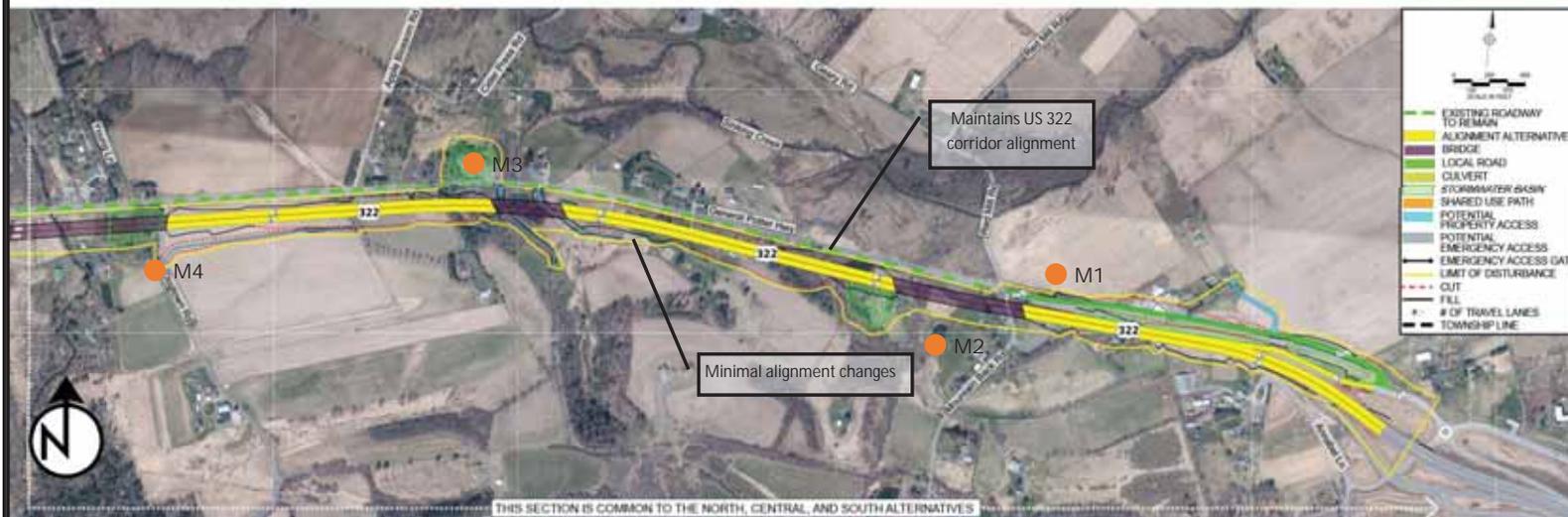
Eastern End Alignment Modification  
North Alternative  
Figure 23A

state college area  
**CONNECTOR**

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Centre County, Pennsylvania



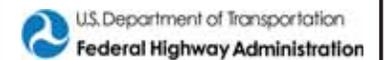
**CENTRAL ALTERNATIVE - AUGUST 2024**



**CENTRAL ALTERNATIVE - MAY 2025**

## LEGEND

- A# - Comparative point August Mapping
- M# - Comparative Point May Mapping



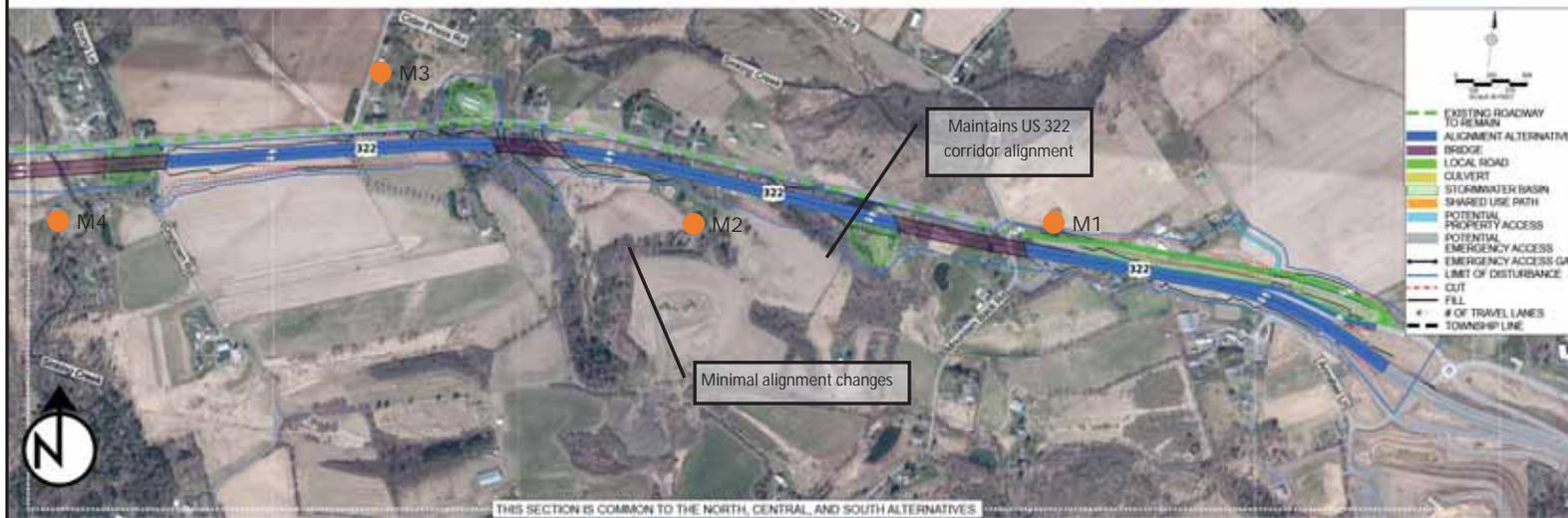
Eastern End Alignment  
Modification  
Central Alternative  
Figure 23B

state college area  
**CONNECTOR**

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Centre County, Pennsylvania



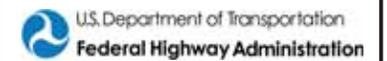
**SOUTH ALTERNATIVE - AUGUST 2024**



**SOUTH ALTERNATIVE - MAY 2025**

## LEGEND

- A# - Comparative point August Mapping
- M# - Comparative Point May Mapping



Eastern End Alignment  
Modification  
South Alternative  
Figure 23C

state college area  
**CONNECTOR**

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**NORTH ALTERNATIVE EVALUATED IN THE EIS**  
**Figure 24**



Pennsylvania  
Department of Transportation

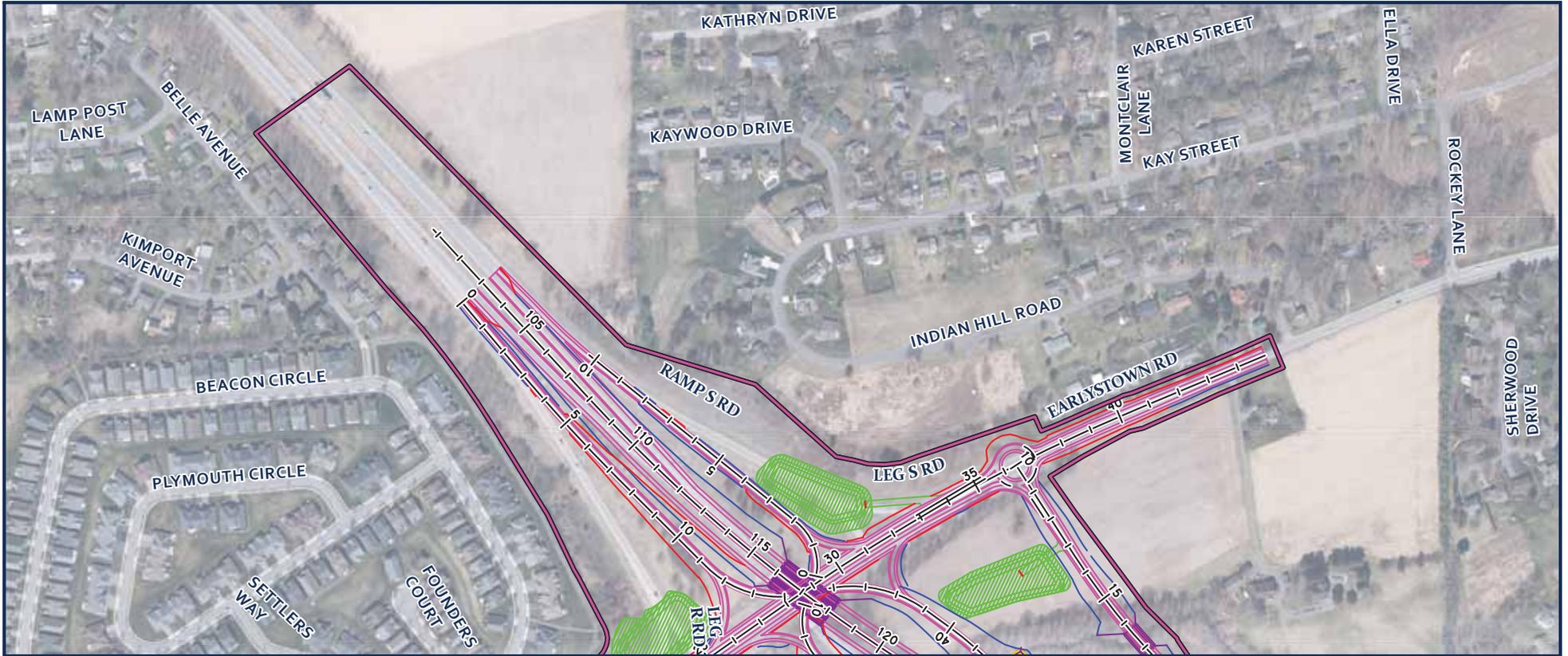
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State College Area Connector Project  
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July 2025

Cover Page



North Alternative Evaluated in the EIS  
Figure 24



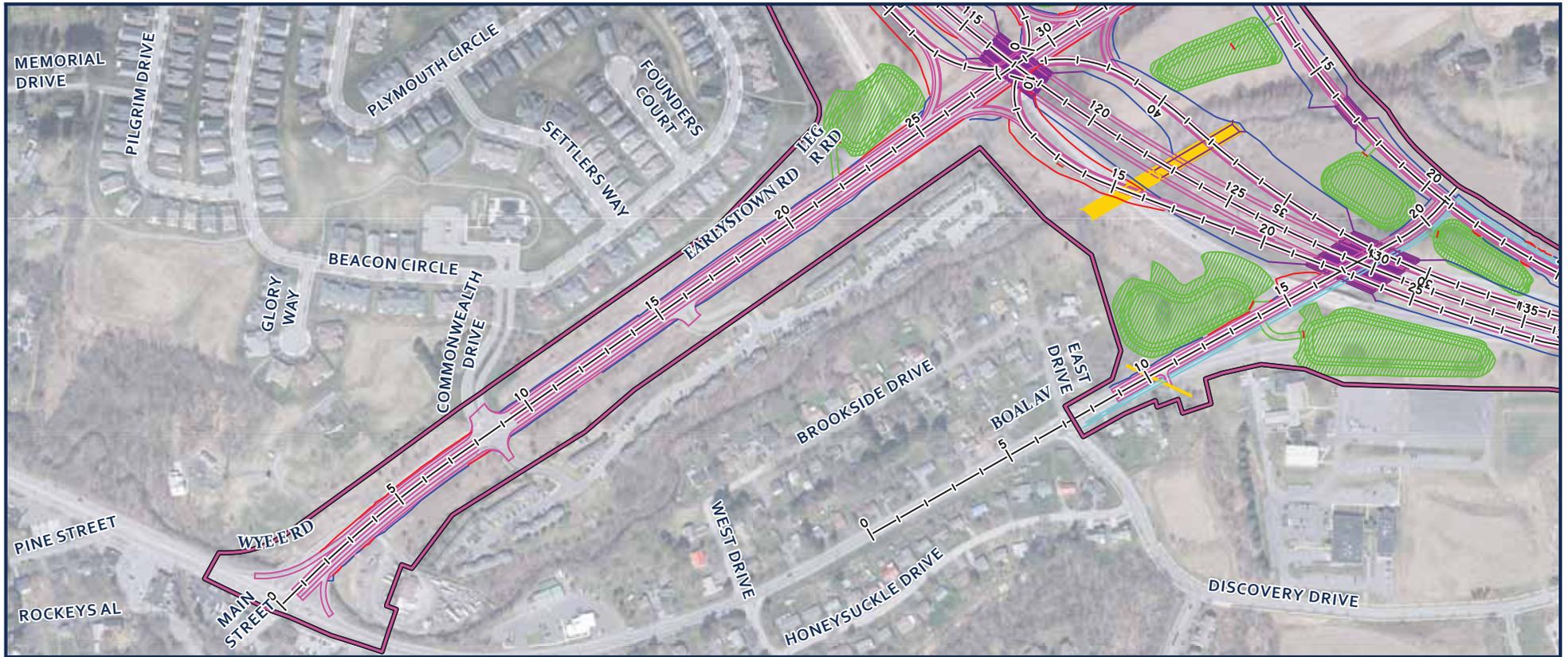
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North Alternative Evaluated in the EIS  
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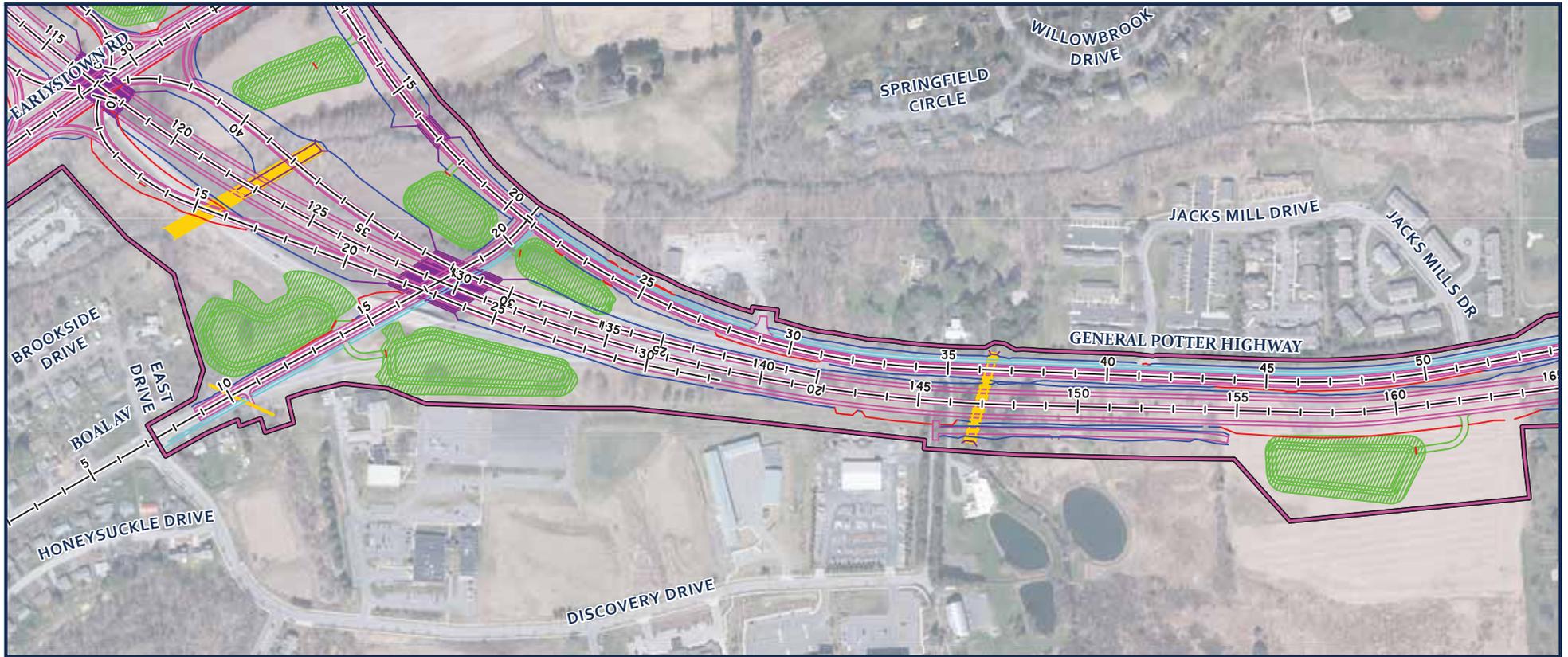
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North Alternative Evaluated in the EIS  
Figure 24

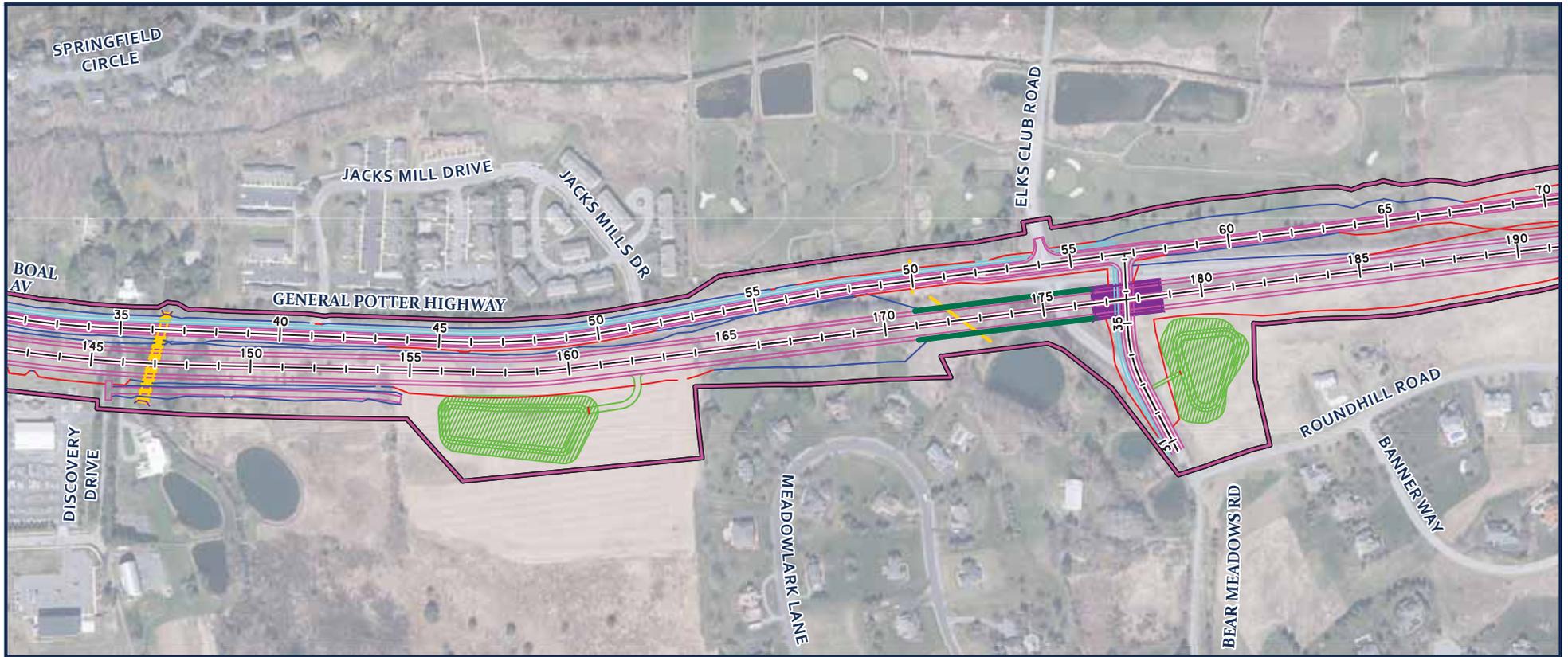


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North Alternative Evaluated in the EIS  
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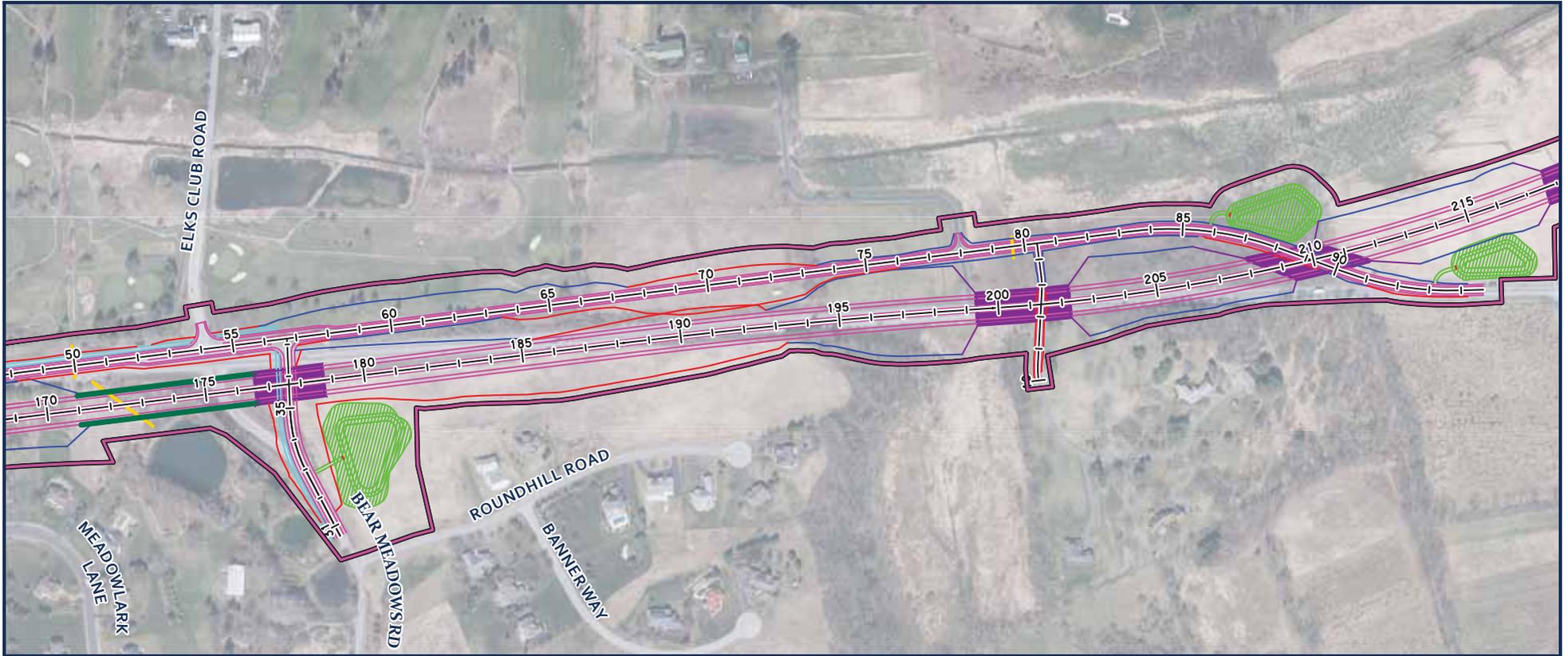


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North Alternative Evaluated in the EIS  
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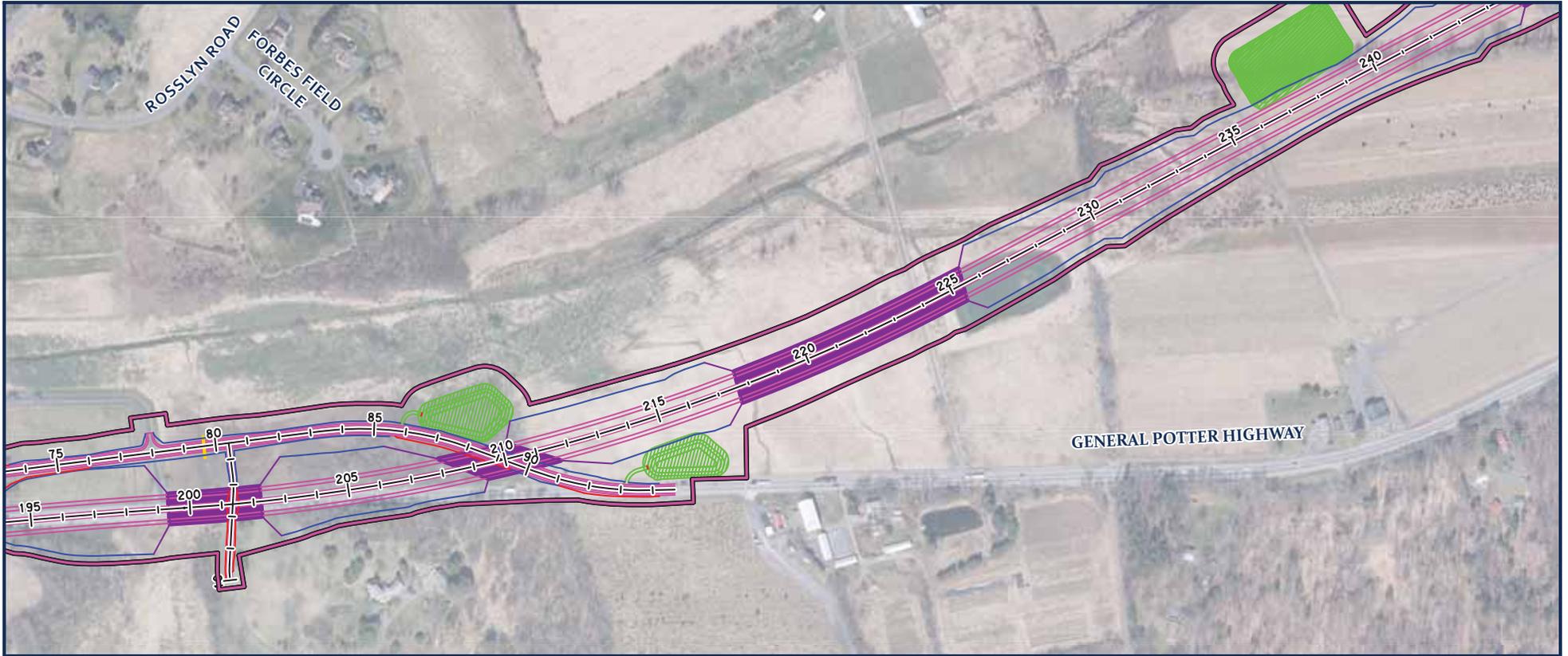
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North Alternative Evaluated in the EIS  
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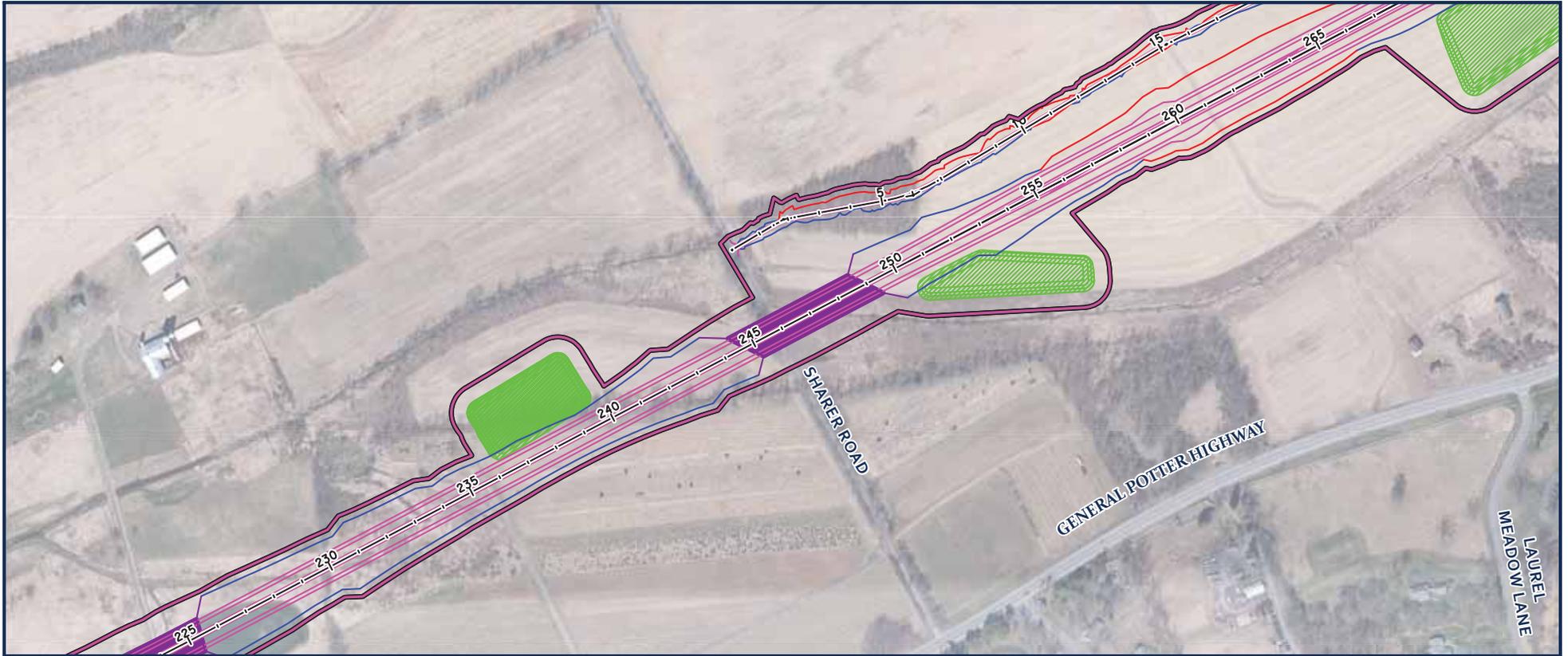


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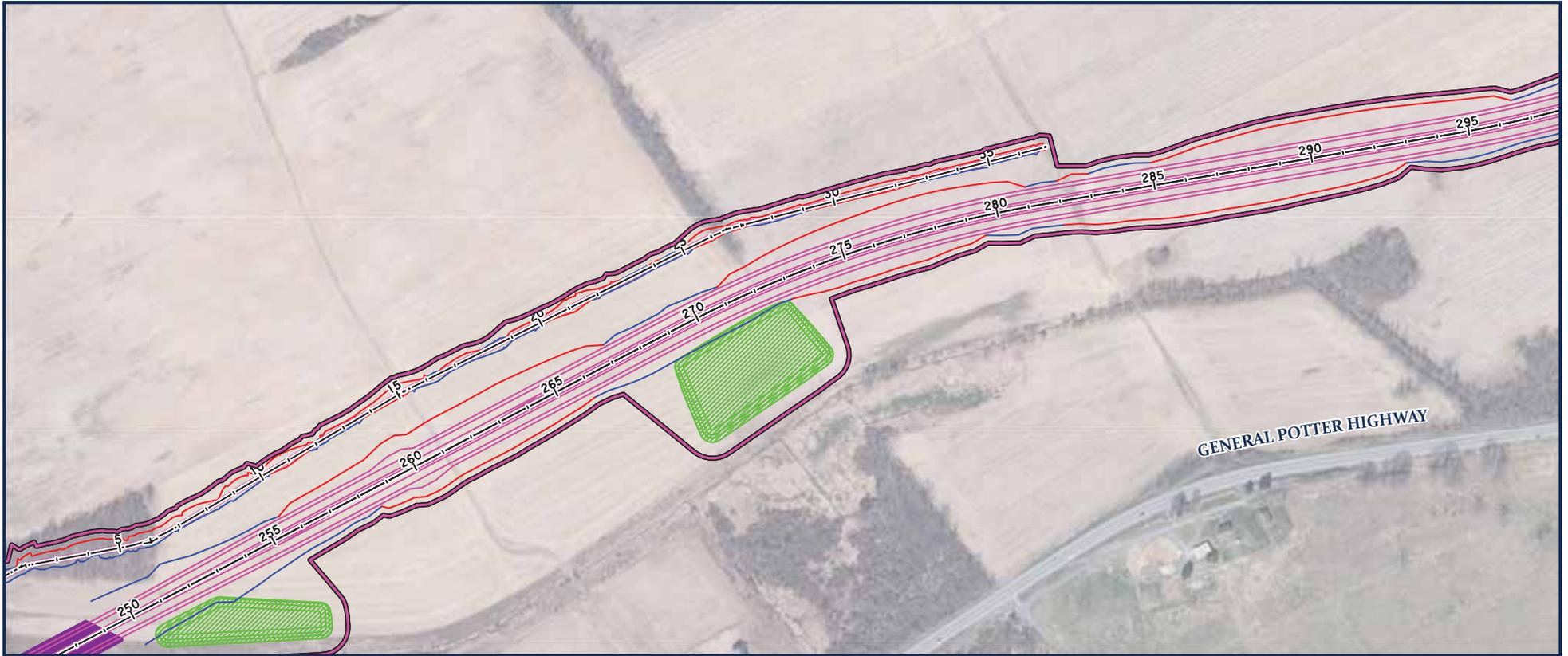


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North Alternative Evaluated in the EIS  
Figure 24





North Alternative Evaluated in the EIS  
Figure 24

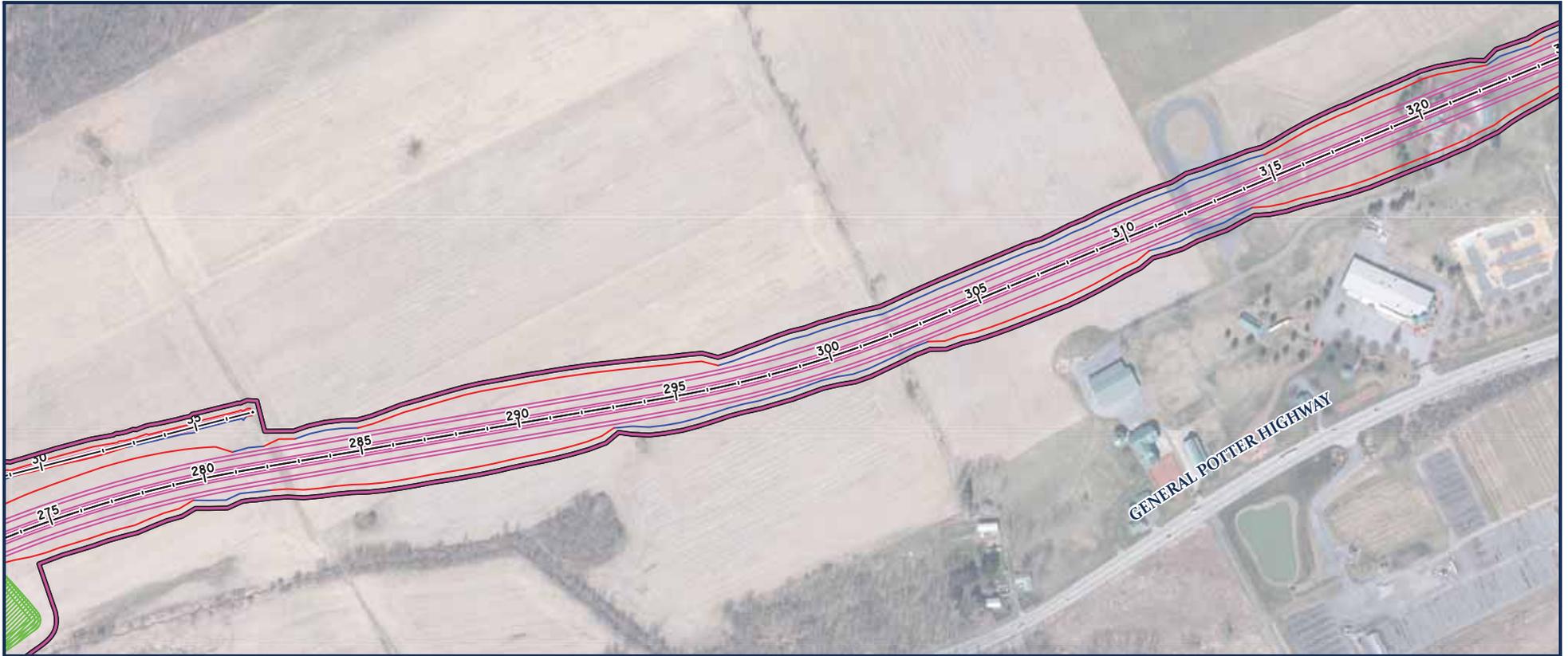


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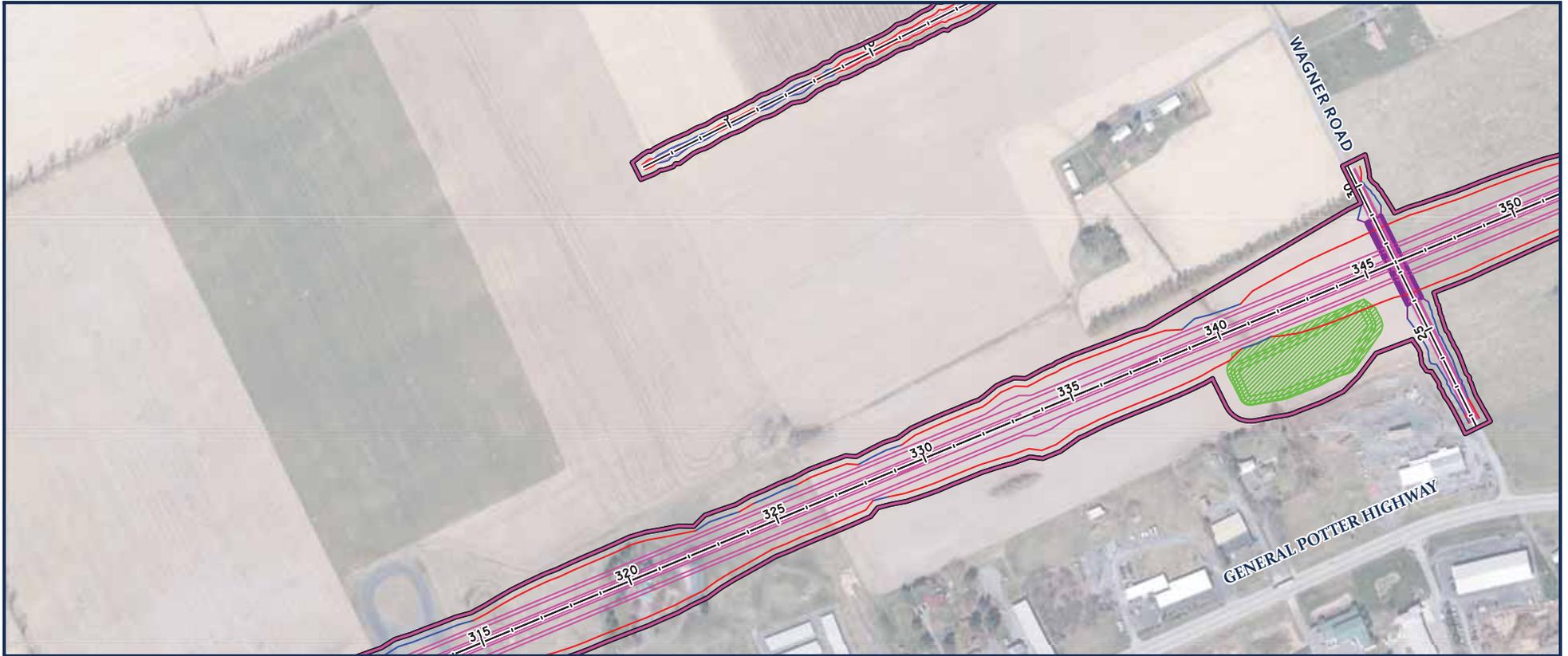


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North Alternative Evaluated in the EIS  
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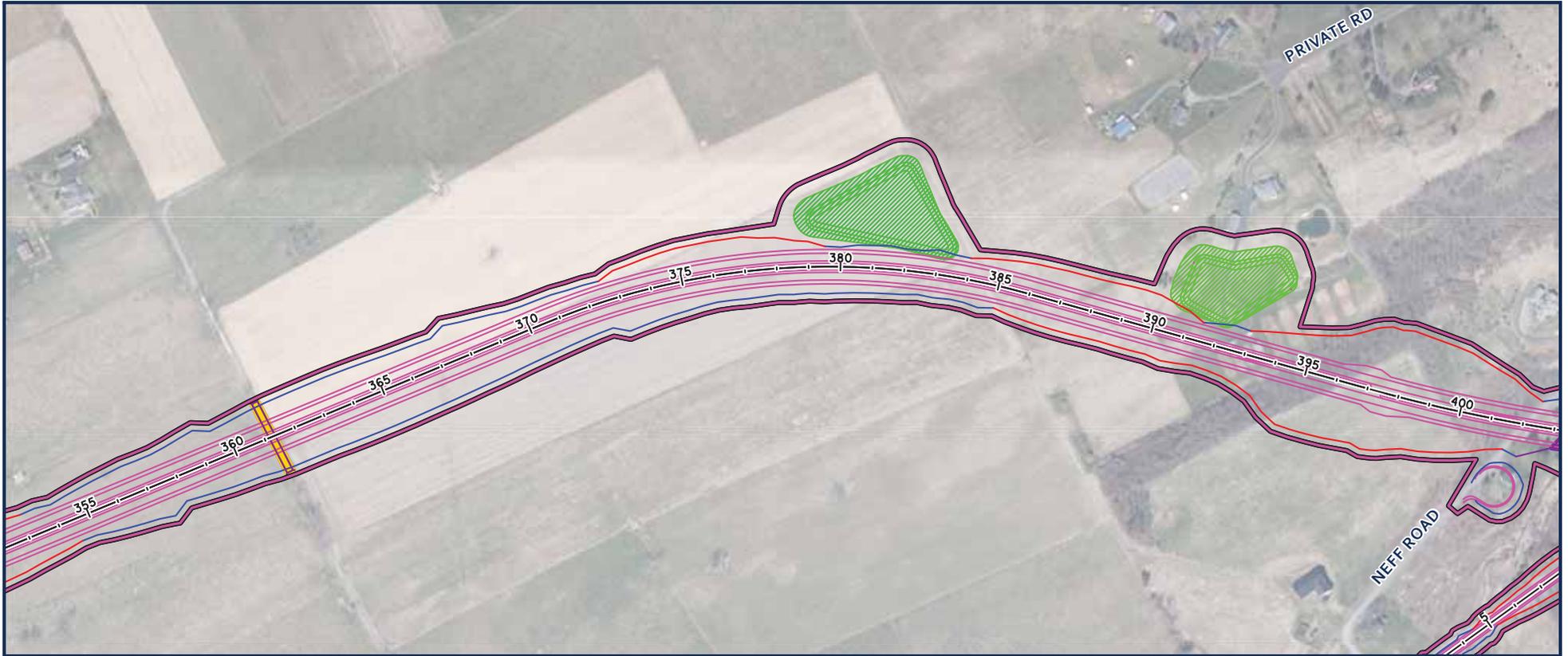


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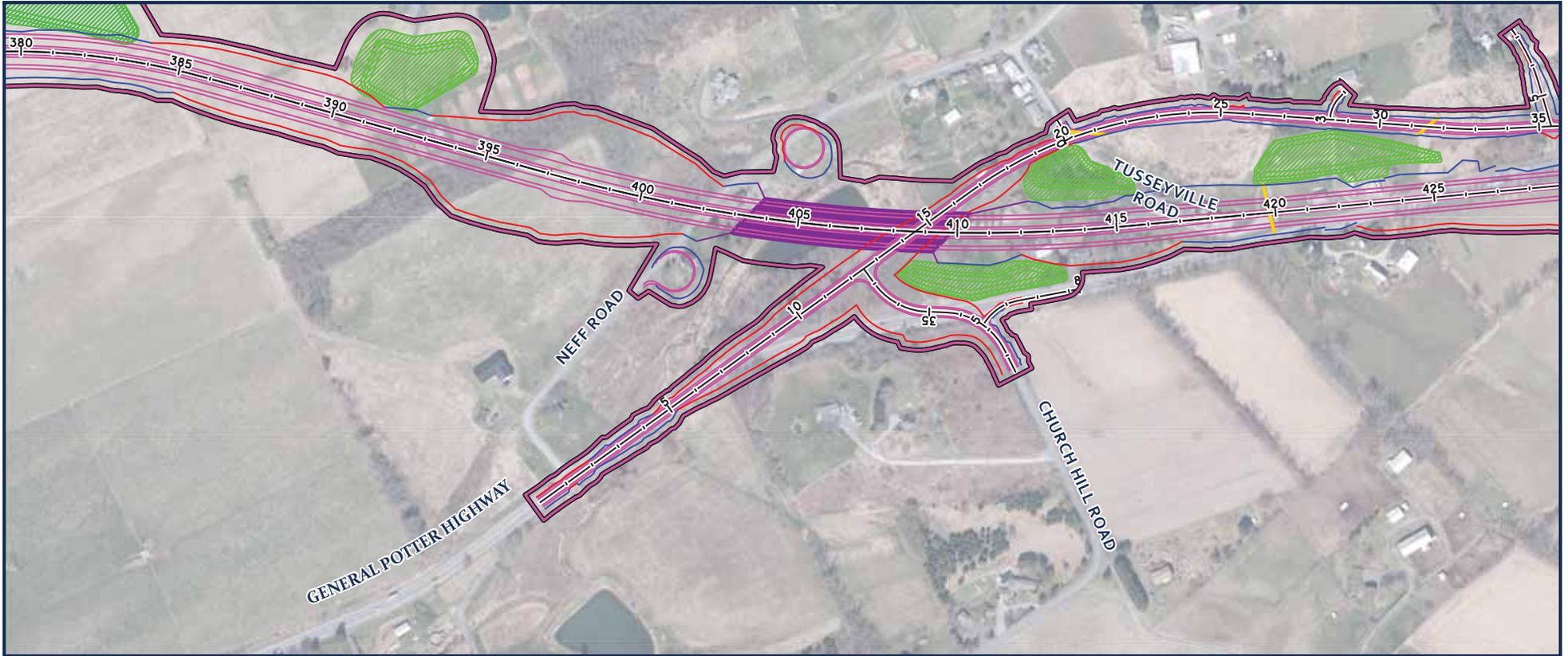


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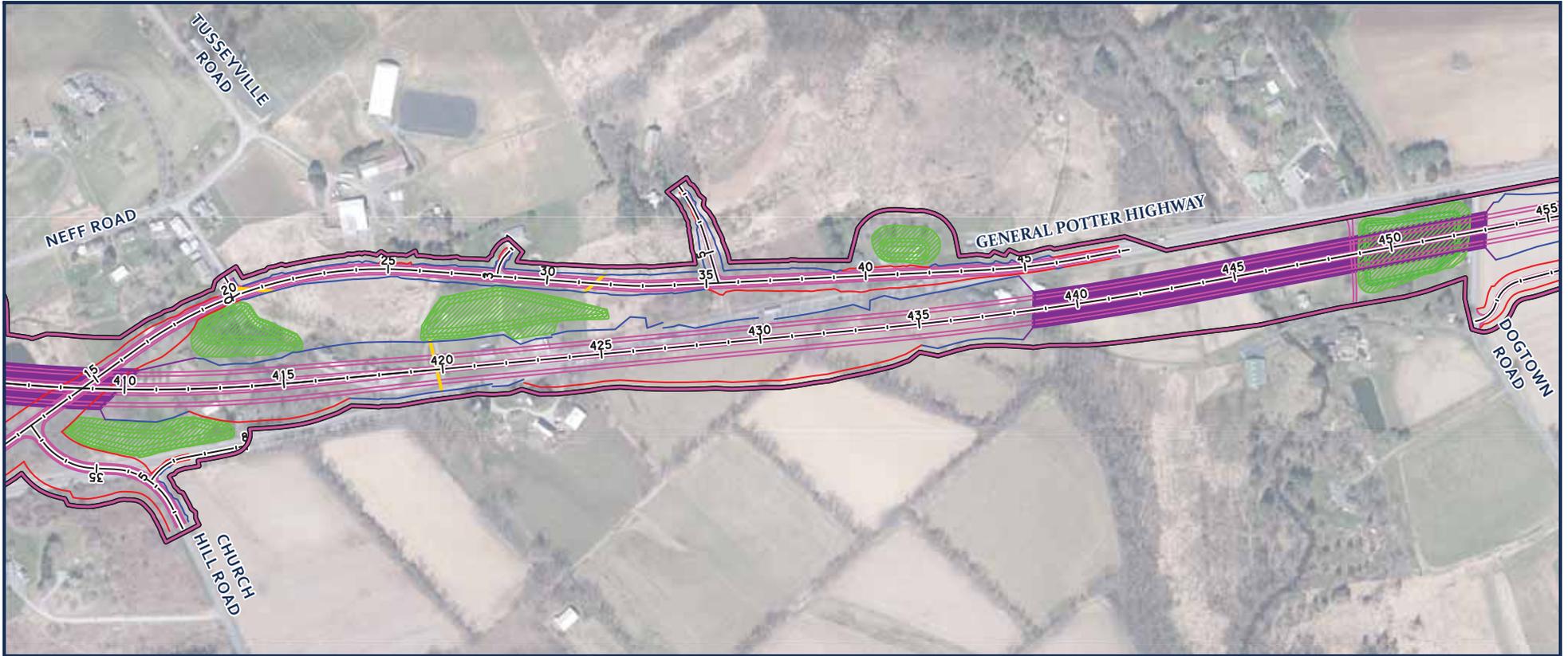
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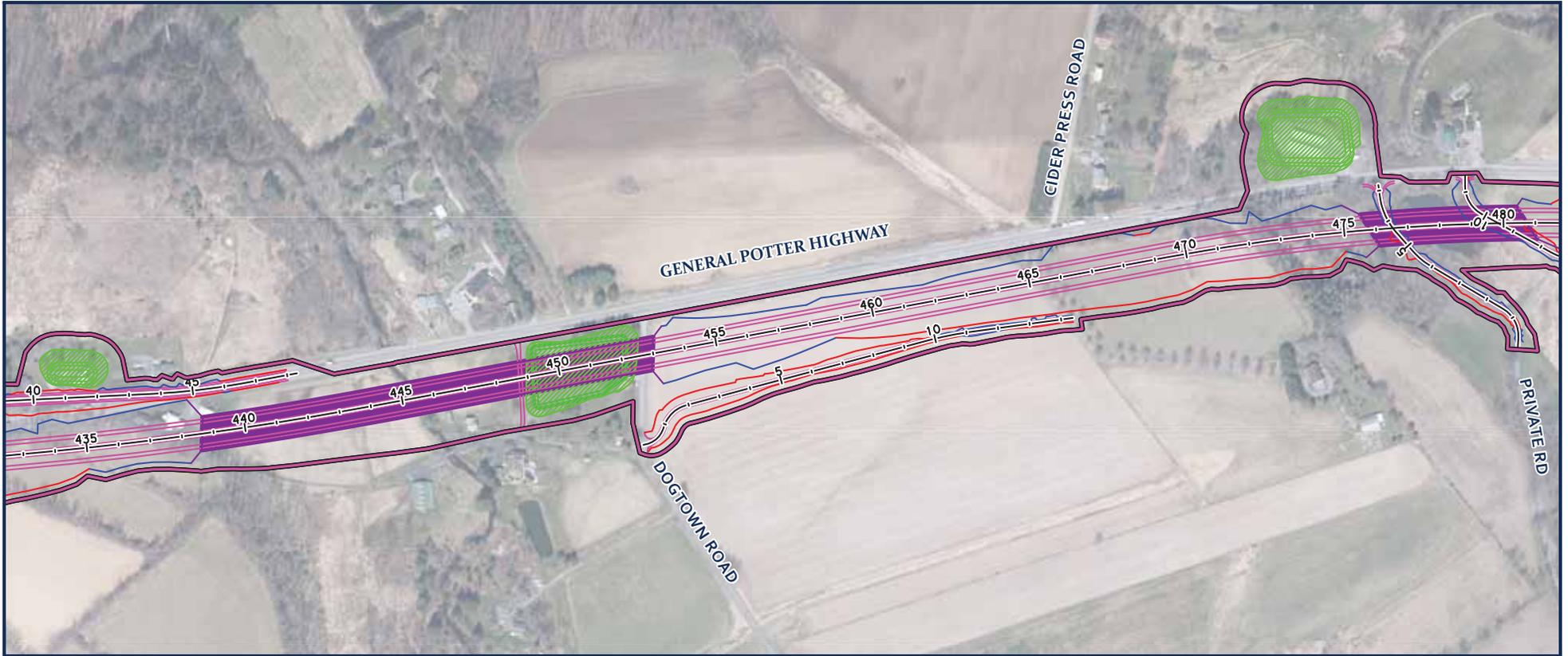


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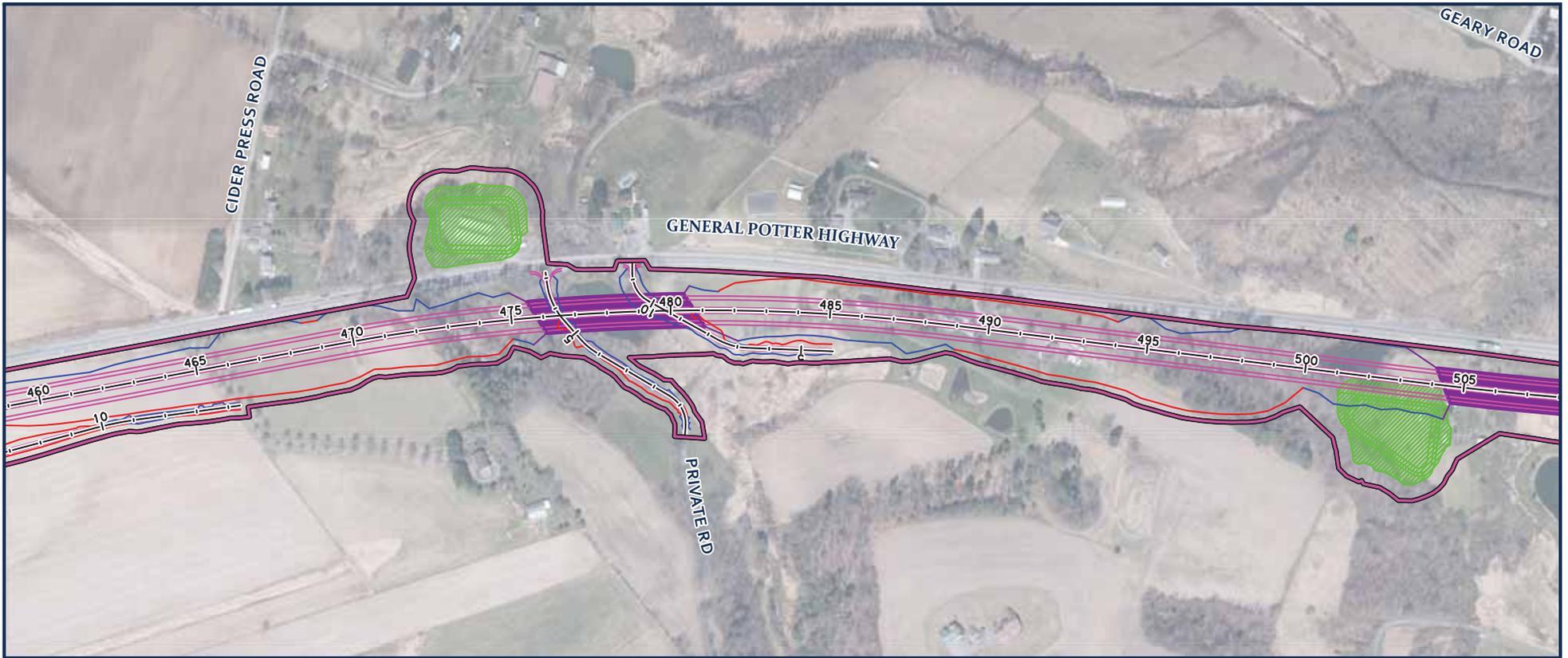


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Figure 24

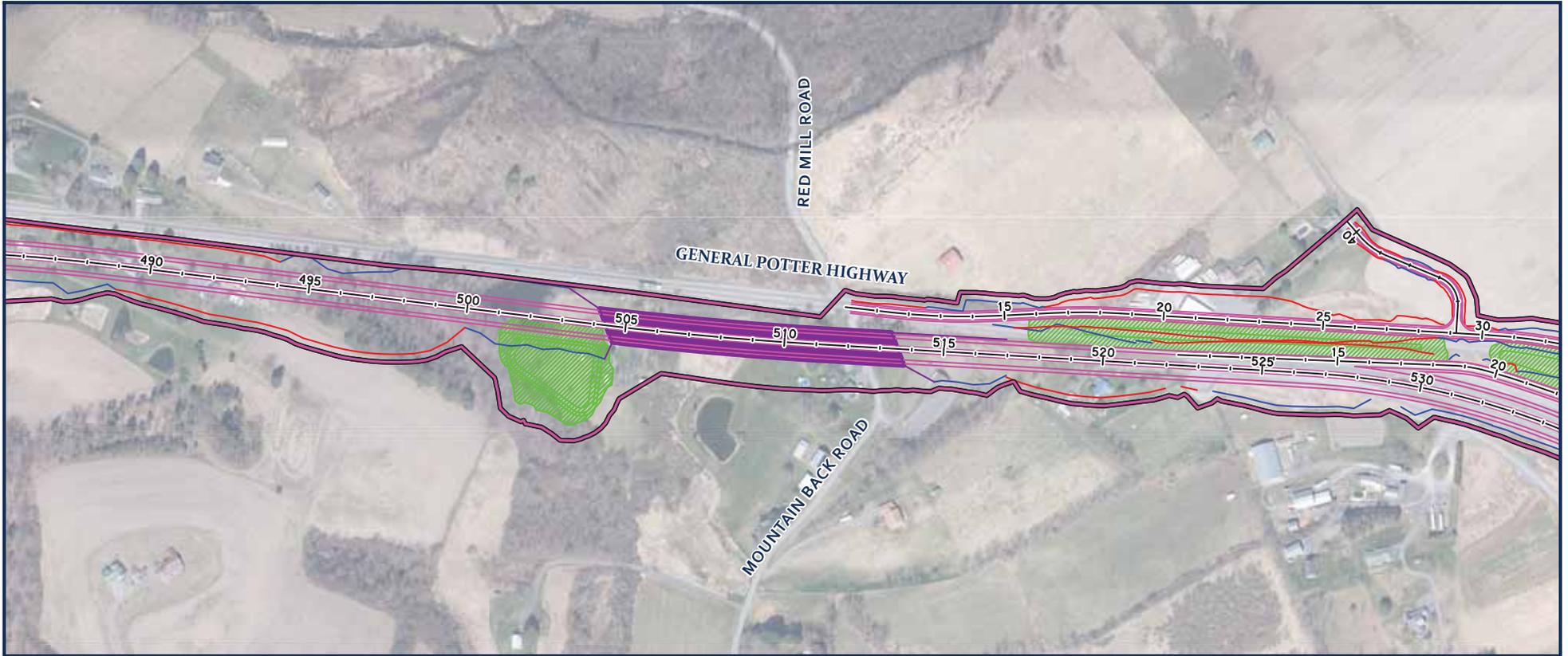




0 0.05 0.1 Miles

North Alternative Evaluated in the EIS  
Figure 24

N



North Alternative Evaluated in the EIS  
Figure 24

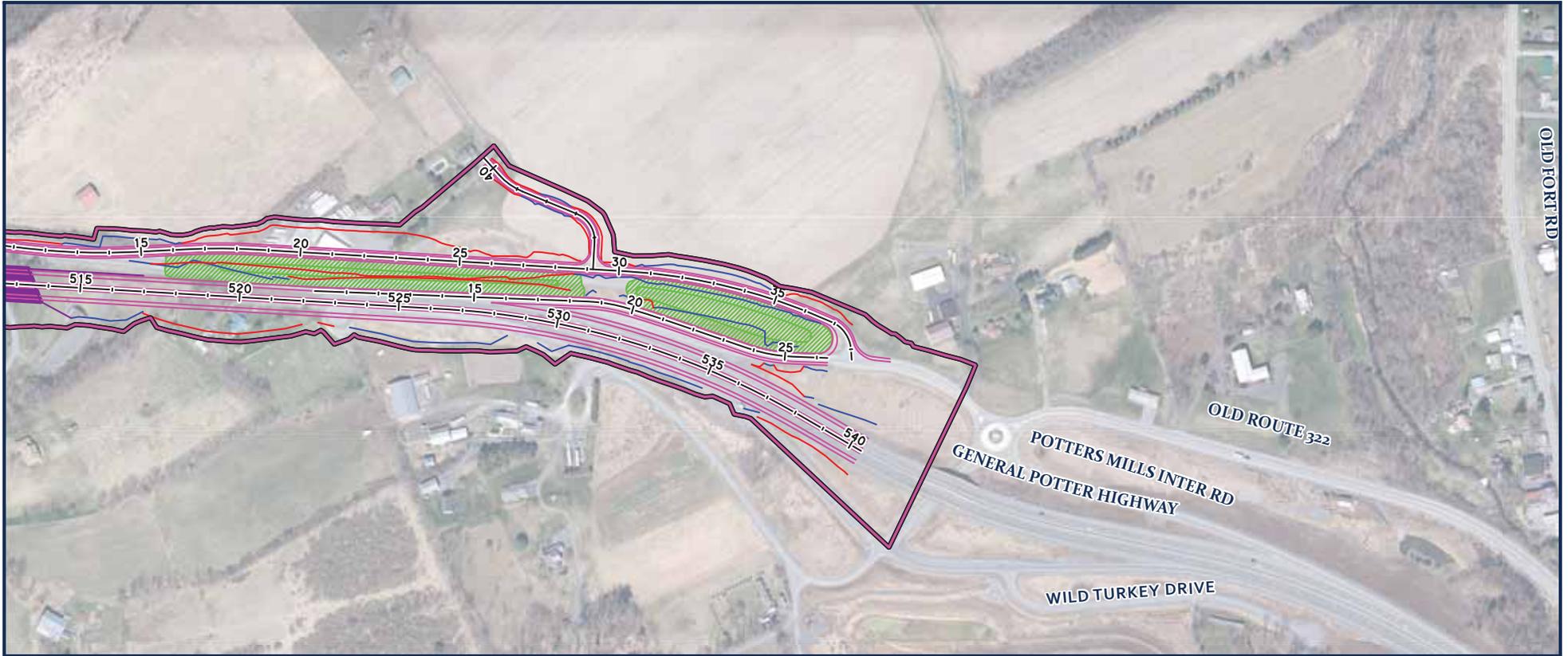


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North Alternative Evaluated in the EIS  
Figure 24



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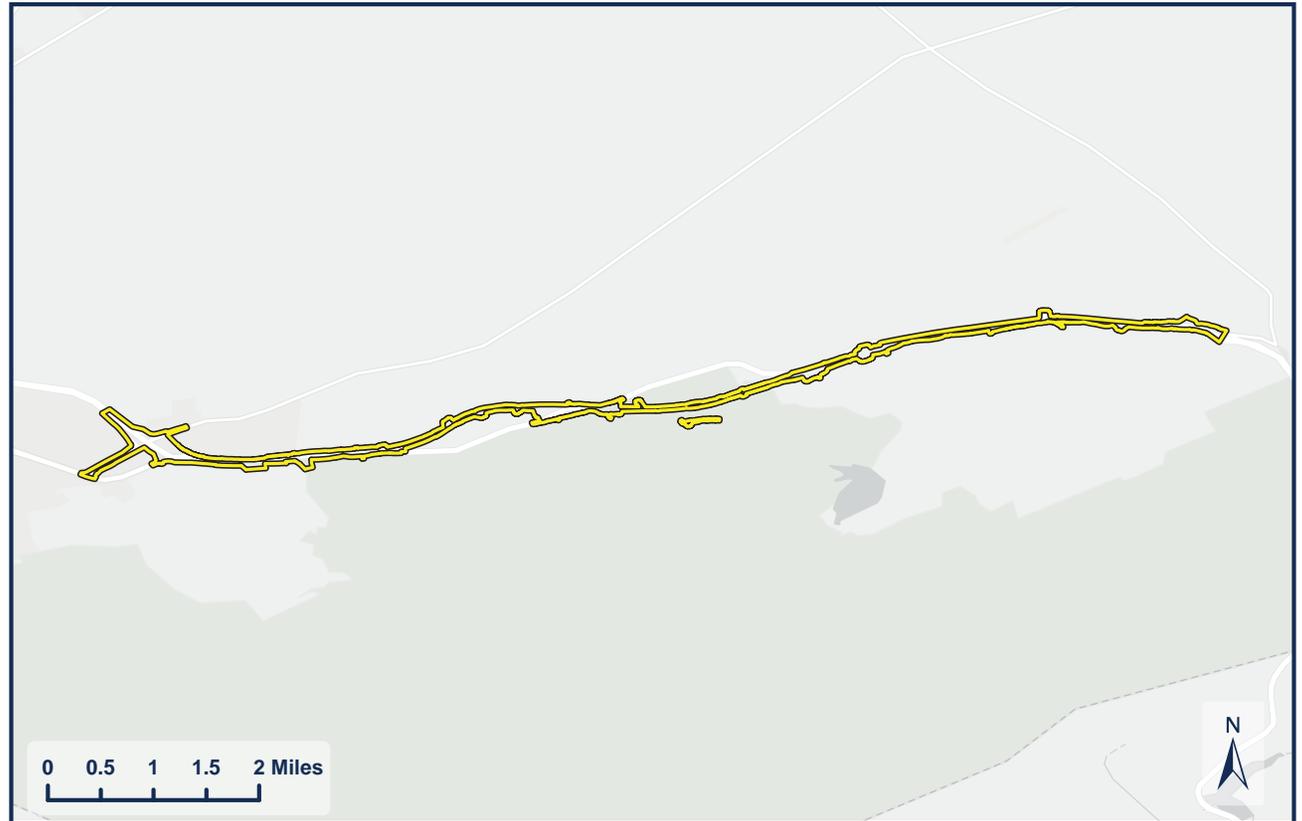


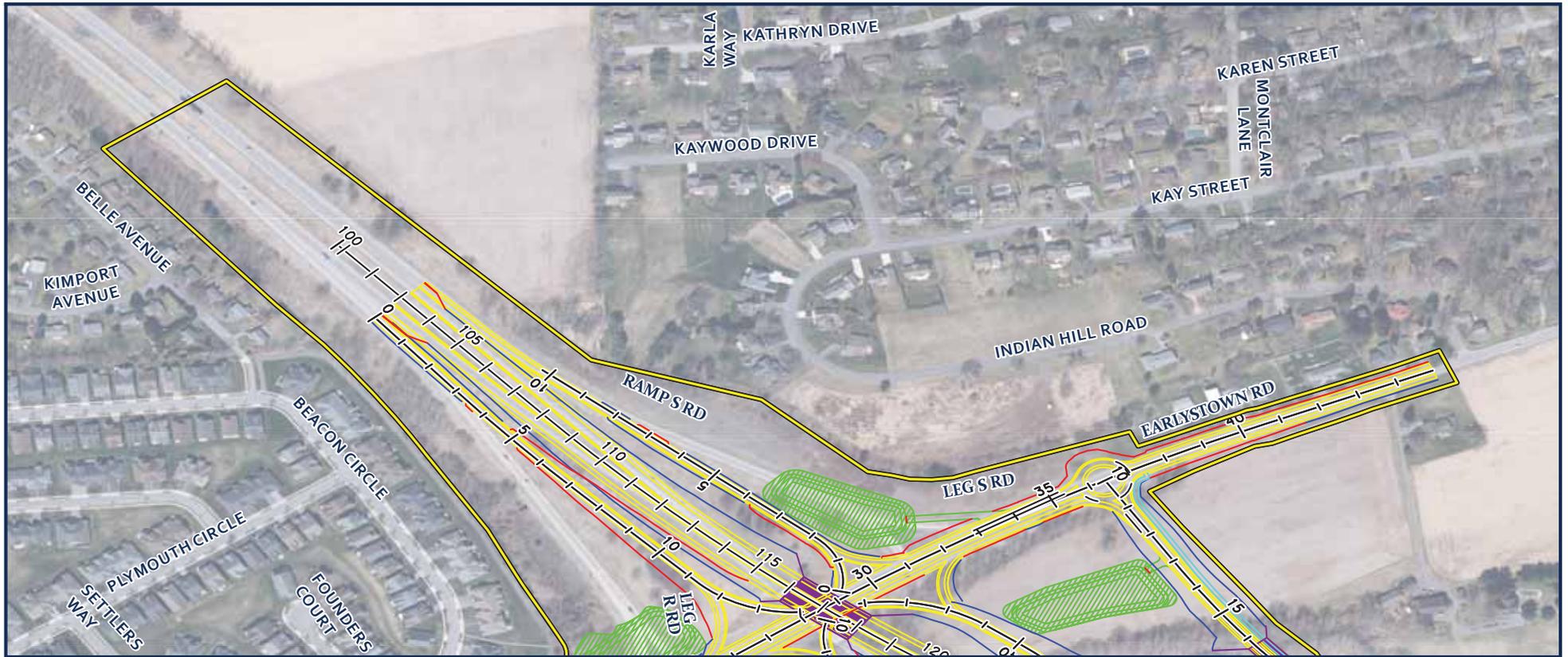
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CENTRAL ALTERNATIVE EVALUATED IN THE EIS  
**Figure 25**

Legend

- Station Line and Number
- Central Alternative Roadway Lane
- Cut
- Fill
- Shared-use Path
- Retaining Wall
- Limit of Disturbance
- Stormwater Pond
- Culvert/Pipe
- Bridge





0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25



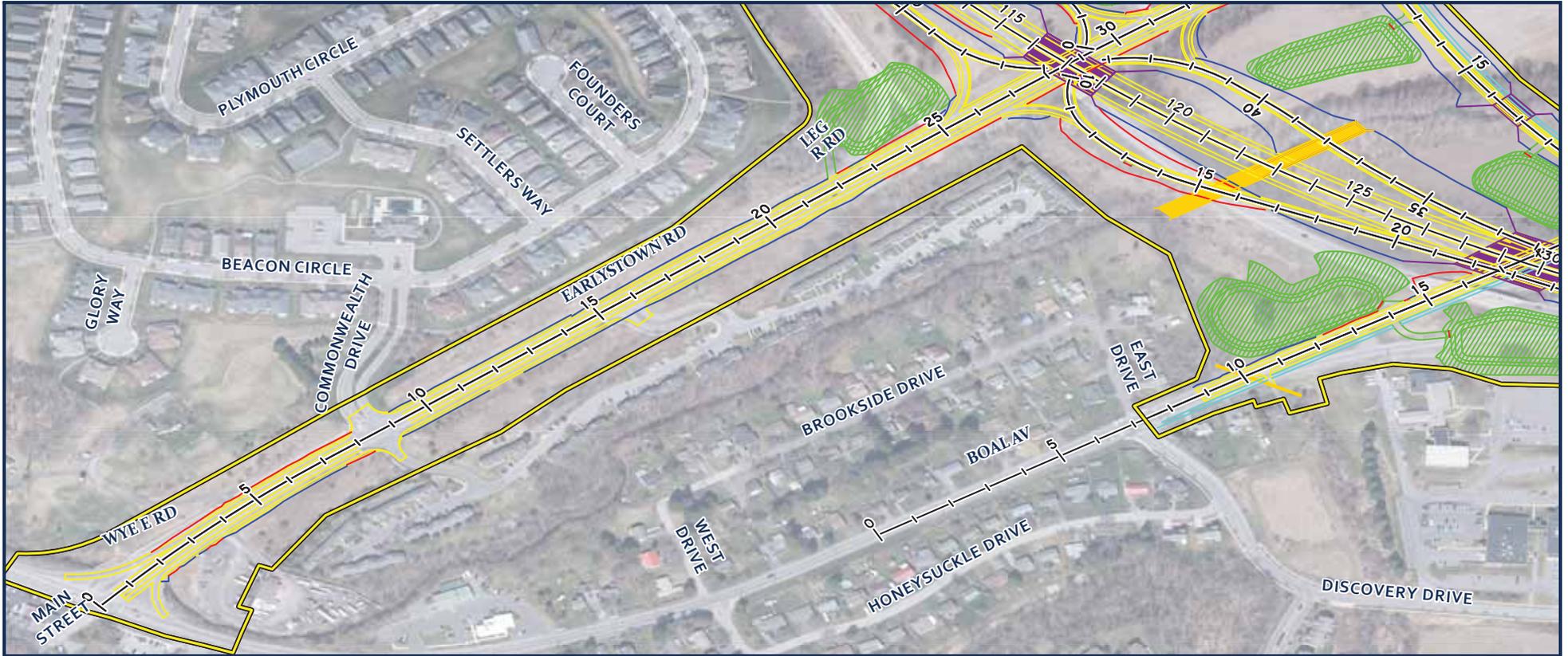
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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25



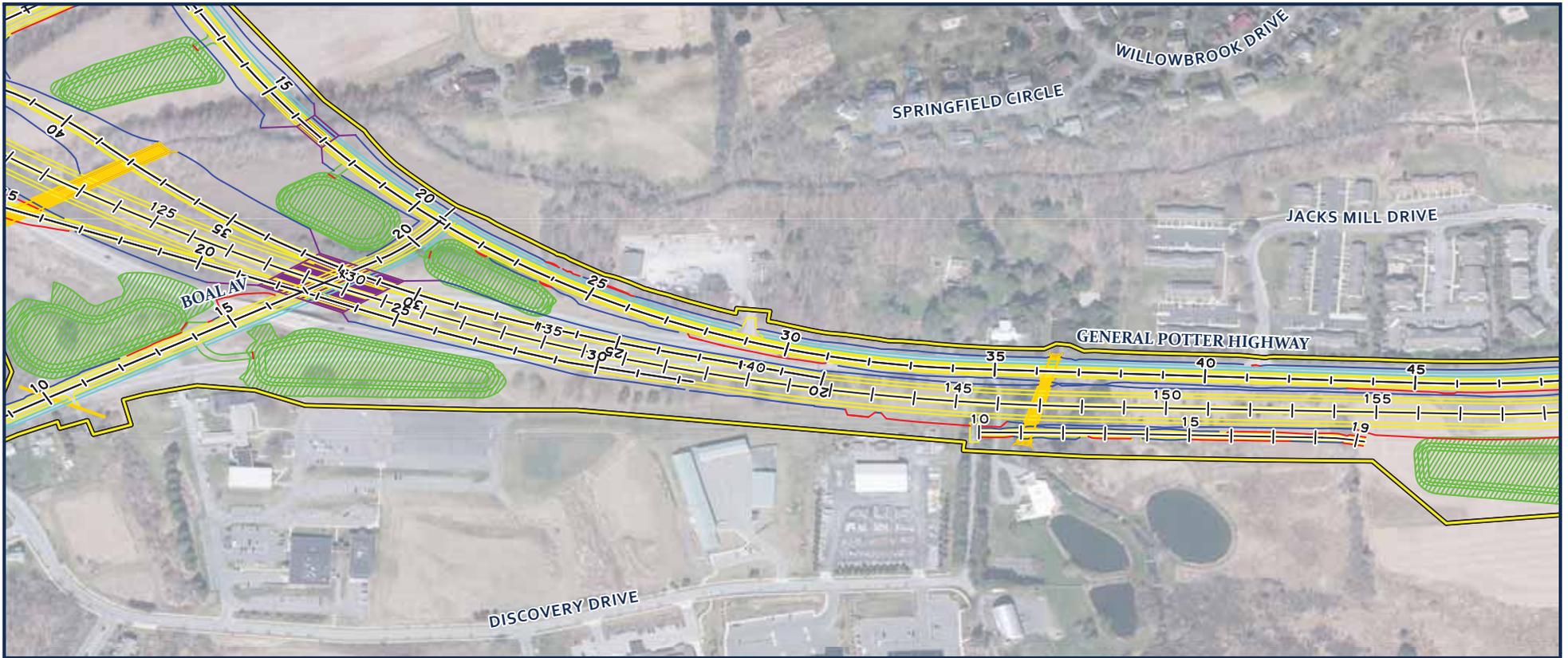
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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

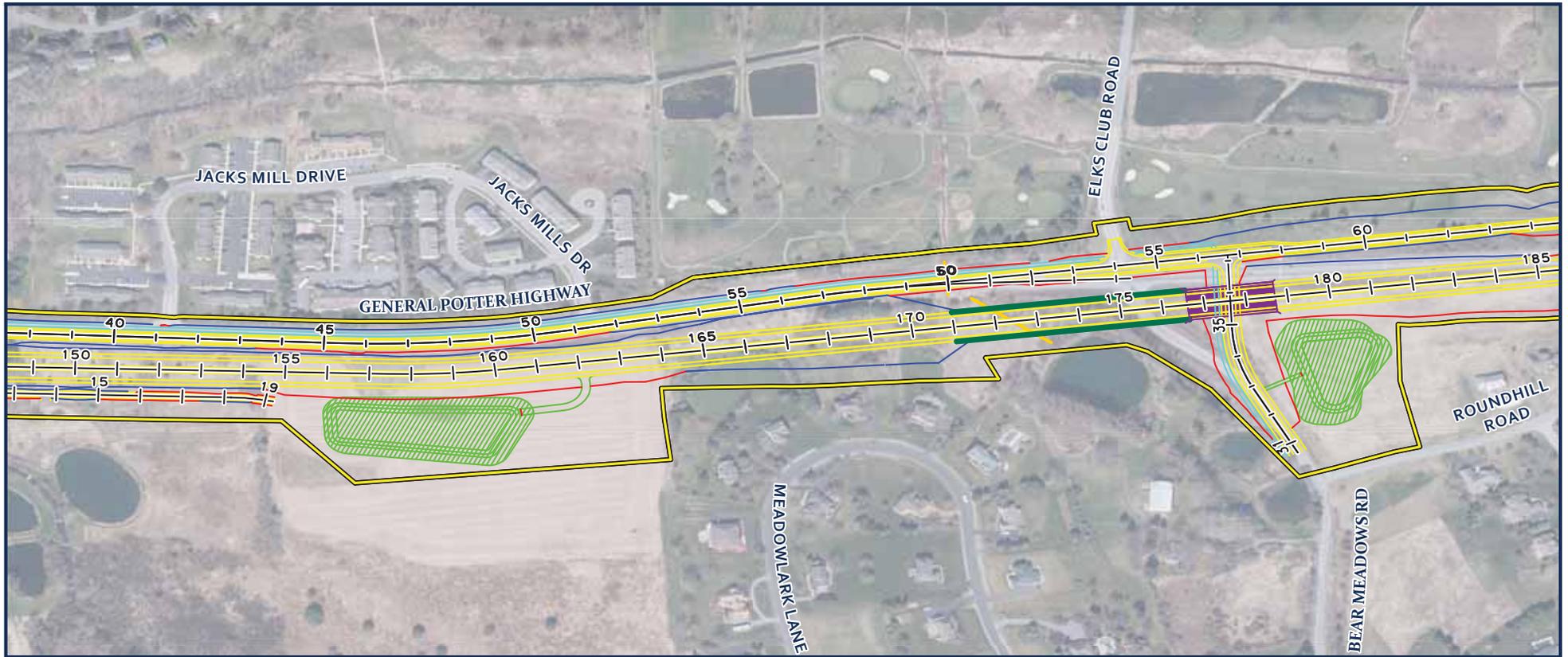


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0 0.05 0.1 Miles

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Figure 25

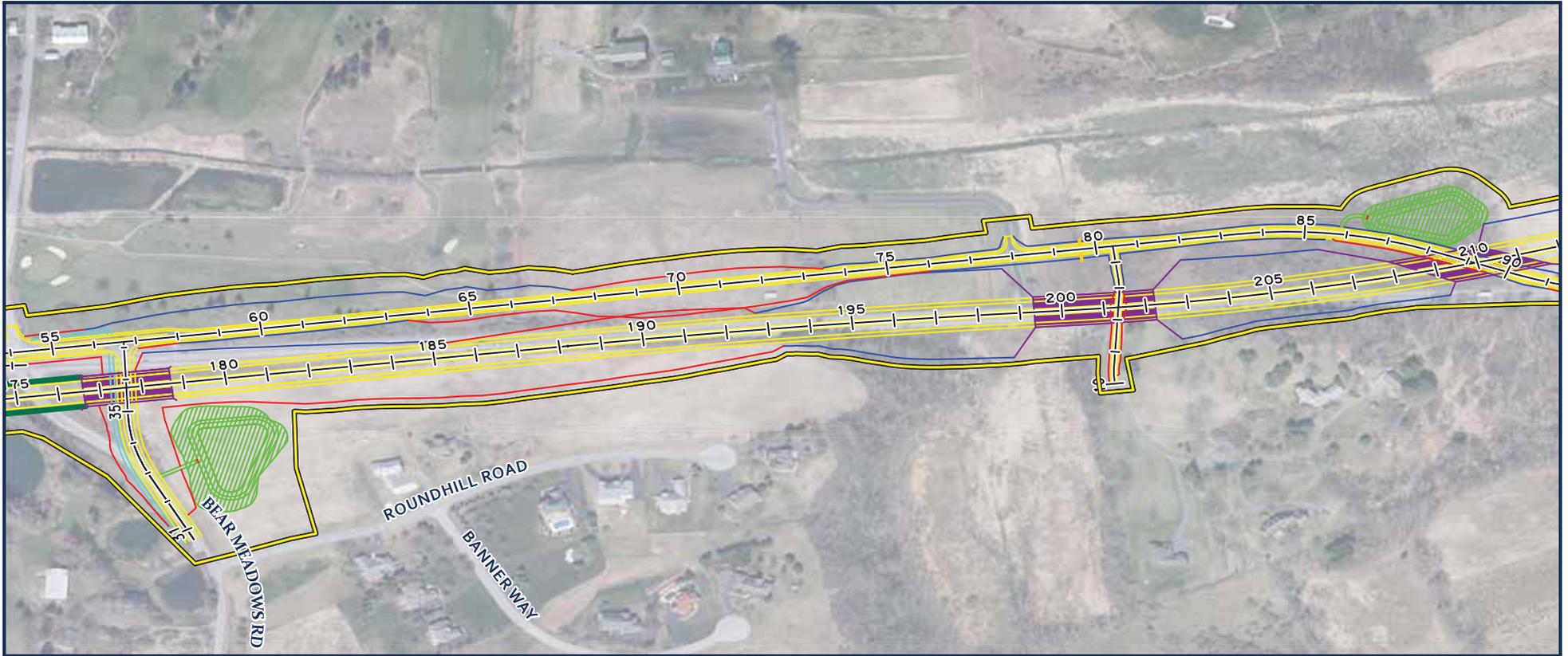


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25



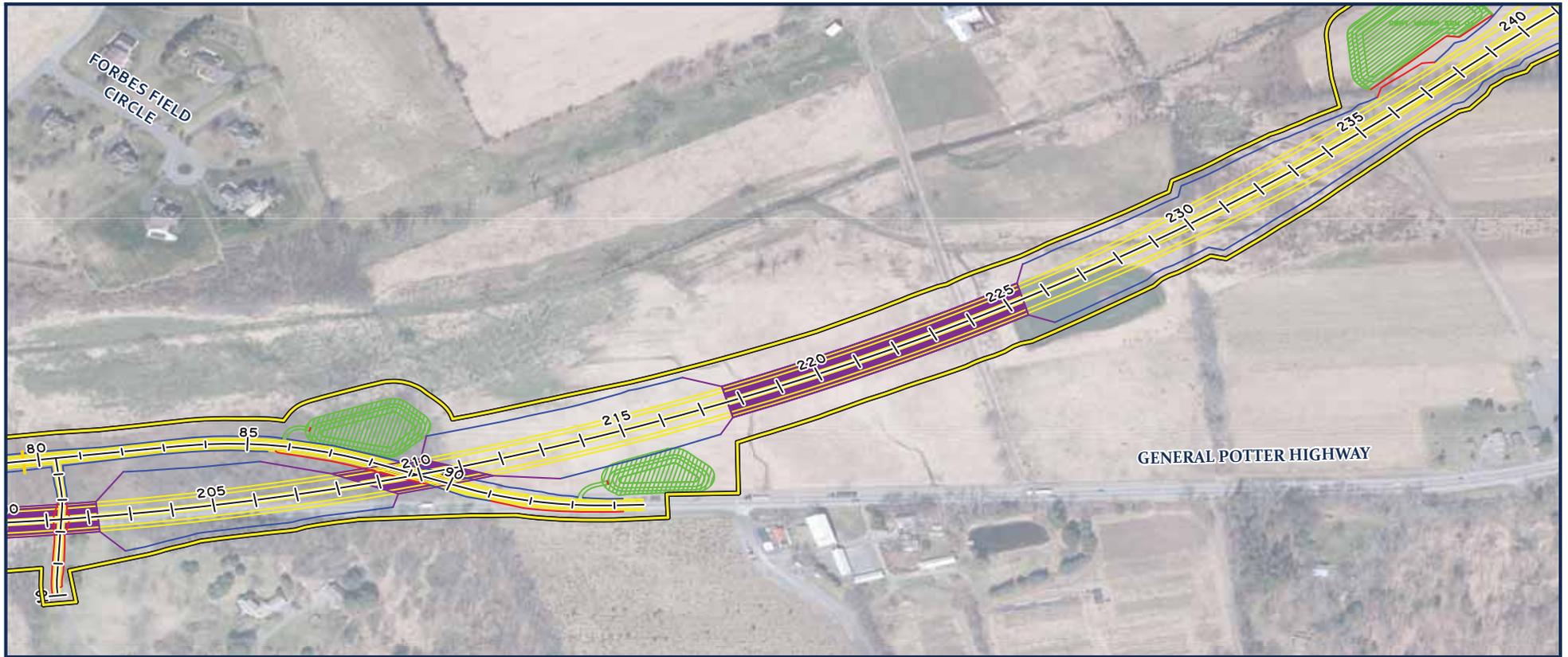
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0 0.05 0.1 Miles

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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

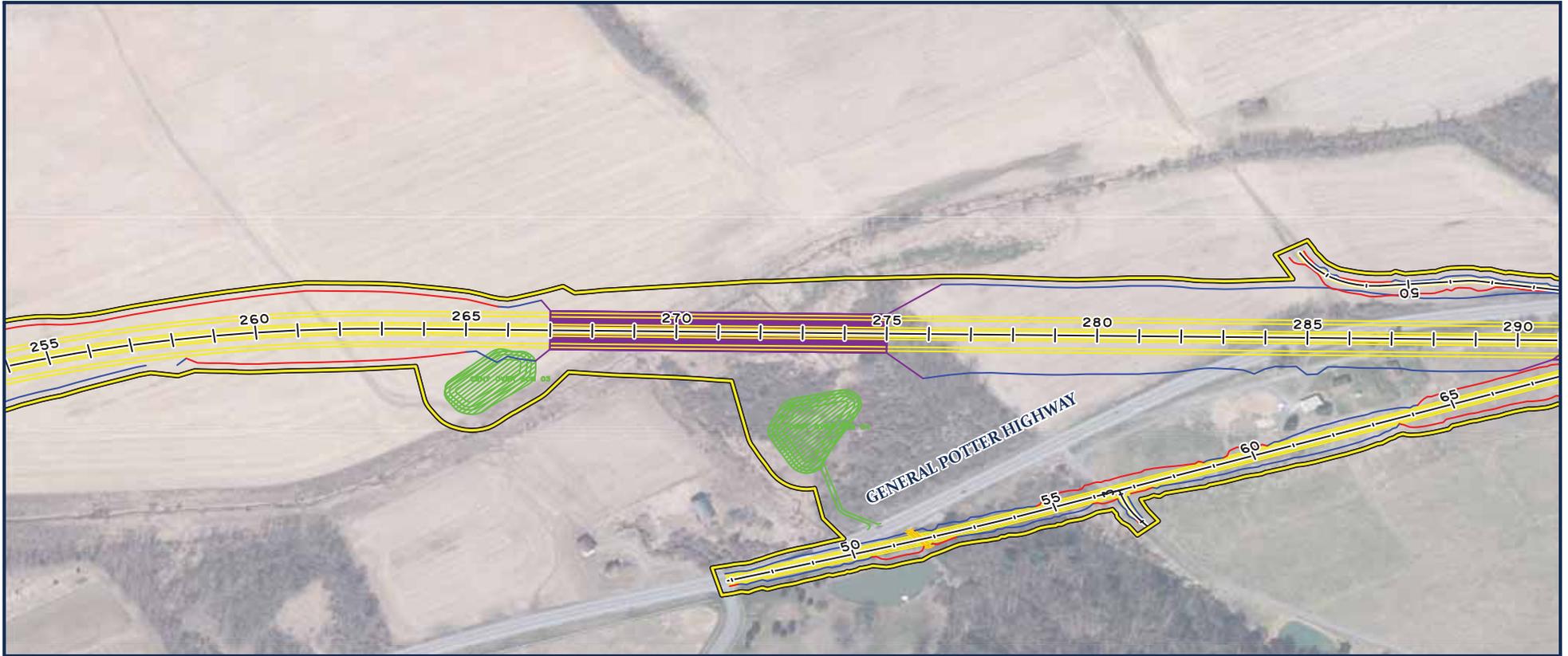


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

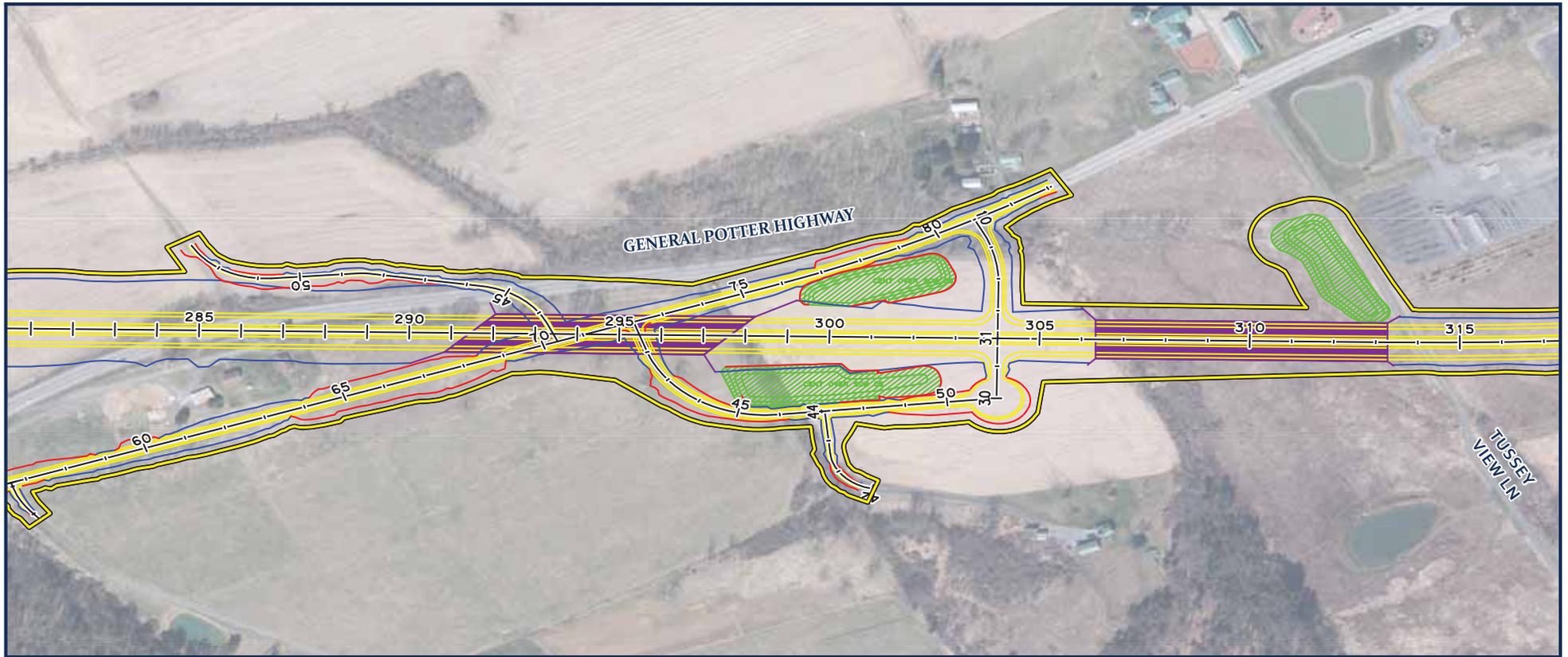


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Central Alternative Evaluated in the EIS  
Figure 25

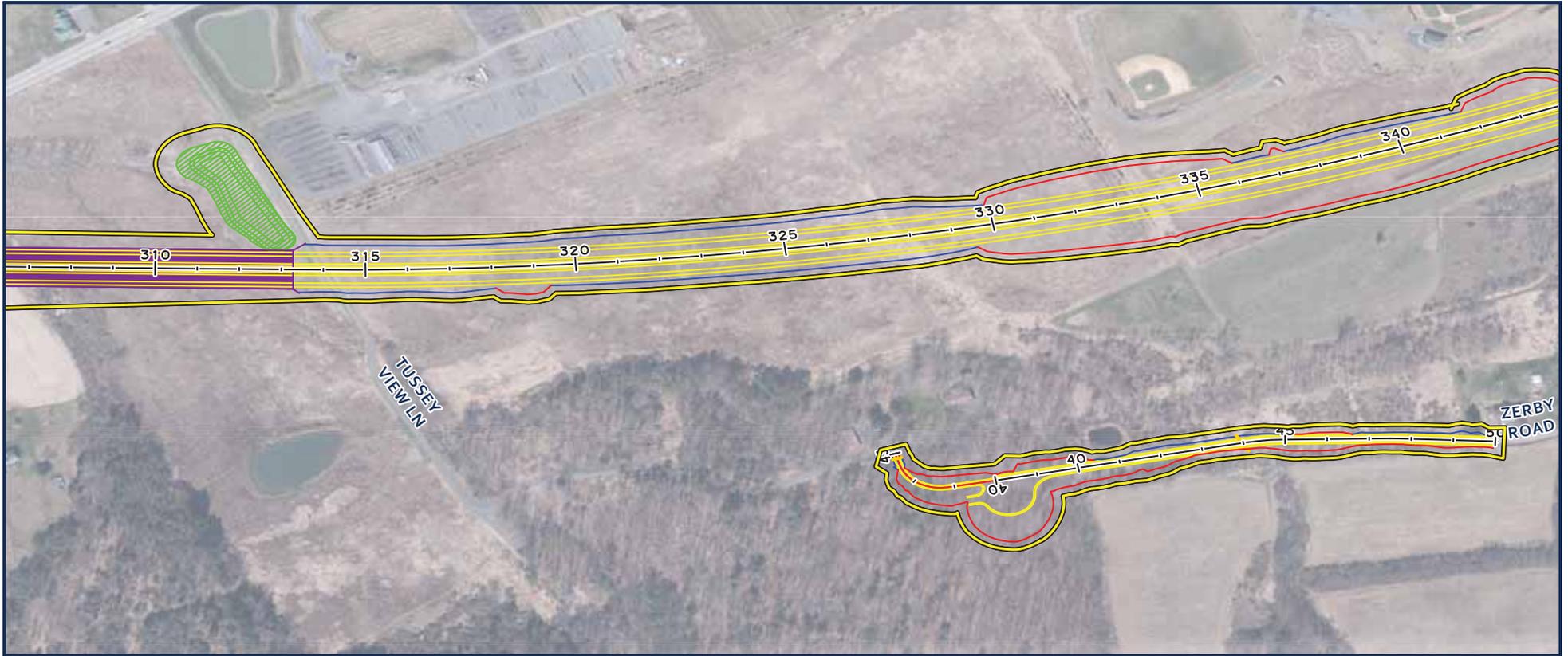


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

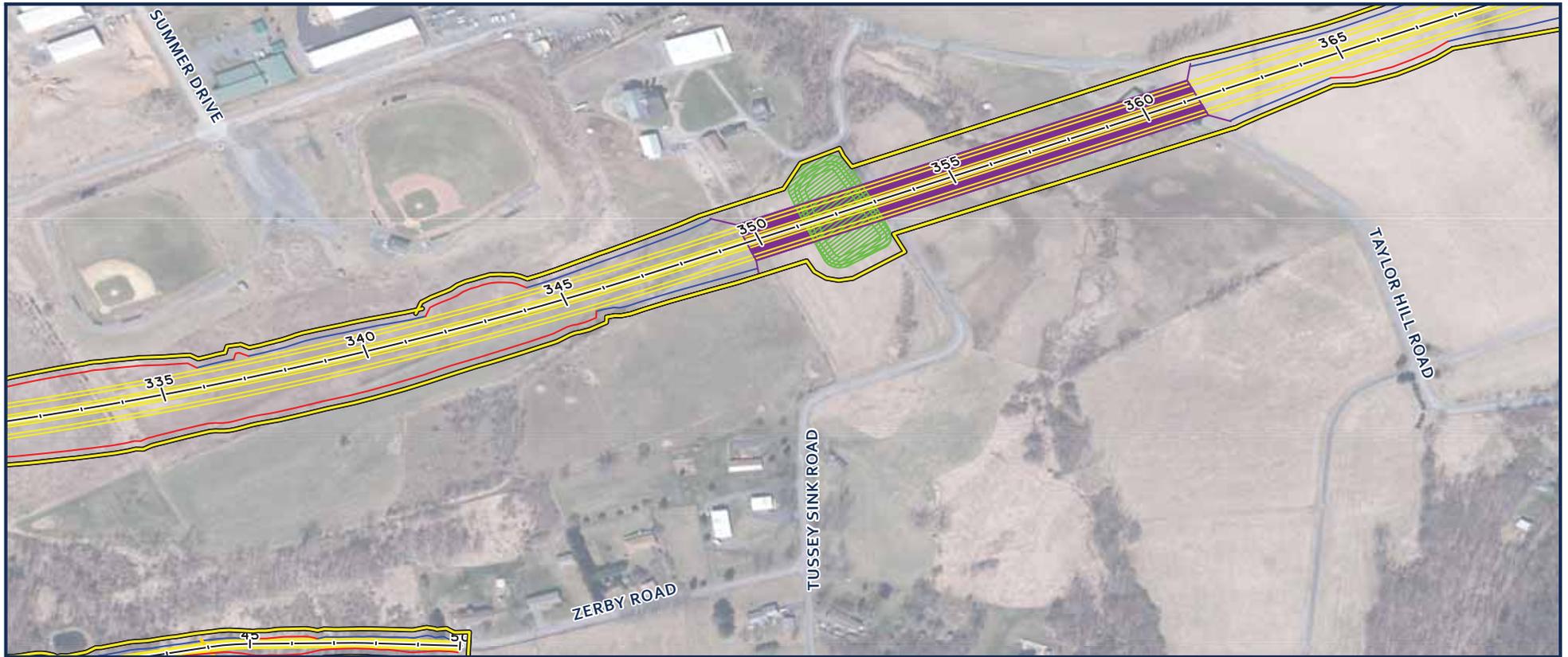


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

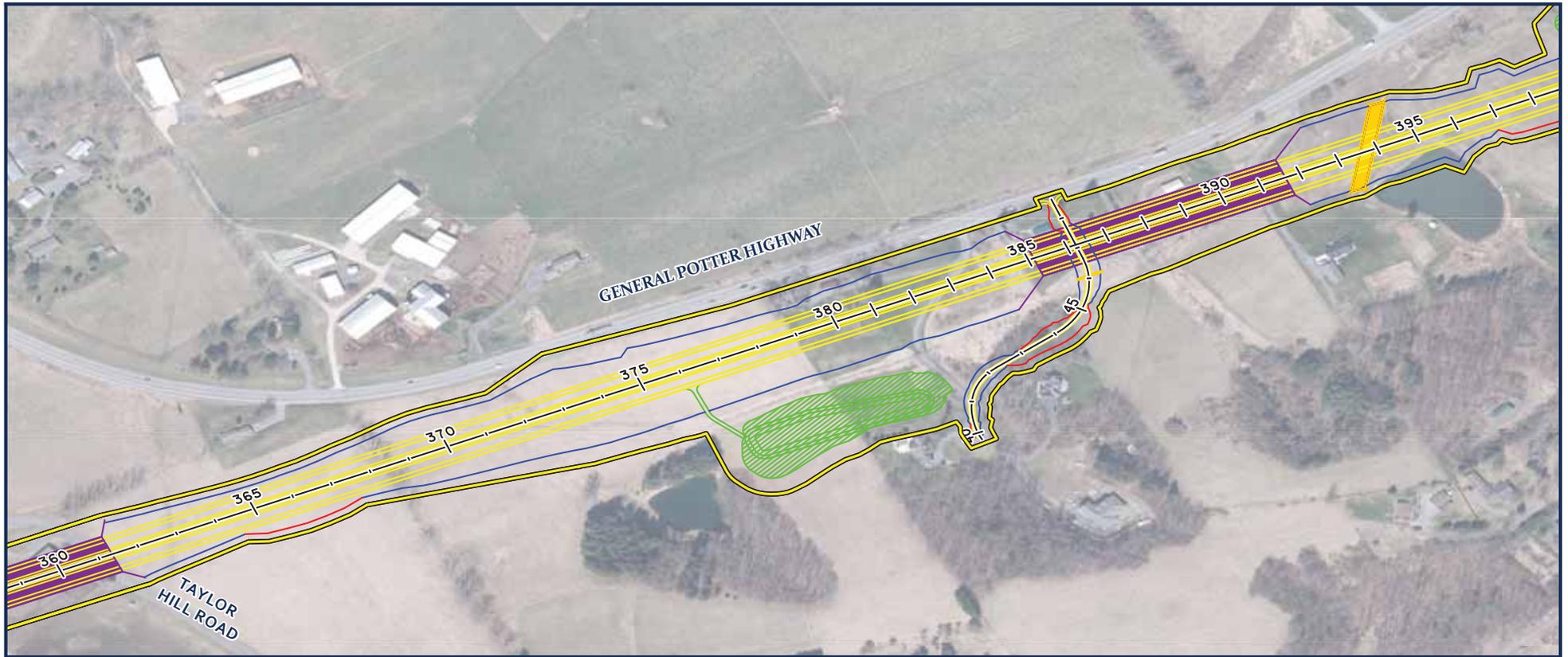


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

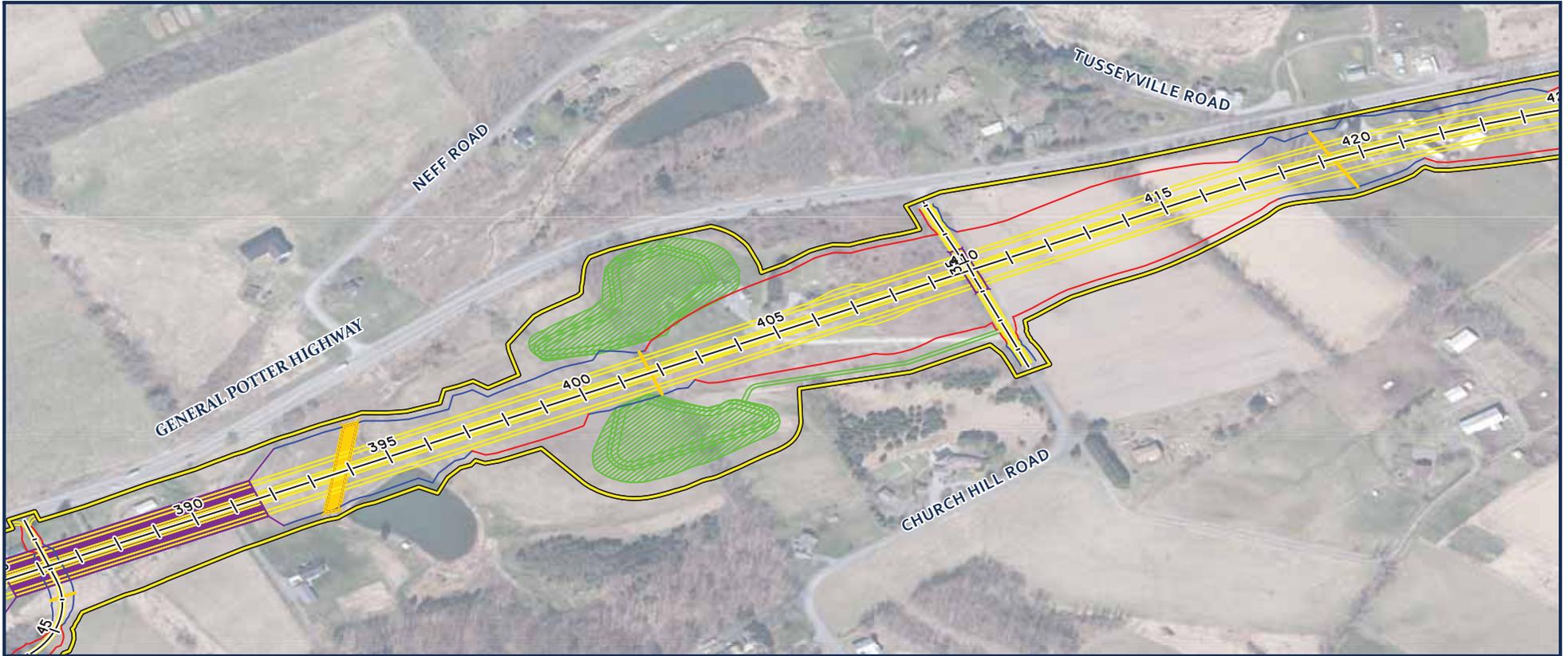


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

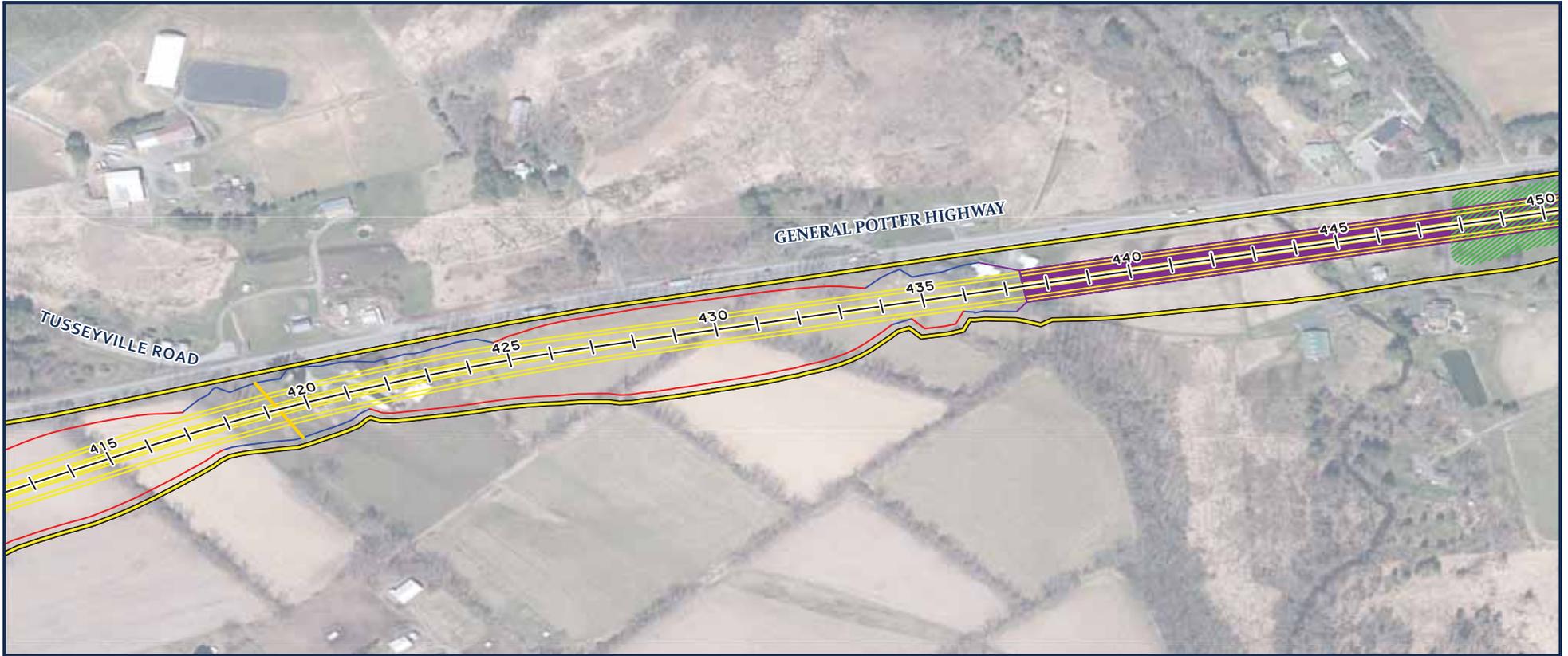


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

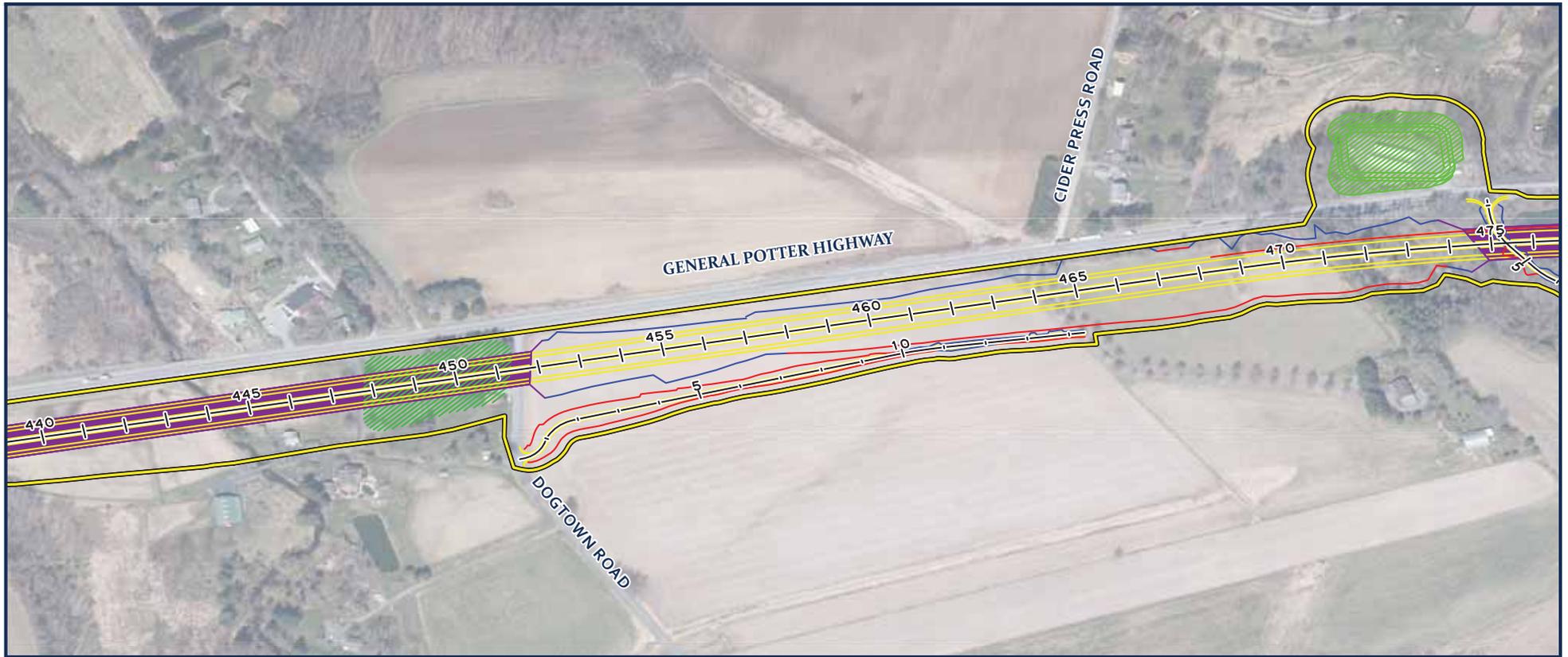


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

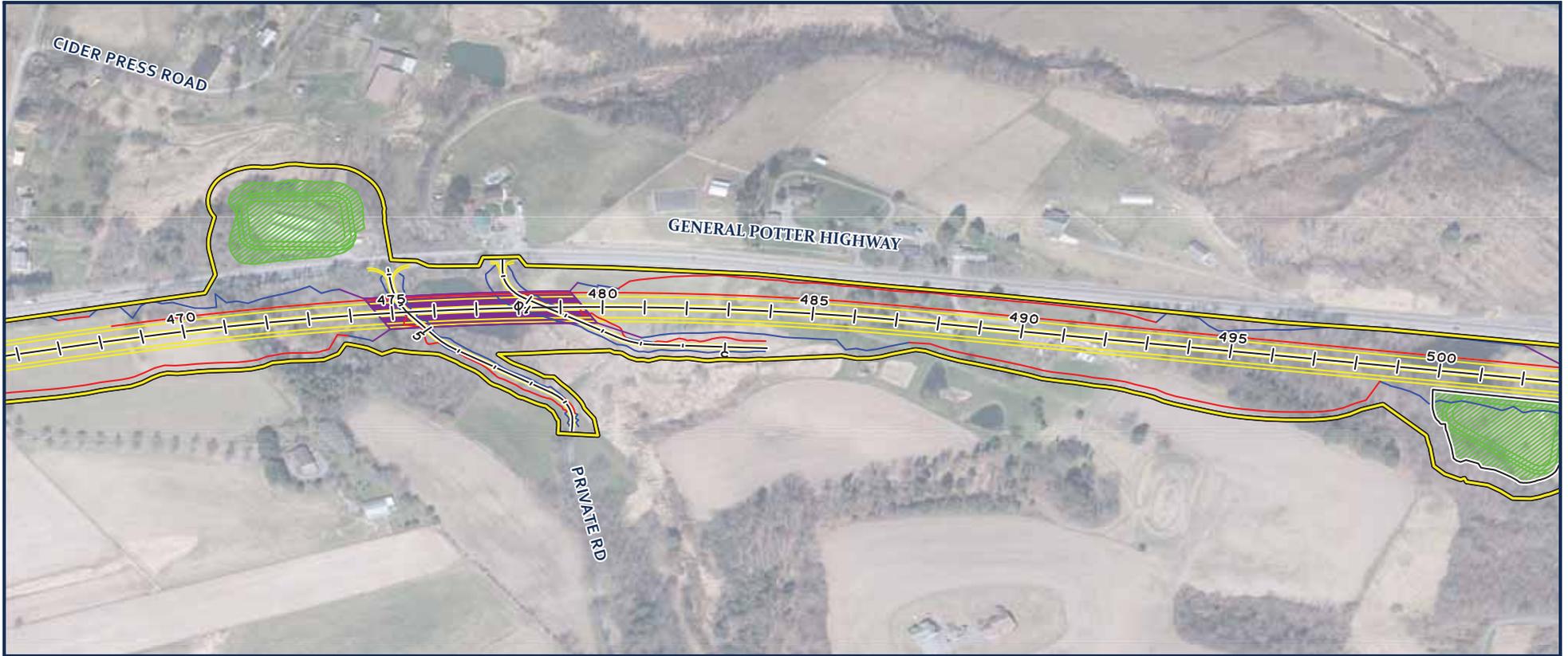


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

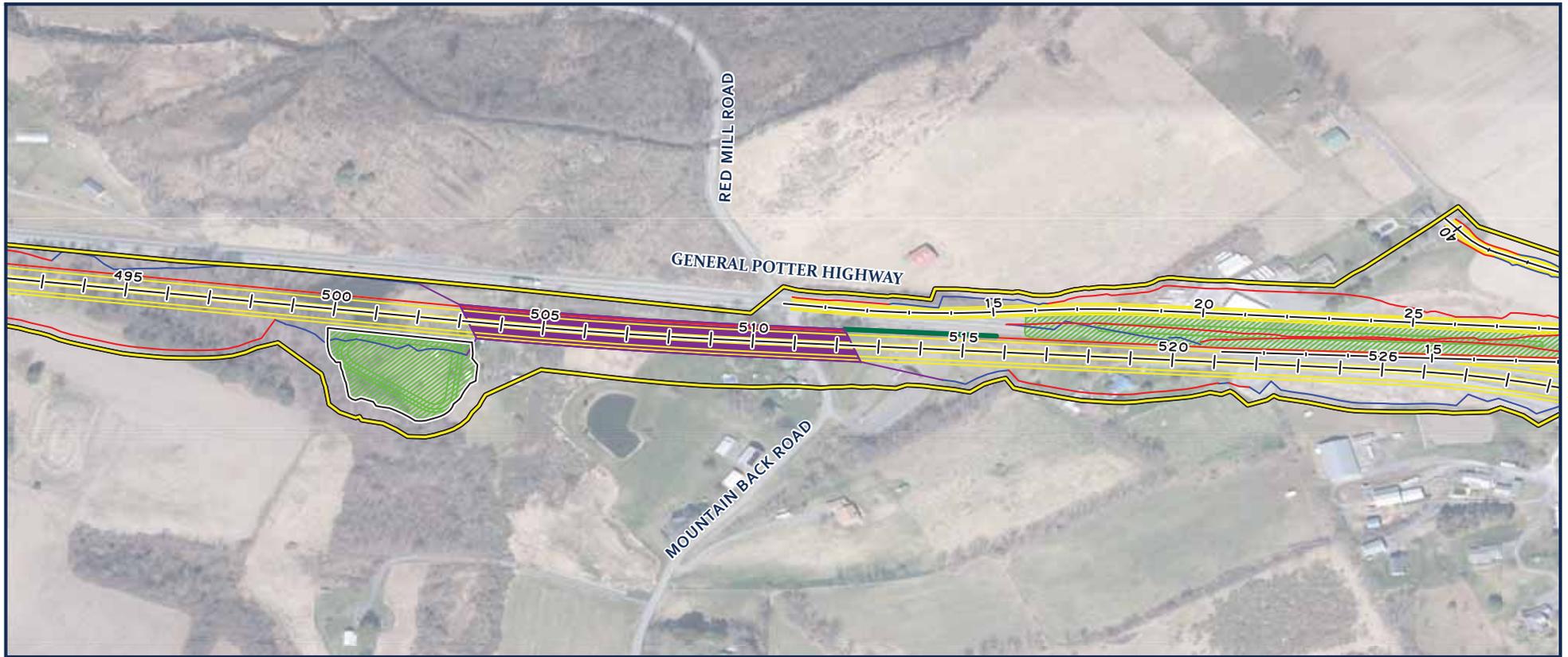


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25

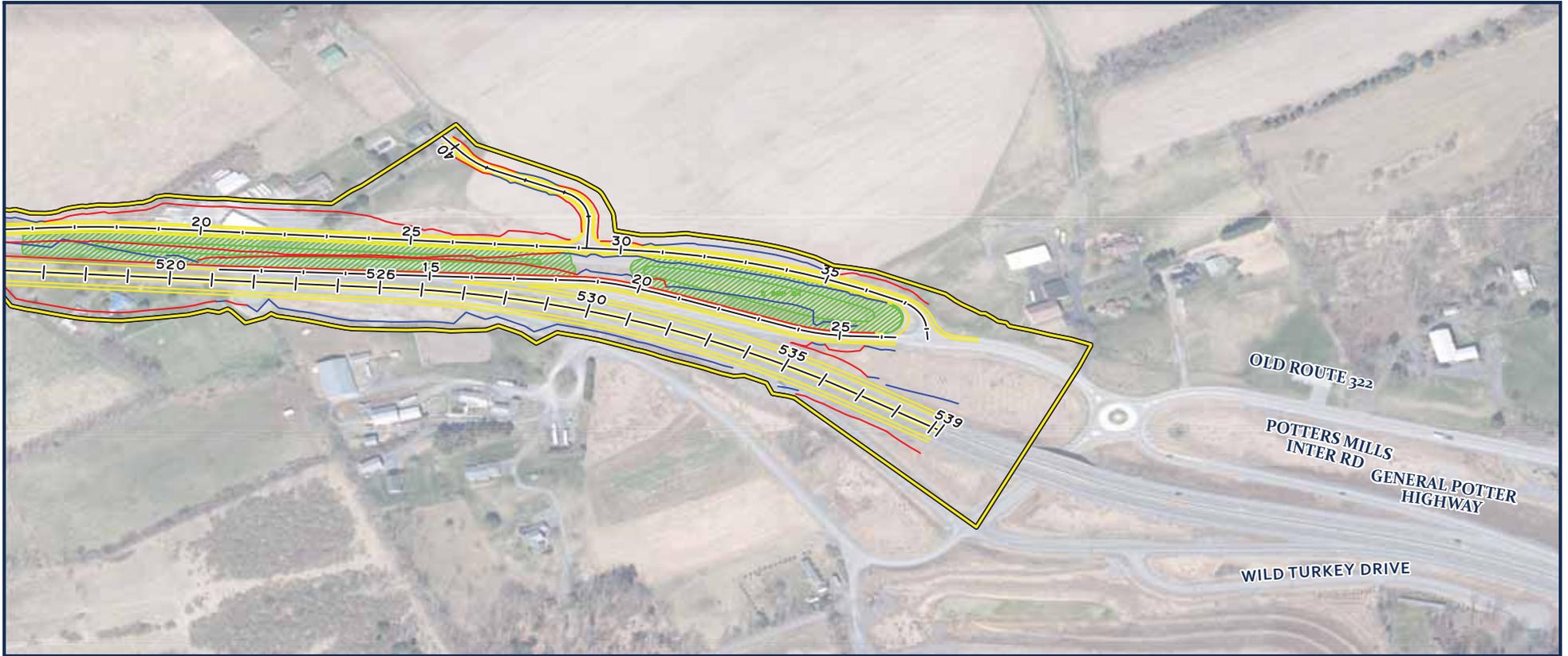


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0 0.05 0.1 Miles

Central Alternative Evaluated in the EIS  
Figure 25



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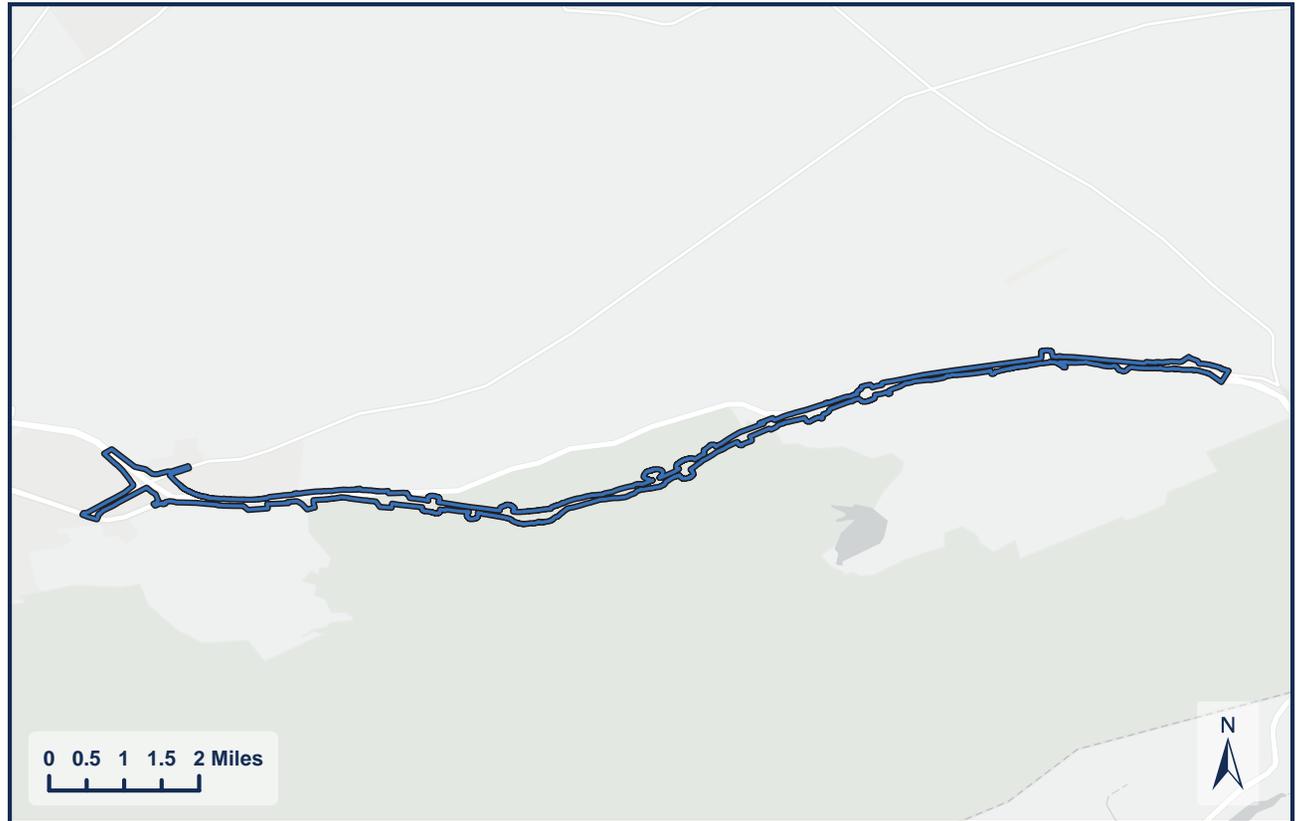


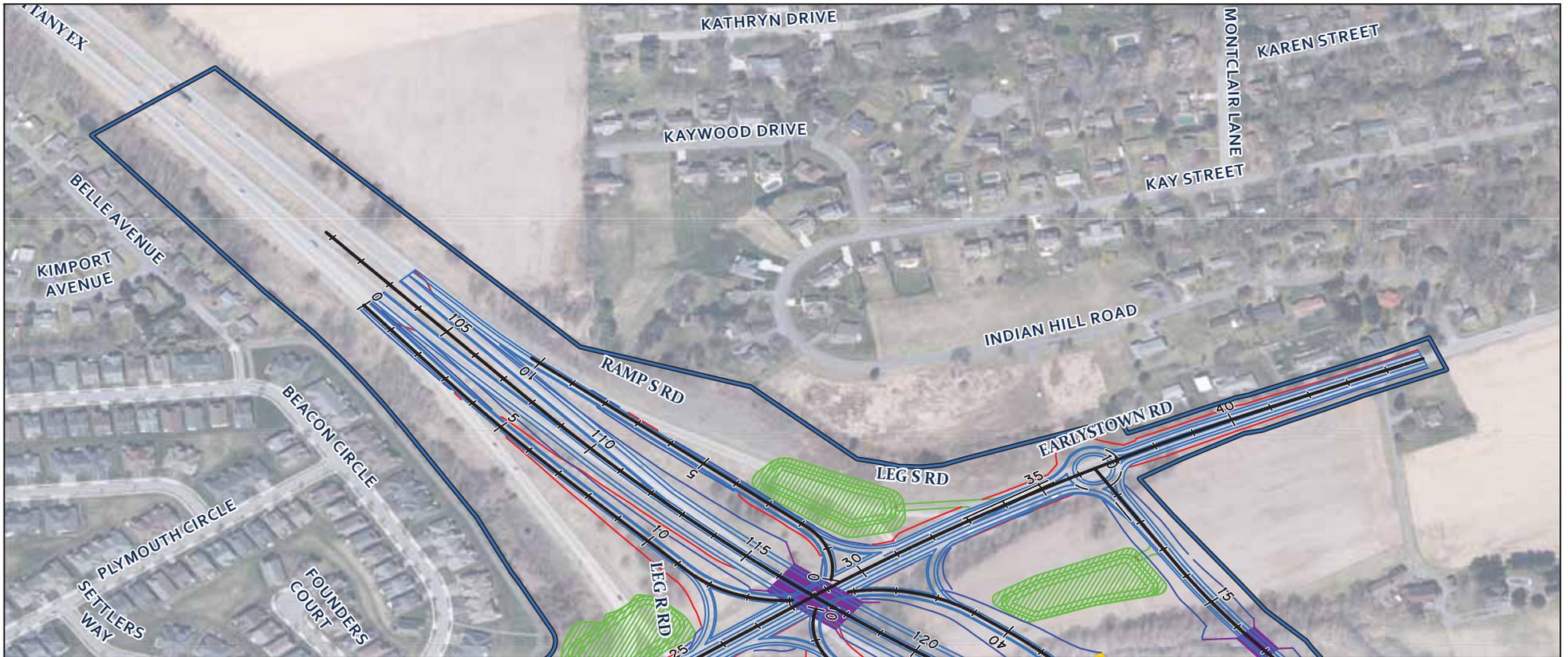
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SOUTH ALTERNATIVE EVALUATED IN THE EIS  
**Figure 26**

Legend

- Station Line and Number
- South Alternative Roadway Lane
- Cut
- Fill
- Shared-use Path
- Retaining Wall
- Limit of Disturbance
- Stormwater Pond
- Culvert/Pipe
- Bridge





0 0.05 0.1 Miles

South Alternative Evaluated in the EIS  
Figure #26



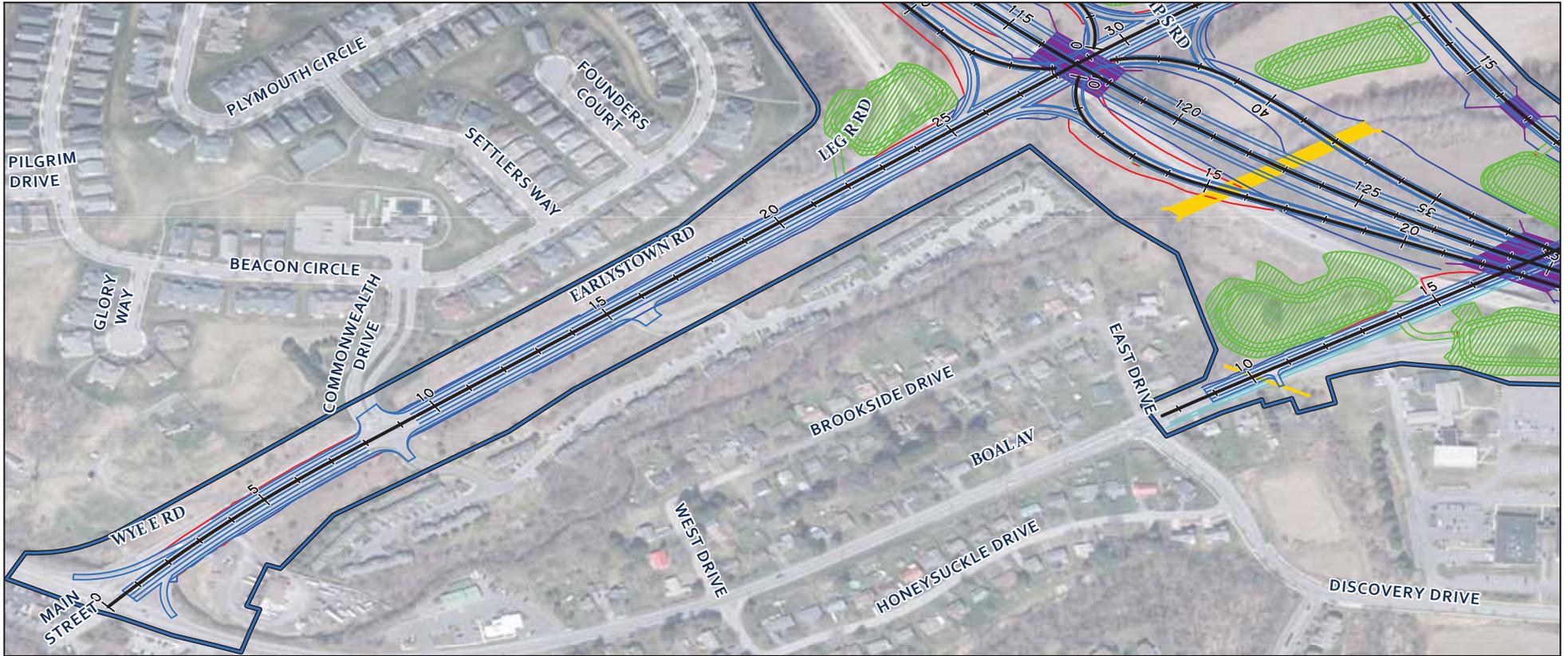
Pennsylvania  
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state college area  
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South Alternative Evaluated in the EIS  
Figure 26



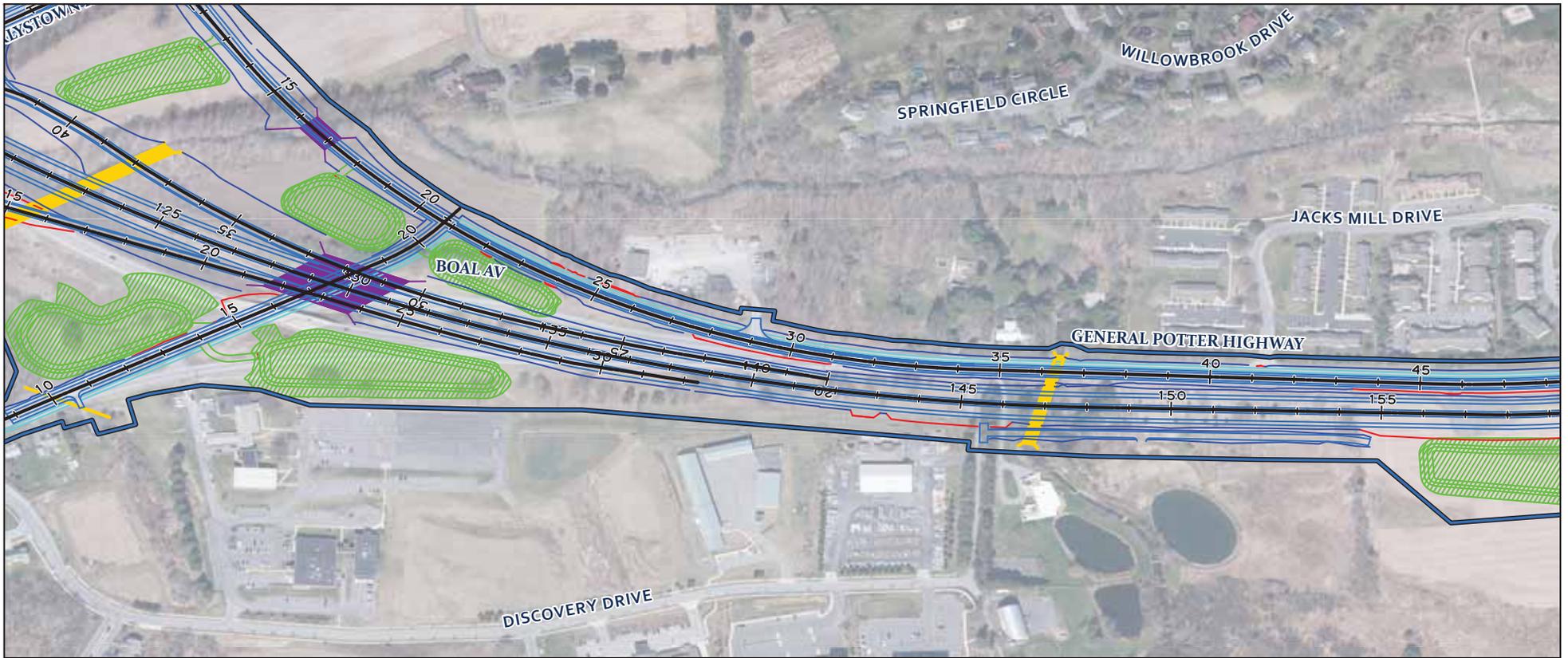
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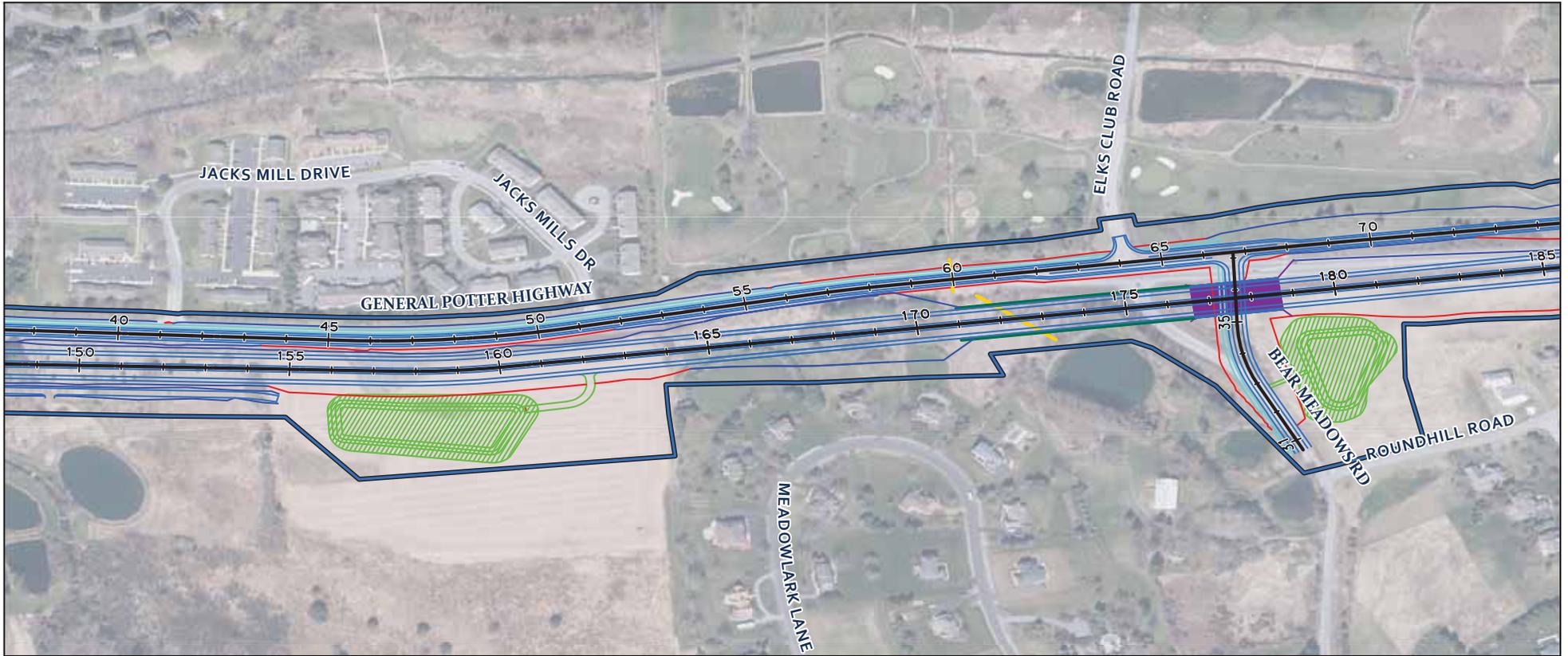


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0 0.05 0.1 Miles

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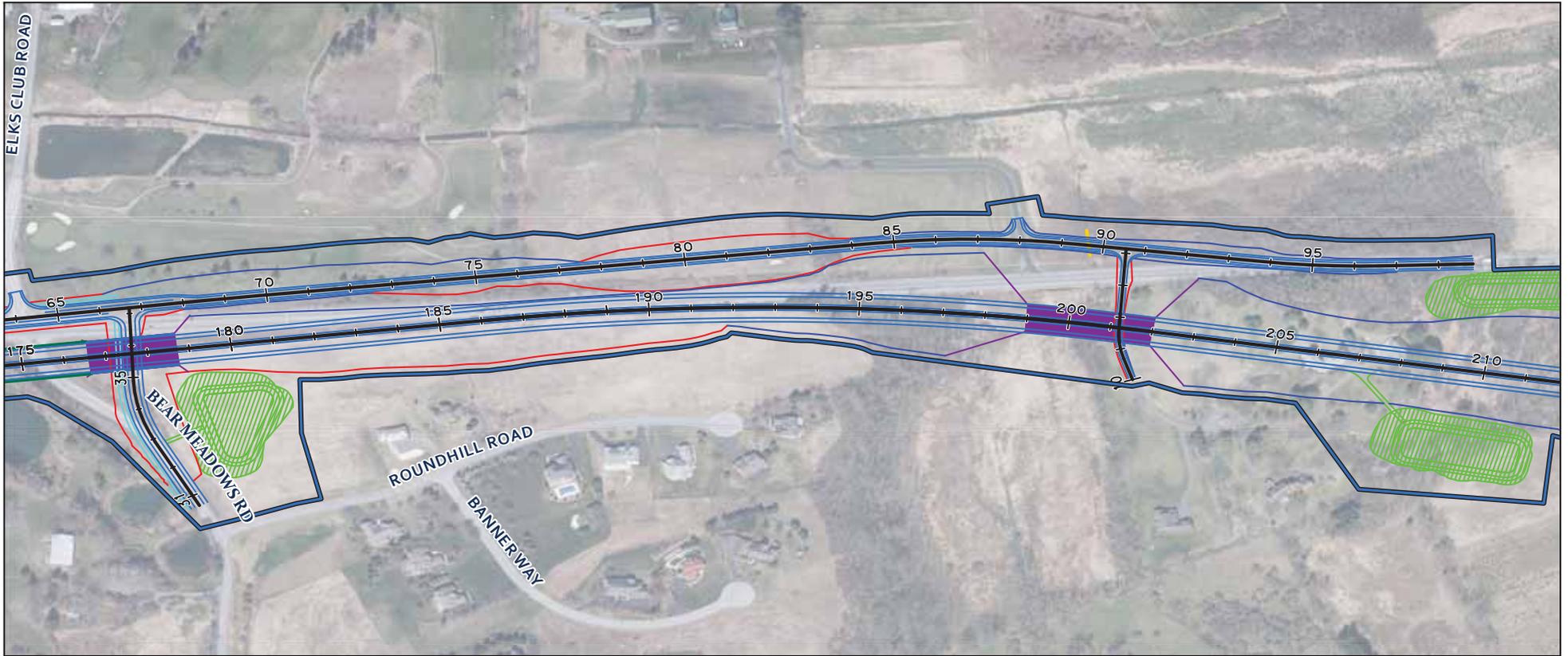


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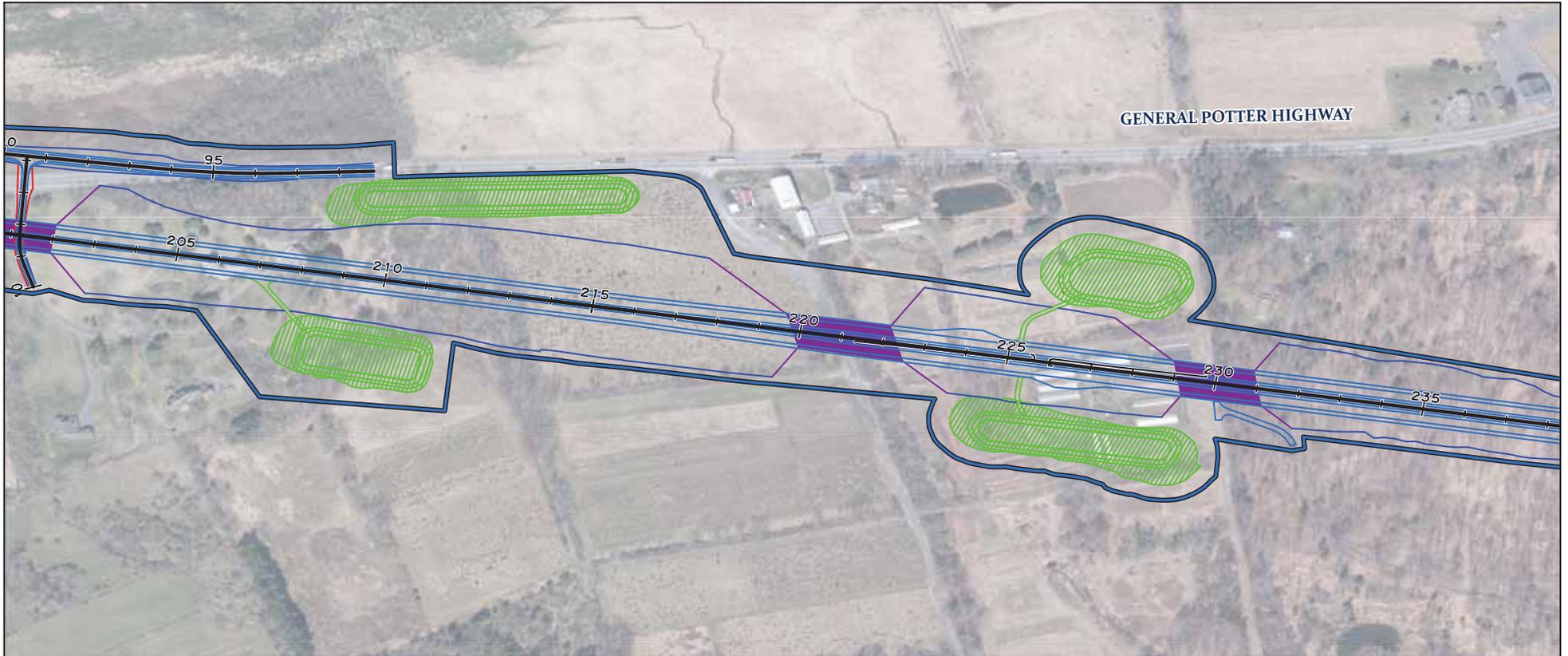
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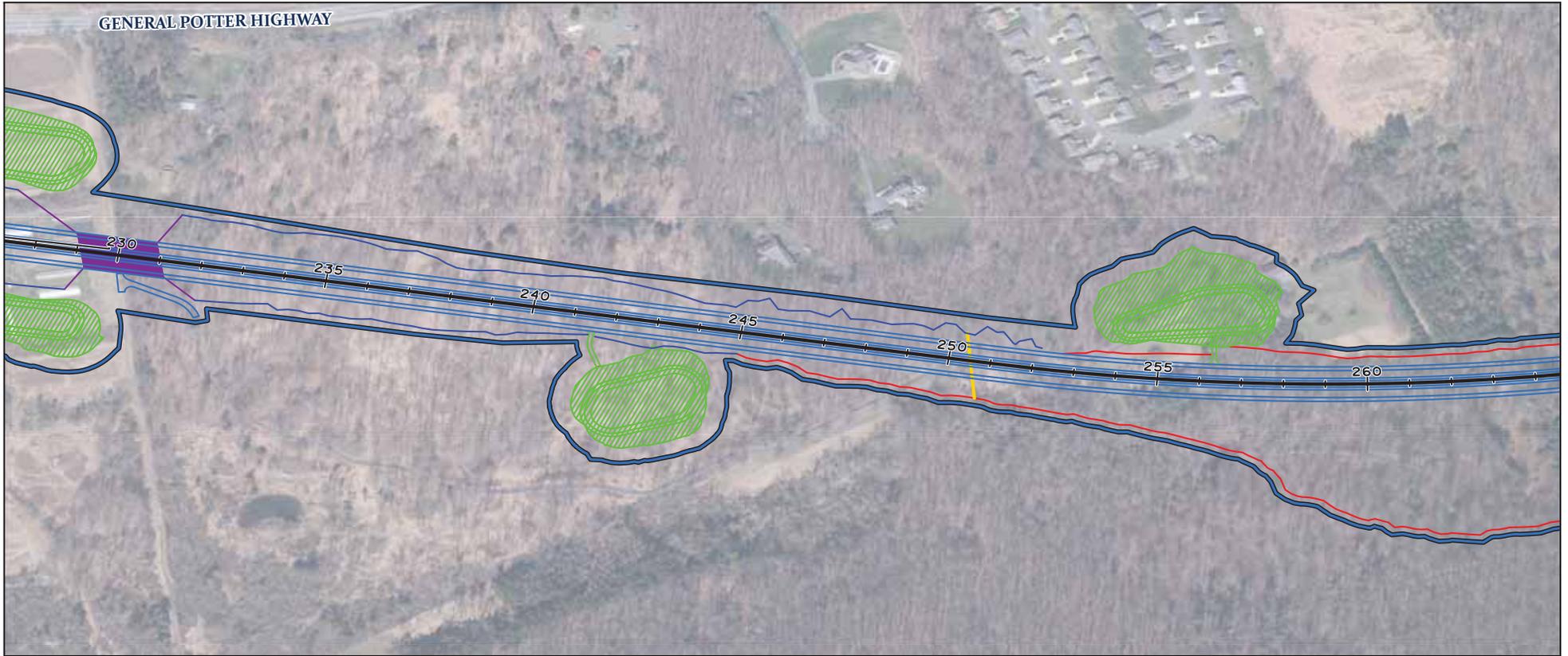
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South Alternative Evaluated in the EIS  
Figure 26

N



0 0.05 0.1 Miles

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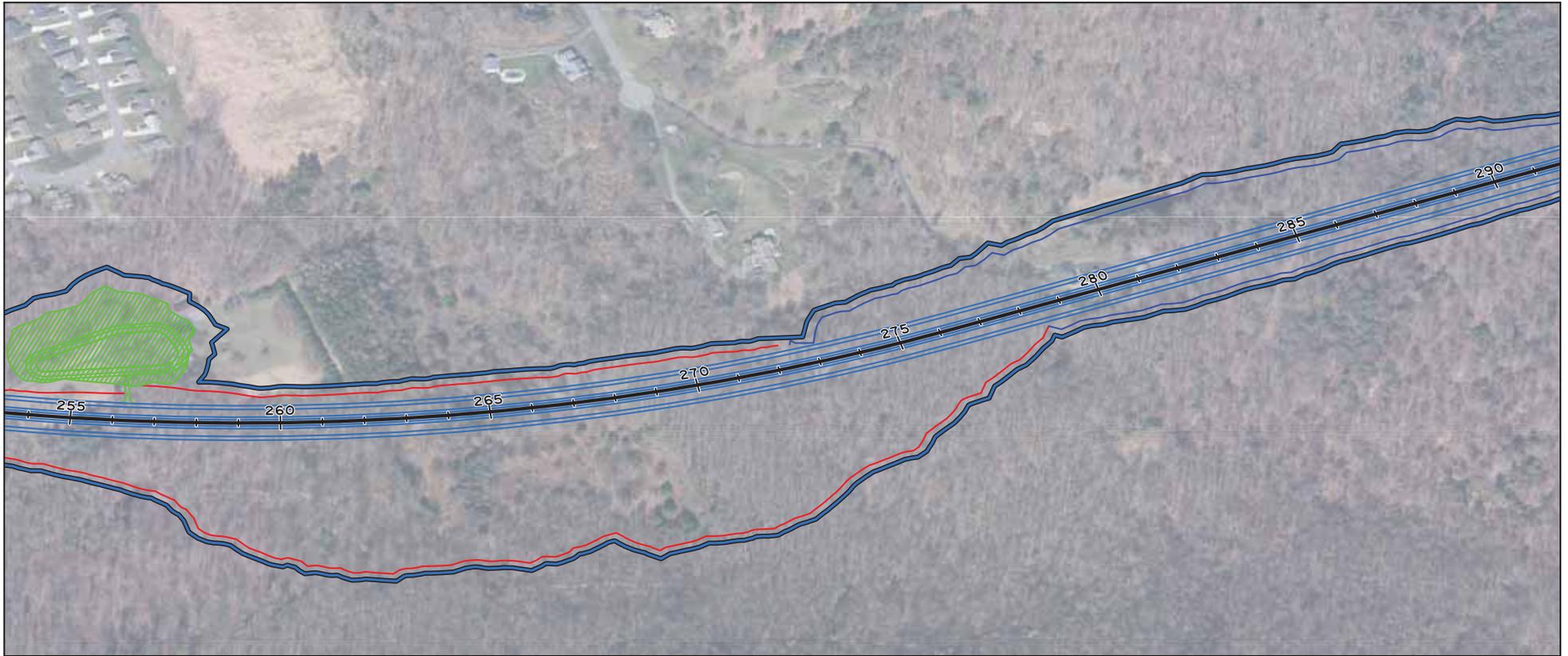


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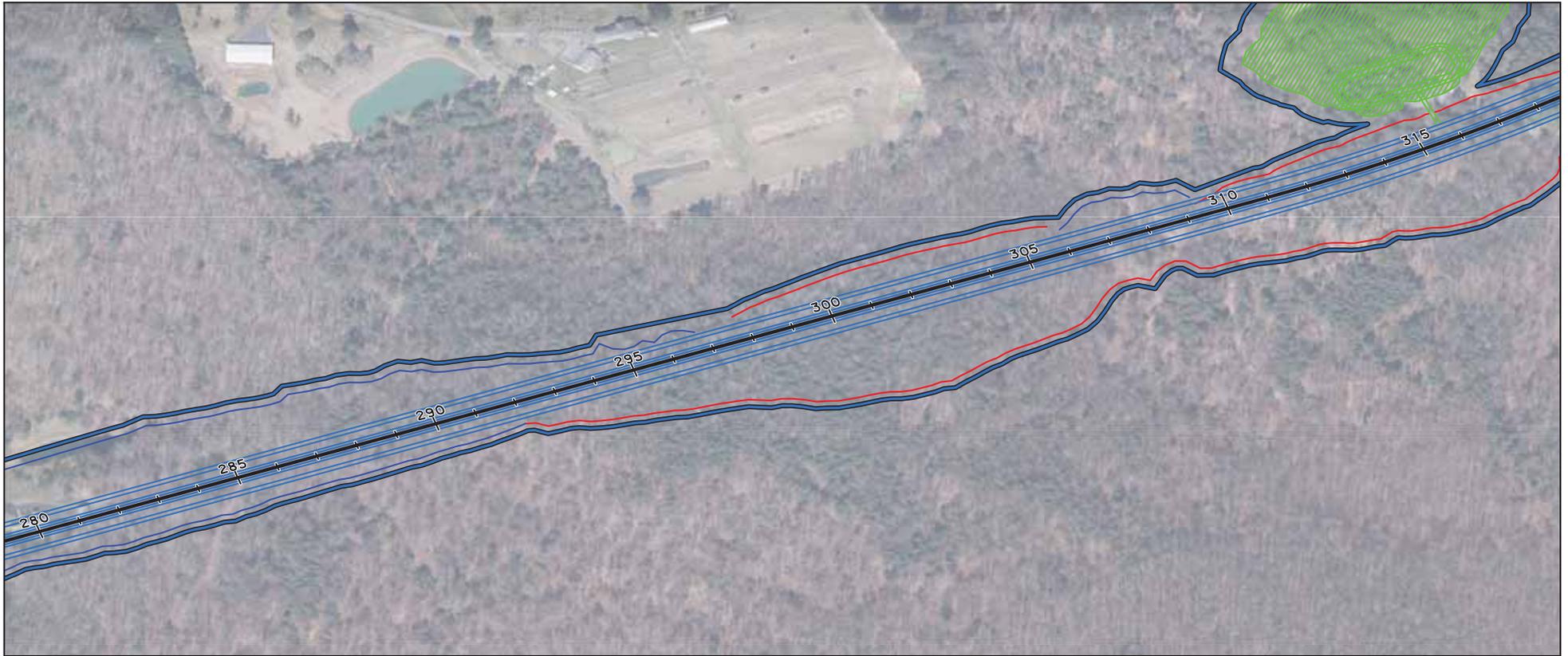


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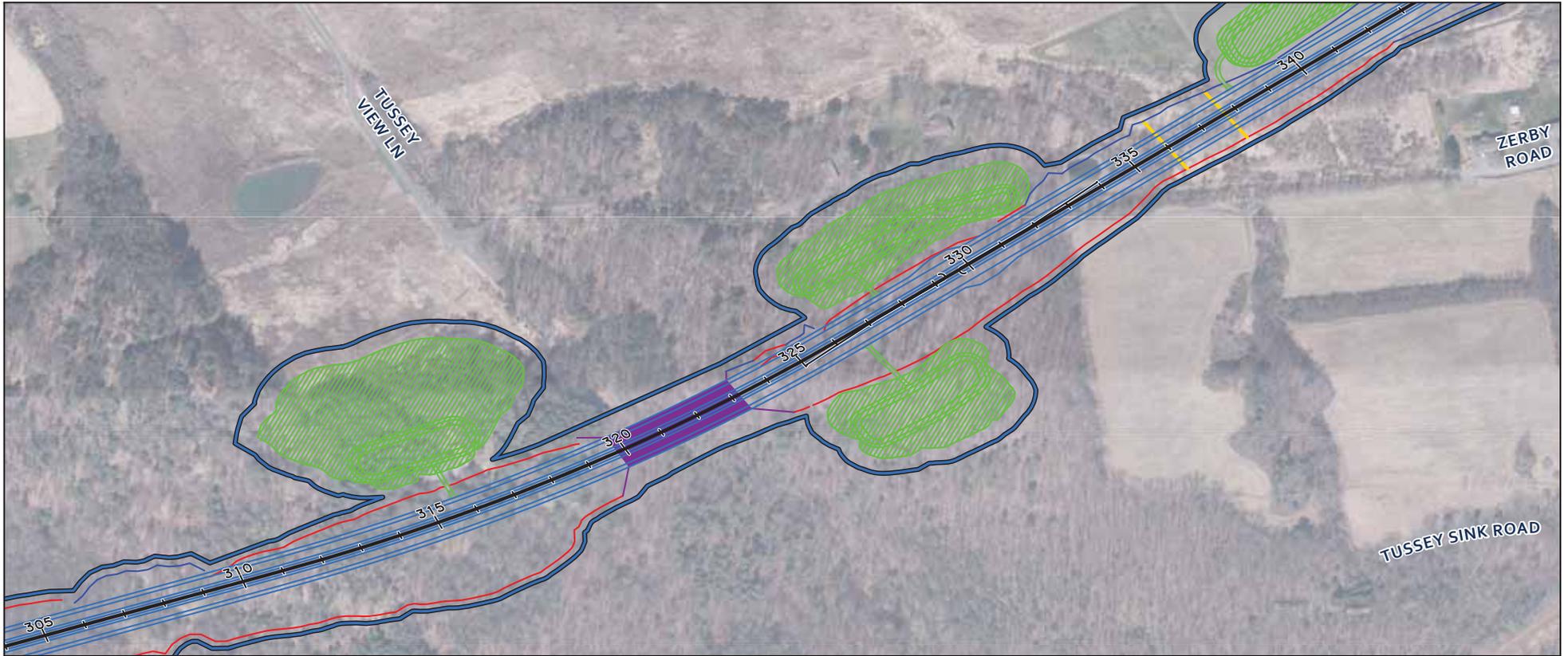


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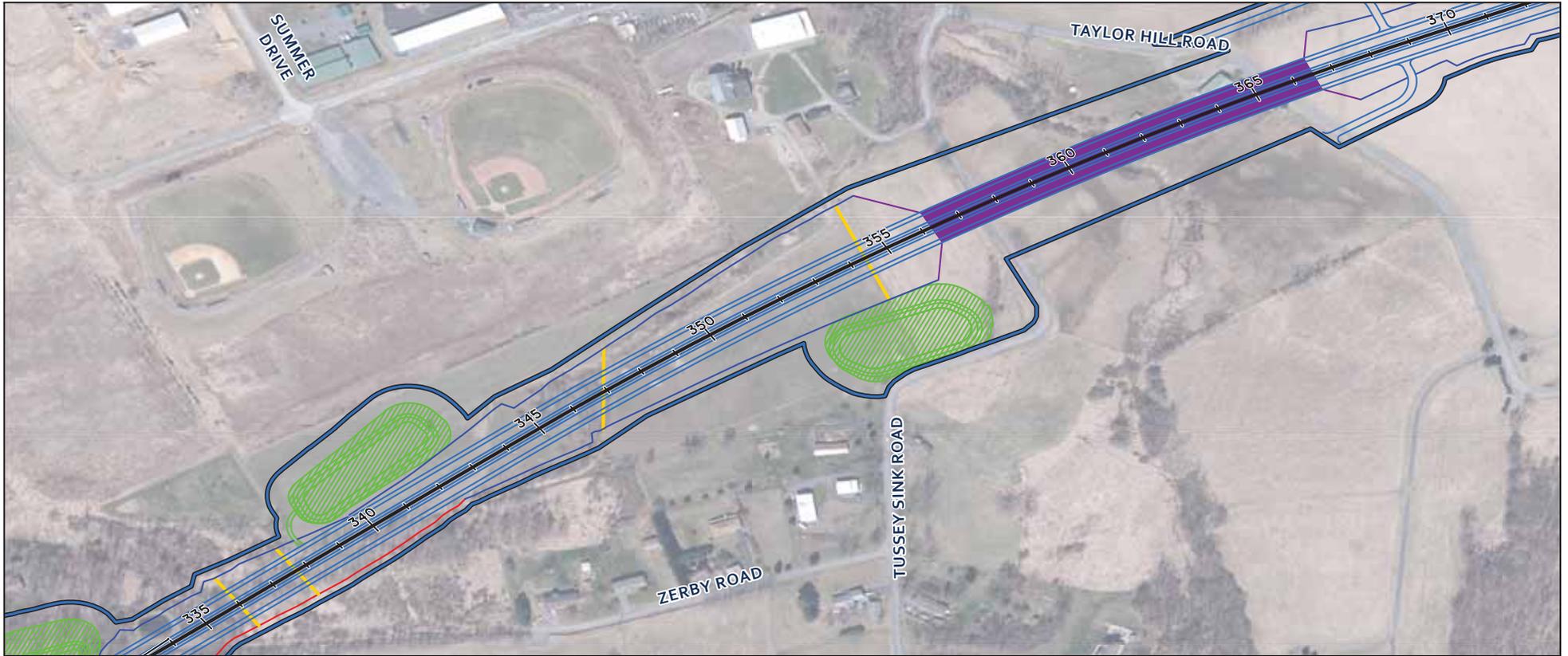


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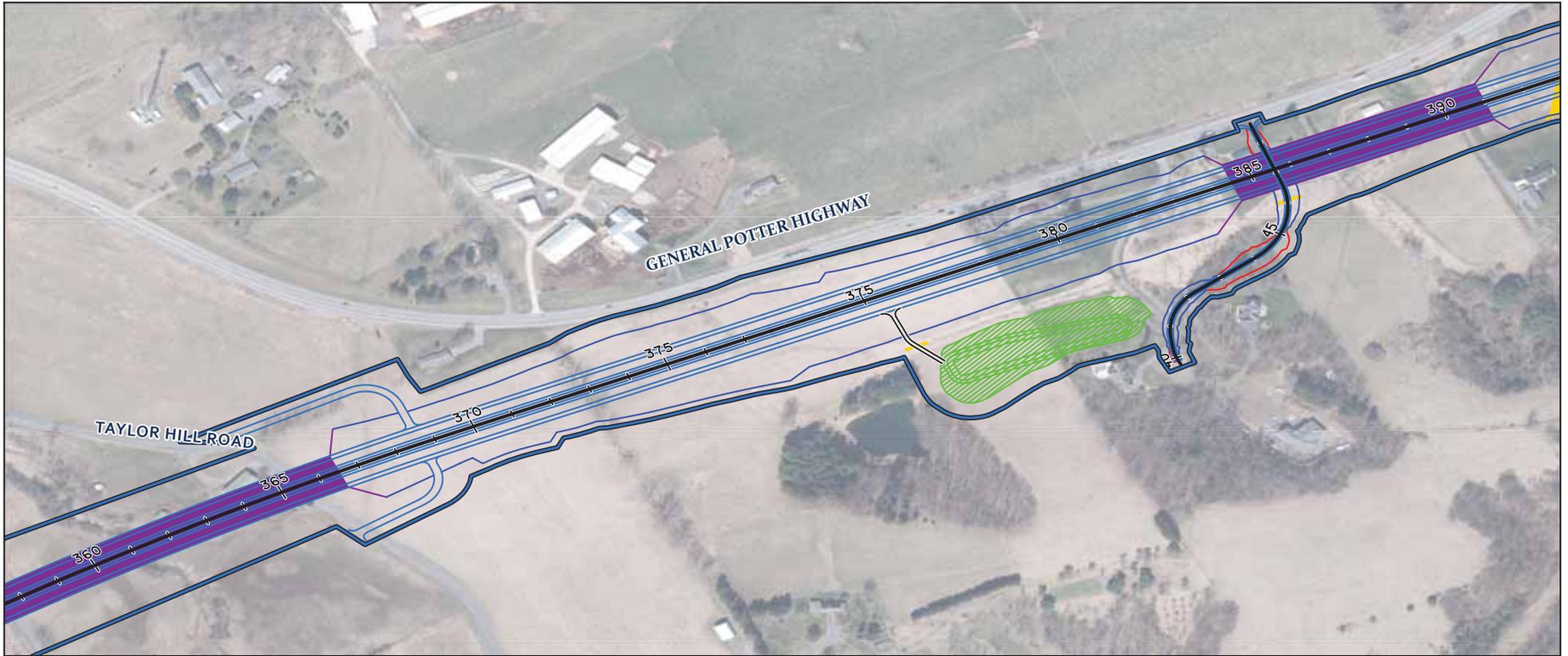


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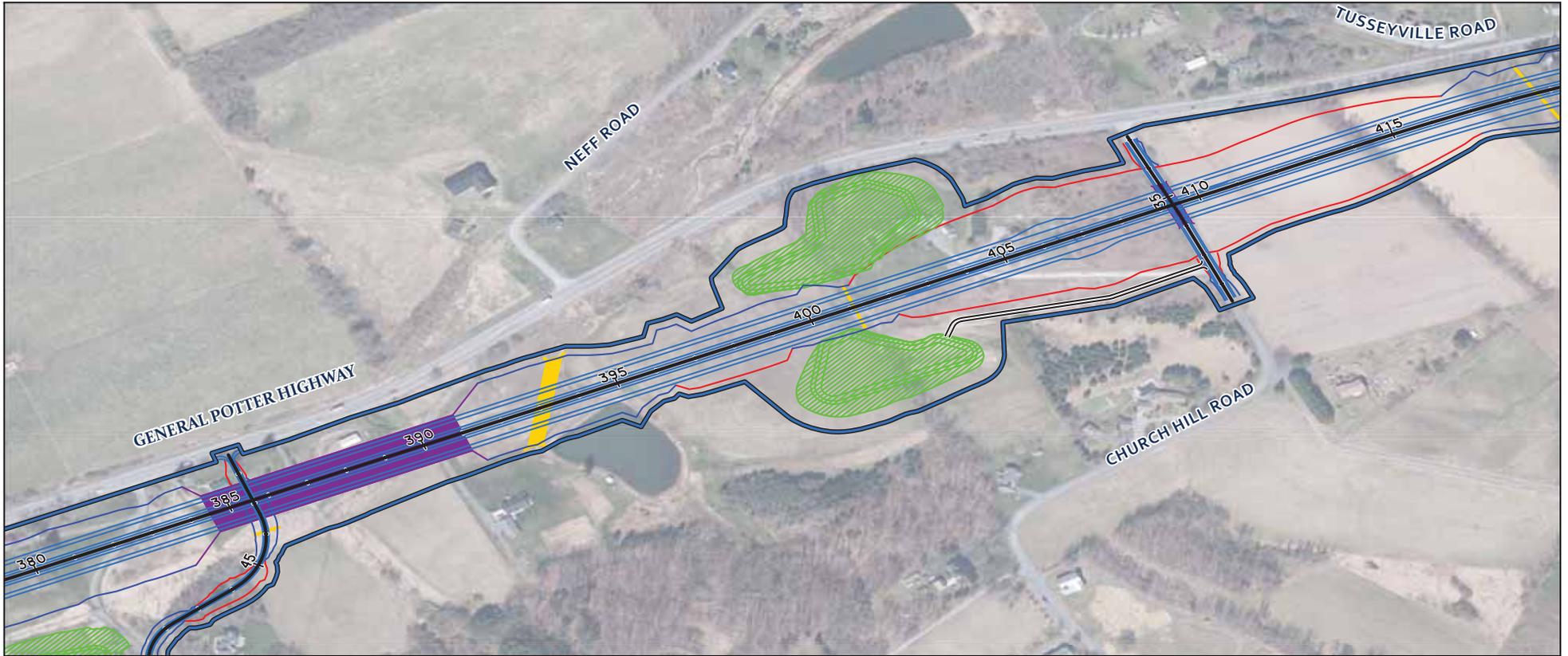


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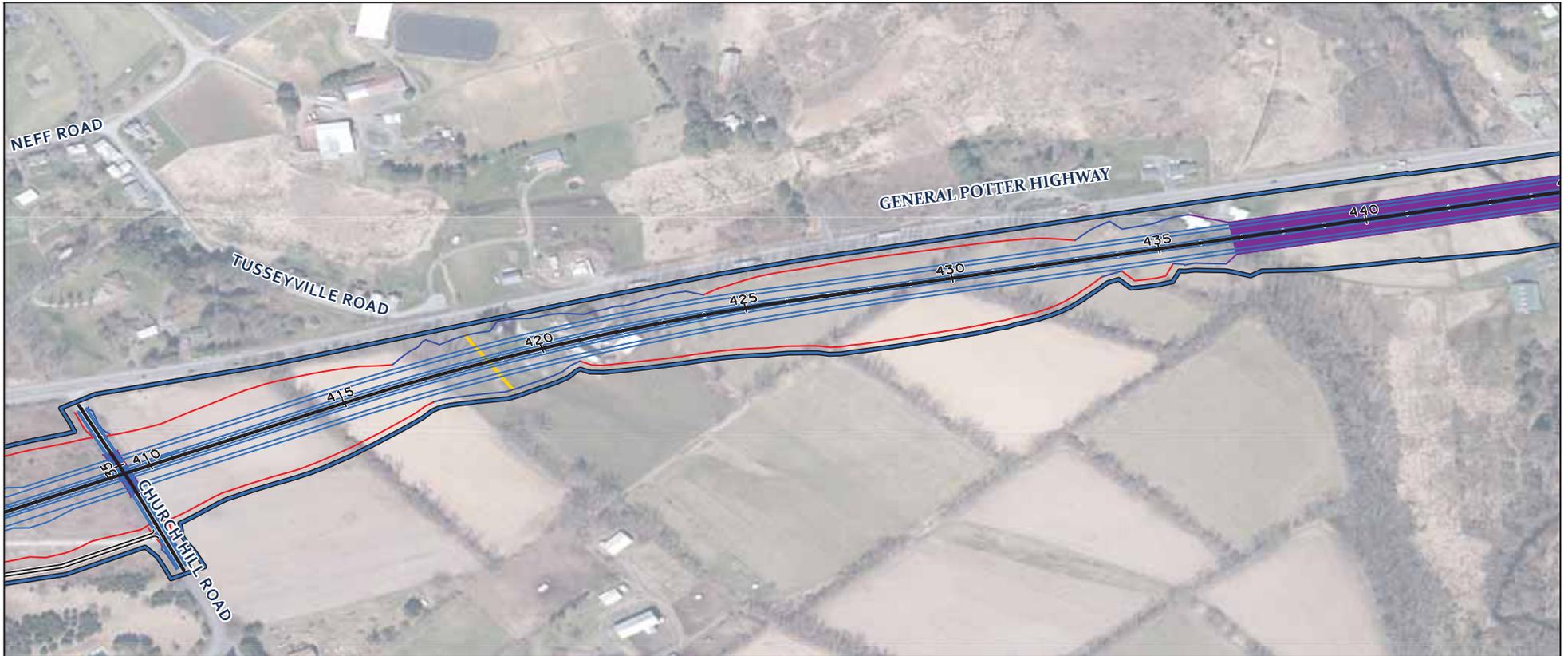


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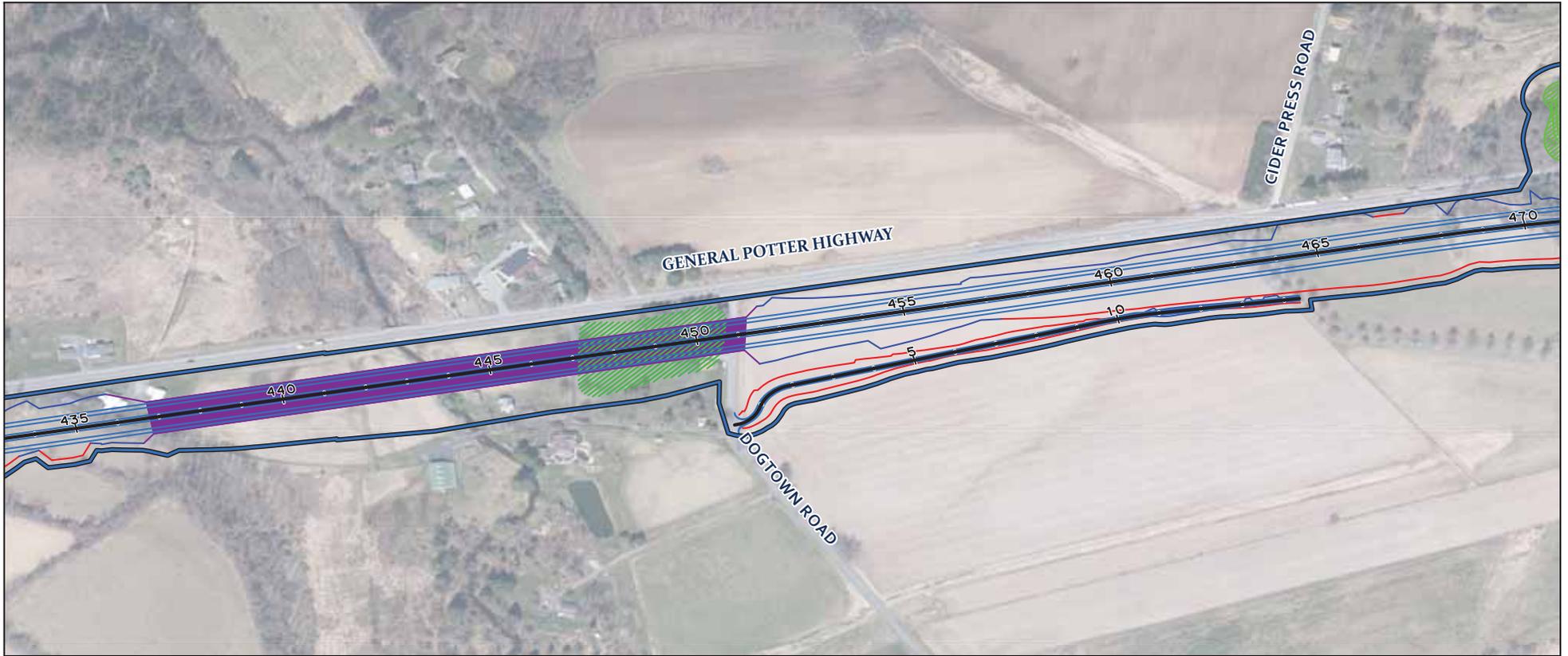


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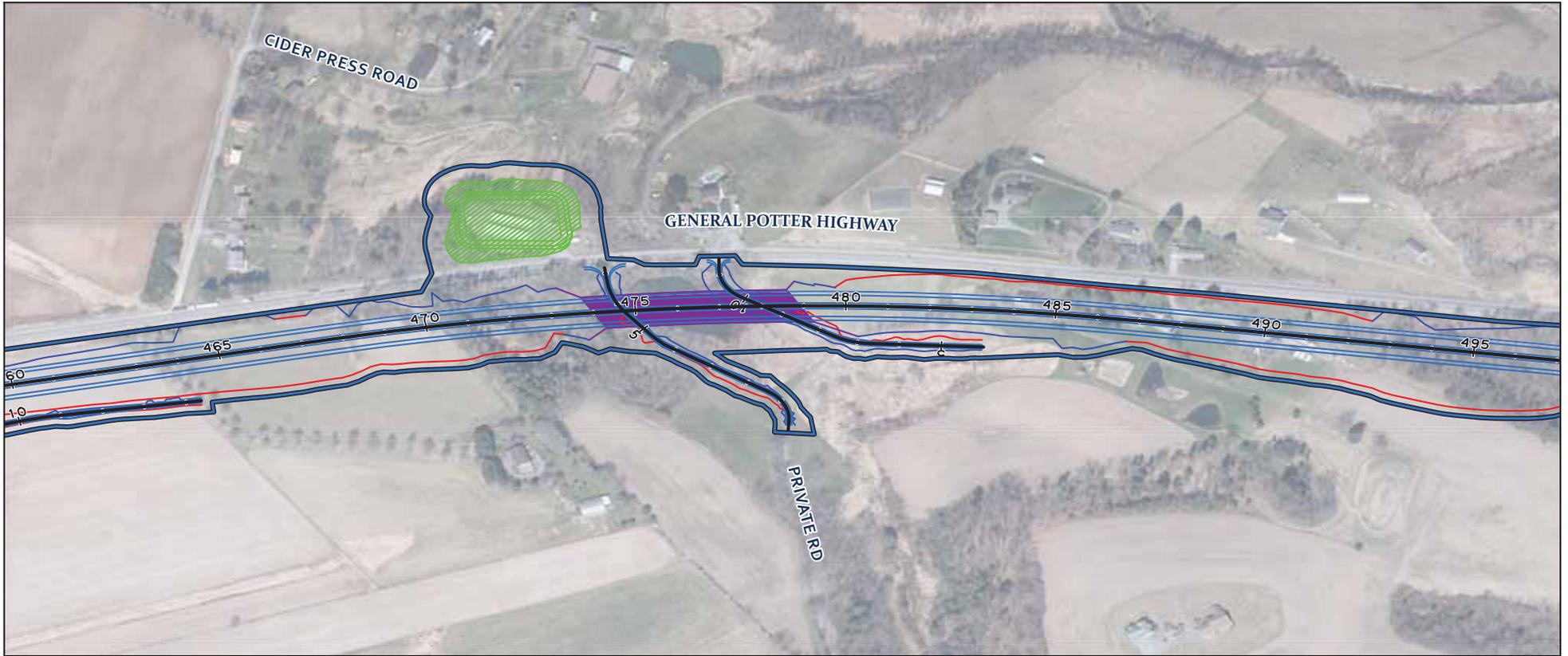


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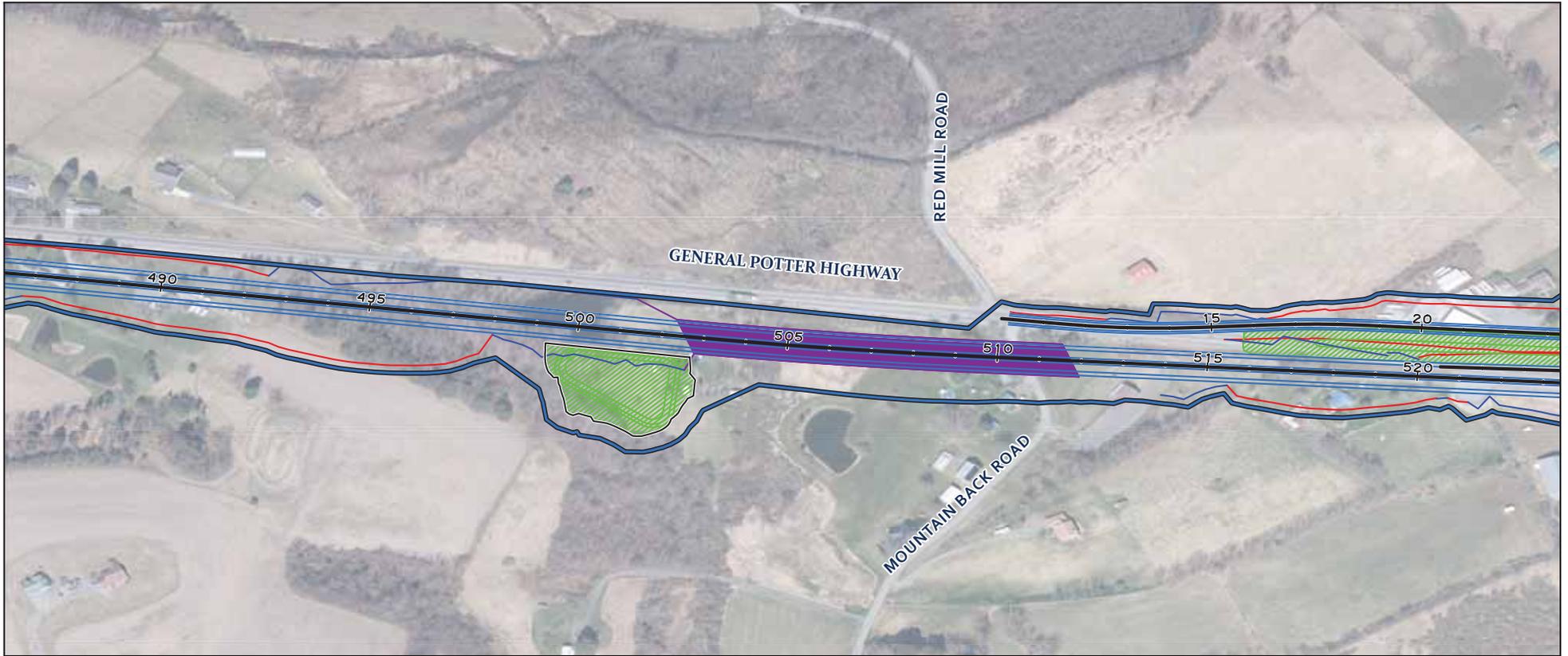


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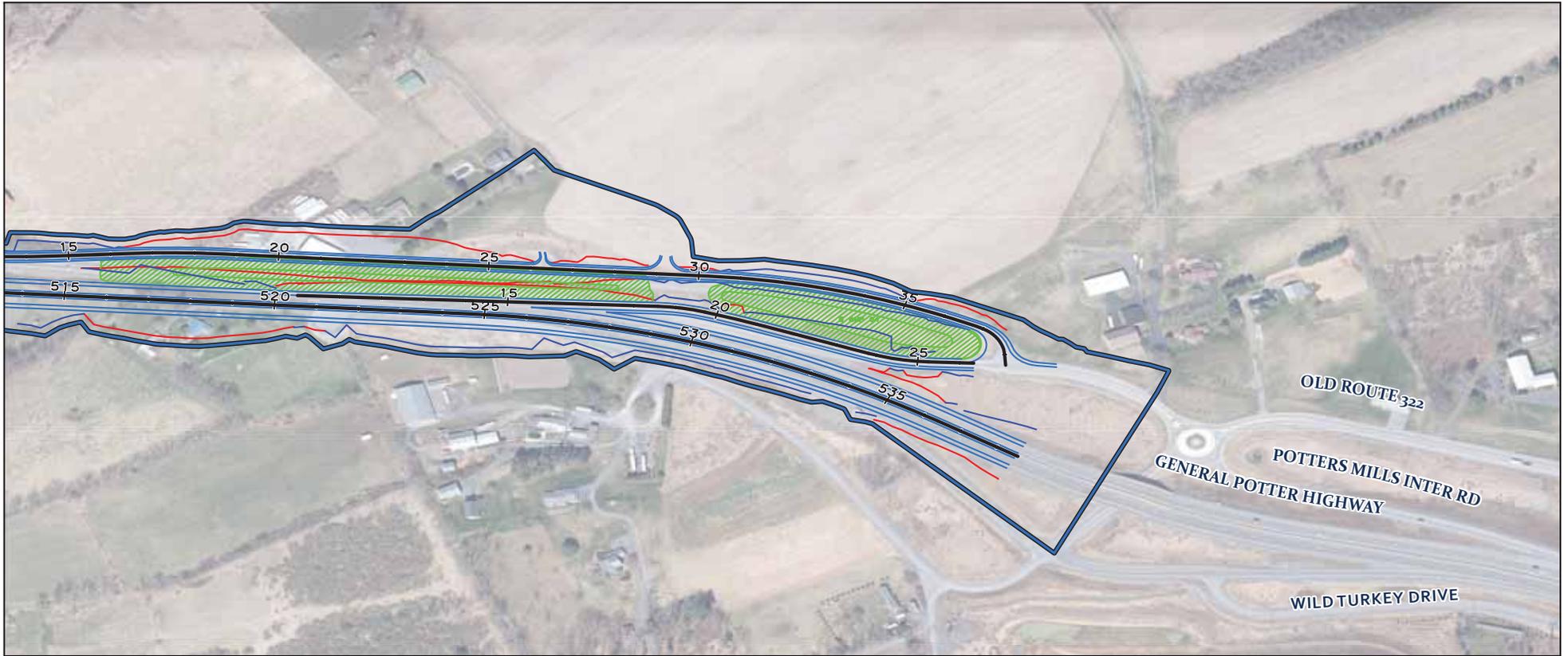
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0 0.05 0.1 Miles

South Alternative Evaluated in the EIS  
Figure 26





0 0.05 0.1 Miles

South Alternative Evaluated in the EIS  
Figure 26



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Appendix B – Alternative Cost Estimates

Roadway Cost			Total LF	Total Price LF
Mainline with Grass Median	750	16364	17,114	\$29,179,370
Mainline with Paved Median	9516	11396	20,912	\$40,464,720
Ramps	7416	1679	9,095	\$6,366,500
Two lane Arterials	9586	7600	17,186	\$12,030,200
Multi-lane Arterial (SR 45)	4494	0	4,494	\$3,145,800
Local Roads	1778	1181	2,959	\$1,479,500
Shared Use Path	6440	0	6,440	\$644,000
<b>Total Roadway Cost</b>				<b>\$93,310,090</b>
Earthwork Cost			Total CY	Total Price
Total Excavation (CUT)	172207	861310	1,033,517	\$15,502,755
Total Embankment (FILL)	1279458	695413	1,974,871	\$0
Foreign Borrow	1107251	-165897	941,354	\$18,827,080
<b>Total Earthwork Cost</b>				<b>\$34,329,835</b>
Square Foot Items			Total SQFT	Total Price
Bridge (Span Length 0-99')	3696	0	3,696	\$1,848,000
Bridge (Span Length 100' +)	118986	456186	575,172	\$201,310,200
Mitigation Structure Length	0	0	0	\$0
Linear Foot Items			Total LF	Total Price
Box Culverts	564	0	564	\$5,132,400
<b>Total Structure Cost</b>				<b>\$208,290,600</b>
<b>Subtotal 1</b>				<b>\$335,930,525</b>
Percentage/Cost Based Items				Total Price
E&S			3%	\$10,078,000
Mobilization			8%	\$26,874,000
MPT			5%	\$16,797,000
Env. Mitigation (Wet/Strm/For)			LS	\$3,557,200
<b>Total Percentage/Cost Based</b>				<b>\$57,306,200</b>
Gas Line Relocation			Total LF	Total Price
Gas Line Relocation	0	280	280	\$840,000
<b>Subtotal 2</b>				<b>\$394,076,725</b>
Right-of-Way Cost Est.			LS	\$58,398,000
Utility Impact Cost Est.			LS	\$2,000,000
Geotechnical Contingency			5%	\$19,704,000
Overall Contingency			20%	\$78,815,000
<b>Subtotal 3</b>				<b>\$552,993,725</b>
With 3% Annual Inflation to 2031				\$660,275,000
With 5% Annual Inflation to 2031				\$741,012,000
With 7% Annual Inflation to 2031				\$830,044,000
<b>TOTAL US 322 North</b>				<b>\$661 mil to \$831 mil</b>

Roadway Cost				Total LF	Total Price LF
Mainline with Grass Median	750	15854	16,604	\$28,309,820	
Mainline with Paved Median	9516	8539	18,055	\$34,936,425	
Ramps	7416	1679	9,095	\$6,366,500	
Two lane Arterials	9586	6411	15,997	\$11,197,900	
Multi-lane Arterial (SR 45)	4494	0	4,494	\$3,145,800	
Local Roads	1778	1993	3,771	\$1,885,500	
Shared Use Path	6440	0	6,440	\$644,000	
<b>Total Roadway Cost</b>				<b>\$86,485,945</b>	
Earthwork Cost			Total CY	Total Price	
Total Excavation (CUT)	172207	790129	962,336	\$14,435,040	
Total Embankment (FILL)	1279458	1404585	2,684,043	\$0	
Foreign Borrow	1107251	614456	1,721,707	\$34,434,140	
<b>Total Earthwork Cost</b>				<b>\$48,869,180</b>	
Square Foot Items			Total SQFT	Total Price	
Bridge (Span Length 0-99')	3696	0	3,696	\$1,848,000	
Bridge (Span Length 100' +)	118986	752359	871,345	\$304,970,750	
Mitigation Structure Length	0	0	0	\$0	
Linear Foot Items			Total LF	Total Price	
Box Culverts	564	300	864	\$7,862,400	
<b>Total Structure Cost</b>				<b>\$314,681,150</b>	
<b>Subtotal 1</b>				<b>\$450,036,275</b>	
Percentage/Cost Based Items				Total Price	
E&S			3%	\$13,501,000	
Mobilization			8%	\$36,003,000	
MPT			5%	\$22,502,000	
Env. Mitigation (Wet/Strm/For)			LS	\$5,086,400	
<b>Total Percentage/Cost Based</b>				<b>\$77,092,400</b>	
Gas Line Relocation			Total LF	Total Price	
Gas Line Relocation	0	400	400	\$1,200,000	
<b>Subtotal 2</b>				<b>\$528,328,675</b>	
Right-of-Way Cost Est.			LS	\$43,186,000	
Utility Impact Cost Est.			LS	\$2,000,000	
Geotechnical Contingency			5%	\$26,416,000	
Overall Contingency			20%	\$105,666,000	
<b>Subtotal 3</b>				<b>\$705,596,675</b>	
With 3% Annual Inflation to 2031				<b>\$842,482,000</b>	
With 5% Annual Inflation to 2031				<b>\$945,500,000</b>	
With 7% Annual Inflation to 2031				<b>\$1,059,101,000</b>	
<b>TOTAL US 322 Central</b>				<b>\$843 mil to \$1,060 mil</b>	

Roadway Cost		Total LF	Total Price LF
Mainline with Grass Median	14738	4380	\$32,596,190
Mainline with Paved Median	9900	8206	\$35,035,110
Ramps	7416	1679	\$6,366,500
Two lane Arterials	9996	2800	\$8,957,200
Multi-lane Arterial (SR 45)	4494	0	\$3,145,800
Local Roads	1068	421	\$744,500
Shared Use Path	6440	0	\$644,000
<b>Total Roadway Cost</b>			<b>\$87,489,300</b>
Earthwork Cost		Total CY	Total Price
Total Excavation (CUT)	1597910	705852	\$34,556,430
Total Embankment (FILL)	3225916	543253	\$0
Foreign Borrow	1628006	-162599	\$29,308,140
<b>Total Earthwork Cost</b>			<b>\$63,864,570</b>
Square Foot Items		Total SQFT	Total Price
Bridge (Span Length 0-99')	3696	0	\$1,848,000
Bridge (Span Length 100' +)	271762	288311	\$196,025,550
Mitigation Structure Length	0	0	\$0
Linear Foot Items		Total LF	Total Price
Box Culverts	564	300	\$7,862,400
<b>Total Structure Cost</b>			<b>\$205,735,950</b>
<b>Subtotal 1</b>			<b>\$357,089,820</b>
Percentage/Cost Based Items			Total Price
E&S		3%	\$10,713,000
Mobilization		8%	\$28,567,000
MPT		5%	\$17,854,000
Env. Mitigation (Wet/Strm/For)		LS	\$8,625,400
<b>Total Percentage/Cost Based</b>			<b>\$65,759,400</b>
Gas Line Relocation		Total LF	Total Price
Gas Line Relocation	510	0	\$1,530,000
<b>Subtotal 2</b>			<b>\$424,379,220</b>
Right-of-Way Cost Est.		LS	\$43,125,000
Utility Impact Cost Est.		LS	\$2,000,000
Geotechnical Contingency		15%	\$63,657,000
Overall Contingency		20%	\$84,876,000
<b>Subtotal 3</b>			<b>\$618,037,220</b>
With 3% Annual Inflation to 2031			\$737,936,000
With 5% Annual Inflation to 2031			\$828,170,000
With 7% Annual Inflation to 2031			\$927,674,000
<b>TOTAL US 322 South</b>			<b>\$738 mil to \$928 mil</b>