US 202 Section 200 Connectivity Analysis

April 2025

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PLANNING COMMISSION

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OVERVIEW

US Route 202 is a major US highway that runs between Delaware and Maine. The portion of US 202 in Pennsylvania is 59 miles long and traverses the four suburban counties in the Delaware Valley Regional Planning Commission (DVRPC) region: Chester, Delaware, Montgomery, and Bucks. US 202 Section 200, the portion of the highway between US 30 to the north and Matlack Street to the south, traverses West Whiteland, East Goshen, and West Goshen townships in Chester County.

The US 202 Section 200 corridor has experienced significant growth in recent years and will likely continue to grow into the future. Because of this recent and projected growth, traffic volumes on US 202 are likely to grow in the future, increasing congestion and safety concerns. West Chester Borough is located directly west of the study corridor and generates much of the local traffic in the area and to US 202. In addition, the corridor runs adjacent to many redeveloping business parks in the West Chester region, though they currently do not have direct access to the highway. This lack of direct access leads to increased congestion and pavement degradation to the local roads required to access the highway.

OBJECTIVES

The two objectives of this study are to identify ways to **better connect US 202 with the surrounding land uses between the interchange with Boot Road to the north and the interchange with US 322 to the south** and to **assess the local impact of the US 202 and US 322 interchange completion concept**. This study primarily focuses on the portion of US 202 Section 200 between Boot Road to the north and US 322 to the south. Interchanges in the study area include Boot Road, PA 100, and US 322. The intersection between US 322 and Phoenixville Pike is also included in the study area. The study area is shown in **Figure 1** on page 4.

EXISTING CONDITIONS

In the study area, business parks with commercial and industrial land uses immediately surround US 202 to its east and west, while residential land uses are most prevalent further east and west and immediately north of US 202. In recent years, 31 developments containing 2,905 residential units and 2,854,694 non-residential square feet have been built or proposed within two miles of the study area. The land use surrounding the study area is shown in **Figure 2** on page 8, while new and proposed developments within two miles of the study area are listed in **Table 1** on page 9 and shown in **Figure 3** on page 10.

The three existing interchanges along US 202 in the study area include a full interchange at **Boot Road** and partial interchanges at **PA 100** and **US 322**. In addition, the study area includes the intersection at **US 322 and Phoenixville Pike**. The study area has an AM peak hour of 7:30 AM to 8:30 AM and a PM peak hour of 4:30 PM to 5:30 PM. Generally, NB US 202 traffic volumes are higher during the AM peak hour than during the PM peak hour, while SB US 202 traffic volumes are higher during the PM peak hour than during the AM peak hour. The peak hour traffic volumes in the study area are shown in **Figure 4** on page 13 for the AM peak hour and **Figure 5** on page 13 for the PM peak hour.

POTENTIAL CONNECTIONS AND BUILD ALTERNATIVES

This report highlights potential connections and the three Build alternatives for the year 2050. These potential connections include completing the US 202 and US 322 interchange and connecting US 202 to 5 Points Road, PA 100, and McDermott Drive. DVRPC worked with the Chester County Planning Commission to develop three Build alternatives for the year 2050.

- **2050 Build Alternative 1** completes the US 202 and US 322 interchange. Build Alternative 1 is shown in **Figure 7** on page 18.
- **2050 Build Alternative 2** connects SB US 202 and WB US 322, NB US 202 and 5 Points Road, NB PA 100 and 5 Points Road, and EB US 322 and 5 Points Road. Build Alternative 2 is shown in **Figure 8** on page 19.
- **2050 Build Alternative 3** connects SB US 202 and WB US 322, SB US 202 and NB PA 100, NB US 202 and 5 Points Road, US 202 and McDermott Drive, PA 100 and 5 Points Road, and EB US 322 and 5 Points Road. Build Alternative 3 is shown in **Figure 9** on page 20.

TRAFFIC ANALYSIS

The report summarizes findings from traffic microsimulation modeling to evaluate the existing conditions of the US 202 corridor as well as the No Build Alternative and three Build alternatives for the year 2050. The project team used PTV Vissim traffic simulation software to analyze traffic operations for both the AM and PM peak hours and quantify three highway performance measures: **delay**, **level of service (LOS)**, and **queue length**. The project team prepared an Existing (Year 2023) microsimulation model, a No Build (Year 2050) model, and models for the three Build (Year 2050) alternatives for both peak hours. The results and analyses of these models are shown beginning on page 21.

KEY FINDINGS

Finally, the report presents the project team's findings and discusses recommendations and next steps, which include potential funding sources. As part of the traffic microsimulation modeling portion of this study, the project team modeled traffic volumes at twelve existing and proposed road segments throughout the study area for the No Build Alternative and three Build alternatives. These volumes are listed in **Table 13** on page 54 for the AM peak hour and **Table 14** on page 55 for the PM peak hour.

The three major intersections in the study area that are present in the No Build Alternative and all three Build alternatives are NB US 202 and Boot Road, SB US 202 and Boot Road, and Phoenixville Pike and US 322. The delay and LOS of these intersections are listed in **Table 15** on page 57 for the AM peak hour and **Table 16** on page 58 for the PM peak hour. During the AM peak hour, the No Build Alternative and Build Alternative 1 generally had fewer approaches and intersections operating at LOS E or worse than Build Alternatives 2 and 3. During the PM peak hour, the No Build Alternative generally had fewer approaches and intersections operating at LOS E or worse than Build Alternatives 1, 2, and 3.

CONCLUSION

The study underscores the importance of US 202 as a major transportation route and highlights the need for improved connections to handle future growth. While all Build alternatives offer enhanced connectivity, they also introduce potential delays and increased costs. Further design and cost evaluations are needed to determine the most effective and feasible solution.

This report serves as a foundation for future planning and decision-making, emphasizing the need for strategic improvements to accommodate growth and improve connectivity along the US 202 corridor.

CHAPTER 1:

Introduction

PURPOSE AND NEED

US Route 202 is a major US highway that runs between Delaware and Maine. The portion of US 202 in Pennsylvania is 59 miles long and traverses the four suburban counties in the Delaware Valley Regional Planning Commission (DVRPC) region: Chester, Delaware, Montgomery, and Bucks. US 202 Section 200, the portion of the highway between US 30 to the north and Matlack Street to the south, traverses West Whiteland, East Goshen, and West Goshen townships in Chester County. This portion of US 202 connects Delaware with the US 30 corridor and transports local traffic in the West Chester region, adjacent to the west of the study area.

The US 202 Section 200 corridor has experienced significant growth in recent years, and this growth will likely continue into the future. Between 2015 and 2050, the population and employment in Chester County is projected to increase by about 28 percent. In addition, the population and employment are projected to increase by about 49 percent and 22 percent respectively in West Whiteland Township, by about 7 percent and 12 percent respectively in East Goshen Township, and by about 15 percent and 17 percent respectively in West Goshen Township during this time. Because of the corridor's significant recent and projected growth, the traffic volumes on US 202 are likely to grow in the future, increasing congestion and safety concerns.

US 202 Section 200 runs adjacent to many business parks in the West Chester region, though they currently do not have direct access to the highway. This lack of direct access leads to increased congestion and road damage to the local roads required to access the highway. These business parks have experienced redevelopment in recent years, and improving direct access between the employment centers and the highway might relieve congestion on local roads, spur redevelopment and densification of the business parks, improve travel times, improve the ability of the businesses to attract new employees and tenants, and reduce air pollution. DVRPC worked with municipal officials from West Goshen Township, the Chester County Planning Commission (CCPC), and PennDOT District 6-0 to identify connections between the portion of US 202 Section 200 between Boot Road to the north and US 322 to the south and the surrounding land uses and assess the impact of completing the US 202 and US 322 interchange.

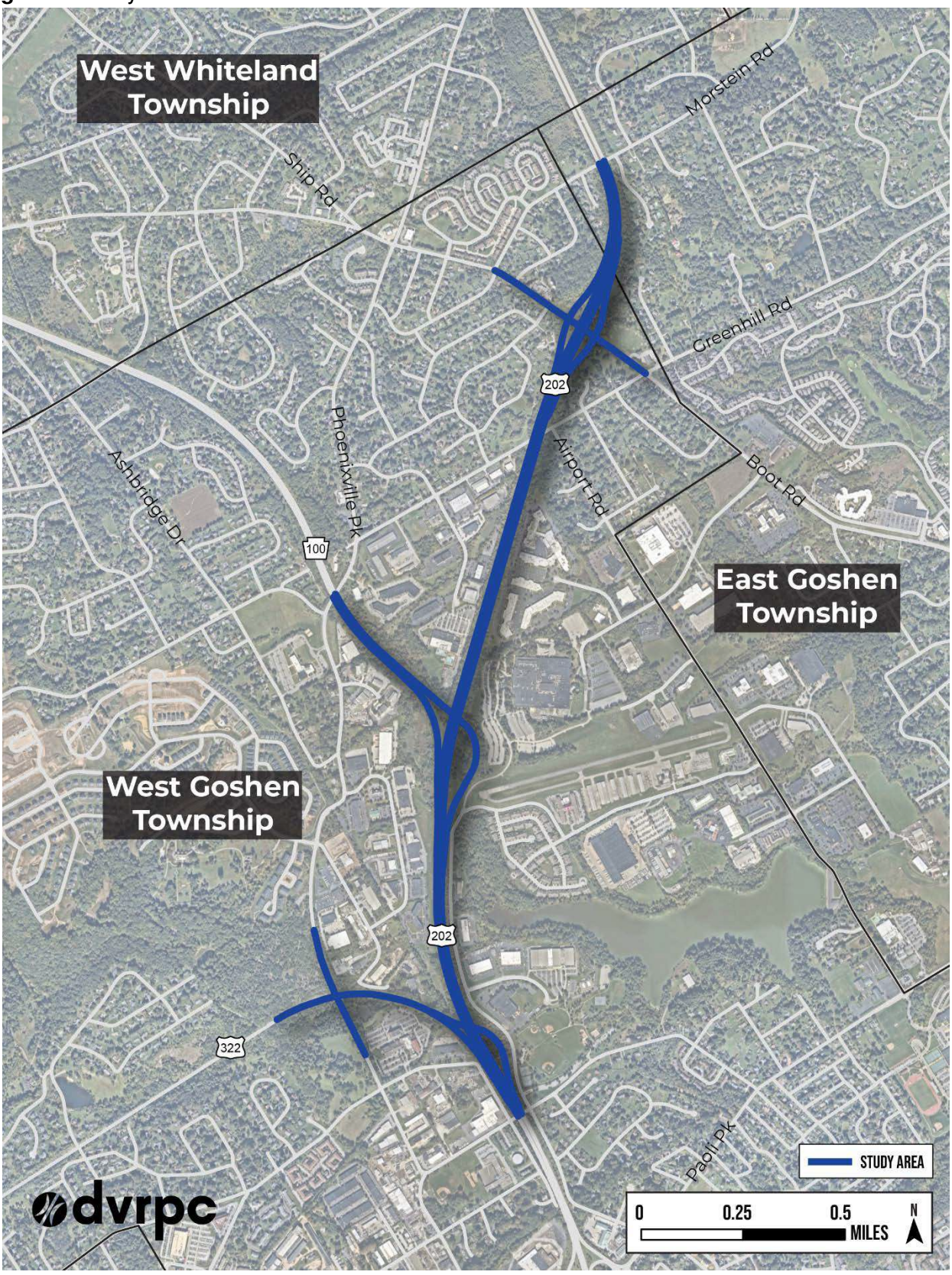
OBJECTIVES

This study sought to identify ways to **better connect US 202 with the surrounding land uses between the interchange with Boot Road to the north and the interchange with US 322 to the south**. This study develops conceptual alignments to directly connect the corridor with the adjacent businesses and employment centers. The second objective of this study is to **assess the local impact of the US 202 and US 322 interchange completion concept**. This study revisits the concept of completing the partial interchange between US 202 and US 322.

STUDY AREA

This study primarily focuses on the portion of US 202 Section 200 between Boot Road to the north and US 322 to the south. Interchanges in the study area include Boot Road, PA 100, and US 322. The intersection between US 322 and Phoenixville Pike is also included in the study area. The study area is shown in **Figure 1** on page 4.

Figure 1. Study Area



Sources: DVRPC 2022, Chester County GIS 2020. Aerial Imagery: Nearmap 2022.

PLANNING PROCESS

The planning process of this year-long study is summarized below.

- DVRPC collected data on existing conditions in the study area. This data included land use, recent development, traffic volumes, and turning movement counts during the AM and PM peak hours.
- DVRPC used traffic microsimulation models to evaluate existing conditions and the 2050 No Build Alternative on US 202 Section 200 between Boot Road and US 322. The intersection of US 322 and Phoenixville Pike was also included in this evaluation.
- DVRPC developed three 2050 Build alternatives and used traffic microsimulation models to evaluate traffic impact. These alternatives are shown on pages 18, 19, and 20.
    - 2050 Build Alternative 1 completes the US 202 and US 322 interchange.
    - 2050 Build Alternative 2 connects southbound (SB) US 202 and westbound (WB) US 322, northbound (NB) US 202 and 5 Points Road, NB PA 100 and 5 Points Road, and eastbound (EB) US 322 and 5 Points Road.
    - 2050 Build Alternative 3 connects SB US 202 and WB US 322, SB US 202 and NB PA 100, NB US 202 and 5 Points Road, US 202 and McDermott Drive, PA 100 and 5 Points Road, and EB US 322 and 5 Points Road.

PREVIOUS STUDIES

US 322/202 INTERSECTION COMPLETION STUDY

The US 322/202 Intersection Completion Study was completed by DVRPC in 2008. The study analyzes the potential impacts of constructing the two missing ramps to complete the US 202 and US 322 interchange, a concept proposed by the West Chester Planning Commission in 2005. In the study, DVRPC evaluated a no-build scenario and two build scenarios, which both include completing the US 202 and US 322 interchange as well as constructing a ramp from NB Pottstown Pike (PA 100) to EB US 322. From the proposed ramp, the first build scenario has slip ramps to the Brandywine Industrial Park, while the second build scenario goes to NB PA 100 without slip ramps to the industrial park. To evaluate these scenarios, DVRPC used existing traffic data, 2030 population and employment forecasts, and the DVRPC travel model to project traffic volumes for each alternative in 2030. In addition, DVRPC evaluated the impacts of these scenarios on surrounding land use and development. The study concluded that traffic volumes on completed US 202 and US 322 ramps would be similar to traffic volumes on nearby US 202 interchange ramps, and completing the interchange would reduce traffic volumes on roadways in the area and adjacent US 202 interchanges at Lancaster Avenue (US 30) and Boot Road. The study also concluded that the area surrounding the US 202 and US 322 interchange will continue to develop whether or not the interchange is completed.

US 202 SECTION 200 TRANSPORTATION OPERATIONS AUDIT

The US 202 Section 200 Transportation Operations Audit was completed by DVRPC and CCPC in 2011. The goals of the audit were to identify multimodal issues impacting mobility on the corridor and coordinated approaches to transportation operations and incident management, develop low-cost mitigation strategies that preserve capacity, and improve the safety and reliability of the corridor. The audit process included collecting background information about the study area, performing a crash analysis of the corridor, meeting with the audit team to identify locations to study for the audit, conducting the audit, and meeting with the audit team to present conclusions of the audit. The audit team was made up of representatives from DVRPC, CCPC, Chester County Department of Emergency Services, Federal Highway Administration (FHWA), PennDOT, Southeastern Pennsylvania Transportation Authority (SEPTA), Transportation Management Association of Chester County (TMACC), East Goshen Township, West Goshen Township, West Whiteland Township, West Goshen Police Department, and Westtown-East Goshen Regional Police Department. Auditors identified the following issues: a lack of guidance because of inadequate delineation and lane designation, inadequate or missing signage, overgrown vegetation, and conflicting movements in merge areas because of limited

through lanes and short entrance and exit lanes. The report recommended updating signage, removing overgrown vegetation, and installing dashed lines to separate through lanes from auxiliary lanes to address these issues.

US 202 SECTION 100 OPERATIONS ANALYSIS

In 2019, DVRPC completed the US 202 Section 100 Operations Analysis to improve the operation efficiency of US 202 Section 100 through West Goshen Township and Westtown Township. This study was part of a three-year planning process that also included the US 202 Section 200 Operations Analysis, which was completed after this study. DVRPC worked with CCPC to collect crash data and travel times and speeds on the US 202 corridor before using traffic microsimulation models to evaluate the existing conditions in 2018 and the 2045 no-build alternative for US 202 Section 100. Then, DVRPC developed three build scenarios for 2045, which contained different versions of numerous alternatives. These alternatives included improving the US 202 and Matlack Street intersection and improving the NB and SB ramps at the US 202 and High Street (US 322 Business) intersection. The study found that all three build scenarios may improve traffic flow, and that the first build scenario, which added a lane to the inside of the NB US 202 ramp and controlled traffic merging from High Street with a stop sign, is the most cost-effective scenario. The study identified funding sources that could implement one of the proposed scenarios as well as numerous safety recommendations.

US 202 SECTION 200 OPERATIONS ANALYSIS

The US 202 Section 200 Operations Analysis was completed by DVRPC in 2020. The objective of the study was to improve the operation efficiency of US 202 Section 200 through West Goshen Township. This study was part of a three-year planning process that also included the aforementioned US 202 Section 100 Operations Analysis, which was completed before this study. In addition to working with CCPC to collect crash data and travel times and speeds mentioned in the US 202 Section 100 Operations Analysis summary, DVRPC used traffic microsimulation models to evaluate the existing conditions in 2019 and the 2045 no-build scenarios for US 202 Section 200. Then, DVRPC evaluated three build scenarios for NB US 202 and one build scenario for SB US 202, which both adjusted the dimensions of the roadway and the configuration of the acceleration and deceleration lanes. The study found that the no-build scenario is the preferred scenario for SB US 202, while the second alternative of the second build scenario, which expanded NB US 202 to three lanes with a collector-distributer lane, was the preferred scenario for NB US 202. The study finally identified funding sources that could implement one of the proposed scenarios as well as numerous safety recommendations.

DOCUMENT OVERVIEW

This report first provides an overview of existing traffic conditions and connections as well as land use and new development in the vicinity of US 202 between Boot Road to the north and US 322 to the south. Next, the report highlights potential connections and the three Build alternatives for the year 2050. The report then uses traffic microsimulation modeling to evaluate the existing conditions of the US 202 corridor as well as the No Build Alternative and three Build alternatives for the year 2050. Finally, the report presents the project team's findings and discusses recommendations and next steps, which include potential funding sources.

CHAPTER 2:

Existing Conditions

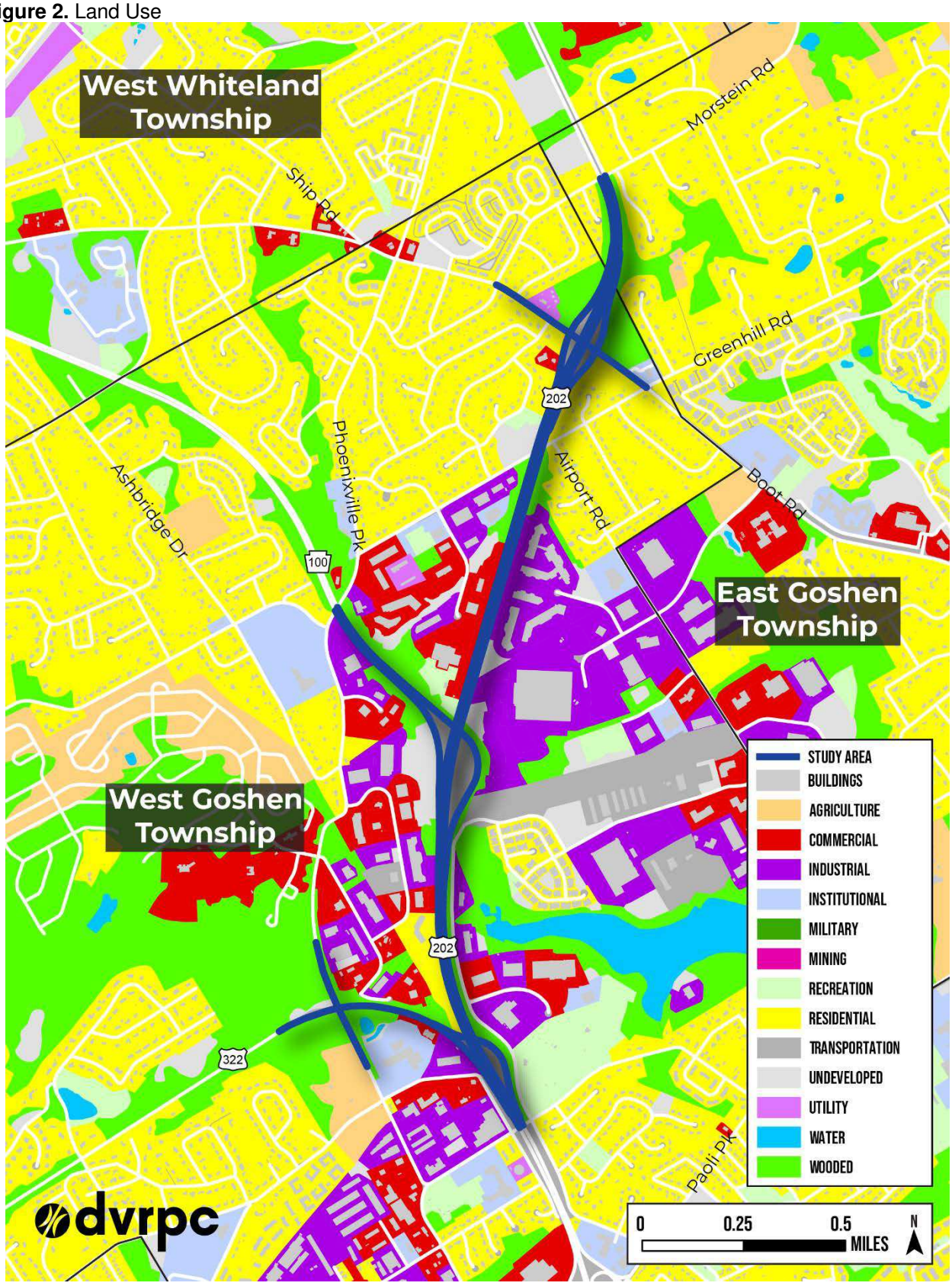
LAND USE

US 202 between Boot Road and US 322 has many business parks located to its immediate east and west. These business parks primarily contain commercial and industrial land uses. Meanwhile, residential land uses are most prevalent further east and west and immediately north of the study area. The Brandywine Regional Airport is located just east of where PA 100 branches off from US 202. The land use surrounding the study area is shown in **Figure 2**.

NEW AND PROPOSED DEVELOPMENT

In recent years, 31 developments have been built or proposed within two miles of the study area. These developments contain 2,905 residential units and 2,854,694 non-residential square feet. New and proposed developments within two miles of the study area are listed in **Table 1** and shown in **Figure 3.**

Figure 2. Land Use



Sources: DVRPC 2015, DVRPC 2020, Chester County GIS 2017, Chester County GIS 2020.

Table 1. New and Proposed Development within Two Miles of Study Area

Key	Name	Municipality	Residential Units	Non-Residential Area (square feet)
1	Ship Run	West Whiteland	164	
2	Lochiel Farm	West Whiteland	140	
3	Exton Knoll	West Whiteland	319	
4	Church Farm School	West Whiteland	18	128,885
5	The Cockerham Tract	East Whiteland	51	
6	The Townes at Malvern (Section 2)	East Whiteland	64	
7	Frazer Lanes Redevelopment	East Whiteland	227	
8	Self-Storage Facility, 1464 Pottstown Pike	West Whiteland		88,000
9	Glen Loch II Subdivision	West Whiteland	108	
10	Immaculata University	East Whiteland	30	64,329
11	Traditions of West Goshen	West Goshen	114	
12	Greystone Elementary School	West Goshen		76,542
13	Woodlands at Greystone	West Goshen	589	
14	West Goshen Business Park Lot 8	West Goshen	114	
15	Arbours Square at West Goshen	West Goshen	150	
16	Penn Medicine Chester County Hospital Expansion	West Goshen-West Chester		250,905
17	Lands of Schramm	West Goshen		51,200
18	Holly Hills	East Goshen	64	
19	Sharpless Hall Redevelopment	West Chester	69	
20	115-117 East Chestnut Street	West Chester	60	
21	220 East Chestnut Street Apartments	West Chester	208	
22	Melton Center Apartments	West Chester	51	
23	West Chester Hotel	West Chester		88,389
24	Market Place	West Chester	89	
25	Redevelopment for Multi-Family Apartment Complex (250 East Market Street)	West Chester	219	
26	Drury Development	West Chester	57	
27	East Nields Industrial Center	West Chester		523,653
28	West Chester University Expansion	West Chester		1,034,164
29	West Goshen Hotel	West Goshen		213,000
30	300 Snyder Avenue Self-Storage Facility	West Goshen		105,000
31	Goshen Leisure Development	West Goshen		230,627
		Total	**2,905**	**2,854,694**

Source: Chester County Planning Commission 2022.

Figure 3. New and Proposed Developments within Two Miles of Study Area

Sources: DVRPC 2020, Chester County GIS 2020, Chester County GIS 2022.

EXISTING CONNECTIONS

There are three existing interchanges along US 202 within the study area:

- **Boot Road**, the northernmost interchange in the study area, is a full diamond interchange with signal-controlled intersections at the NB and SB US 202 on-and-off-ramps.
- **PA 100**, the central interchange in the study area, is a partial interchange with ramps from NB US 202 to NB PA 100 and from SB PA 100 to SB US 202.
- **US 322**, the southernmost interchange in the study area, is a partial interchange with ramps from NB US 202 to WB US 322 and from EB US 322 to SB US 202.

In addition to the three US 202 interchanges, the study area includes a signal-controlled intersection at **US 322 and Phoenixville Pike**.

TRAFFIC VOLUMES

DVRPC conducted manual turning movement counts (MTMCs) and Automatic Traffic Recorder (ATR) counts at six locations in the study area in October 2022:

- US 202 north of Boot Road
- NB US 202 at Boot Road
- SB US 202 at Boot Road
- US 202 at PA 100
- US 202 south of US 322
- US 322 and Phoenixville Pike

The study area has an AM peak hour of 7:30 AM to 8:30 AM and a PM peak hour of 4:30 PM to 5:30 PM. Generally, NB US 202 traffic volumes are higher during the AM peak hour than during the PM peak hour, while SB US 202 traffic volumes are higher during the PM peak hour than during the AM peak hour.

AM PEAK HOUR VOLUMES

During the AM peak hour, NB US 202 has higher traffic volumes than SB US 202 north of PA 100, while SB US 202 has higher traffic volumes than NB US 202 south of PA 100. NB traffic volumes on US 202 decrease significantly at US 322 and PA 100 but increase slightly at Boot Road. SB traffic volumes on US 202 decrease slightly at Boot Road but increase significantly at PA 100 and US 322. The turning movements onto or off of US 202 with the highest traffic volumes are:

- The right from SB PA 100 to SB US 202 (1,740 vehicles),
- The right from NB US 202 to NB PA 100 (1,194 vehicles),
- The left from the SB US 202 off-ramp to EB Boot Road (623 vehicles),
- The right from WB Boot Road to the NB US 202 on-ramp (518 vehicles), and
- The right from NB US 202 to WB US 322 (486 vehicles).

The AM peak hour traffic volumes in the study area are shown in **Figure 4** on page 13.

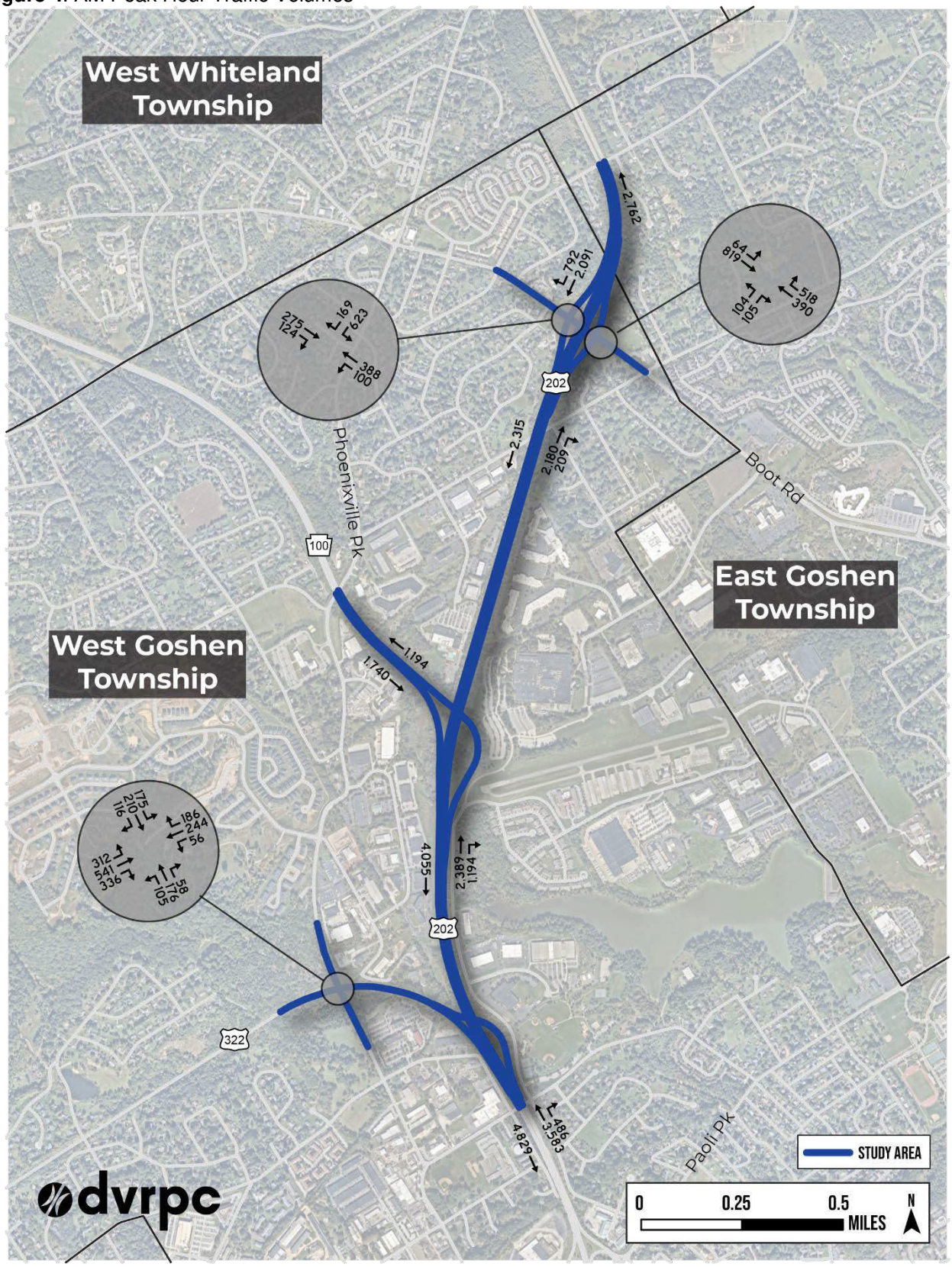
PM PEAK HOUR VOLUMES

During the PM peak hour, SB US 202 has higher traffic volumes than NB US 202 throughout the entire study area. NB traffic volumes on US 202 decrease significantly at US 322 and PA 100 but increase slightly at Boot Road. SB traffic volumes on US 202 decrease slightly at Boot Road but increase significantly at PA 100 and US 322. The turning movements on to or off of US 202 with the highest traffic volumes are:

- The right from SB PA 100 to SB US 202 (1,412 vehicles),
- The right from NB US 202 to NB PA 100 (1,234 vehicles),
- The right from NB US 202 to WB US 322 (785 vehicles),
- The right from WB Boot Road to the NB US 202 on-ramp (669 vehicles), and
- The left from the SB US 202 off-ramp to EB Boot Road (354 vehicles).

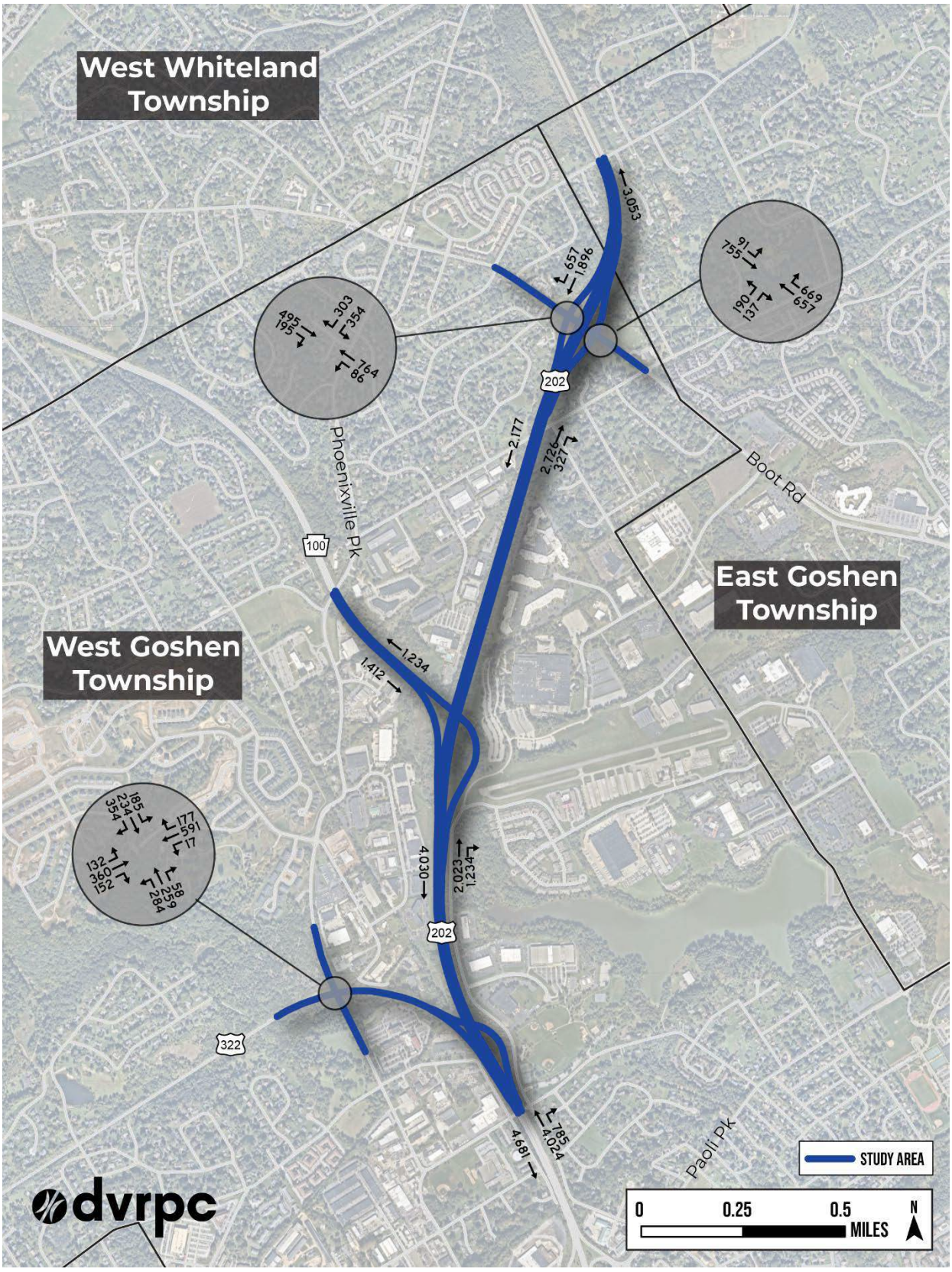
The PM peak hour traffic volumes in the study area are shown in **Figure 5** on page 13.

Figure 4. AM Peak Hour Traffic Volumes



Source: DVRPC 2022. Aerial Imagery: Nearmap 2022.

Figure 5. PM Peak Hour Traffic Volumes



Source: DVRPC 2022. Aerial Imagery: Nearmap 2022.

CHAPTER 3:

Potential Connections and Build Alternatives

POTENTIAL CONNECTIONS

COMPLETION OF US 202 AND US 322 INTERCHANGE

US 322, a US highway that travels between Atlantic City, New Jersey, to the east and Cleveland, Ohio, to the west, immediately connects the West Chester area to Chester to the east and Downingtown to the west. Currently, the US 202 and US 322 interchange only has ramps from NB US 202 to WB US 322 and from EB US 322 to SB US 202. The potential completion of this interchange, first proposed by the West Chester Planning Commission in 2005 and then studied by DVRPC in 2008, includes constructing ramps from SB US 202 to EB US 322 and from WB US 322 to NB US 202 to join the existing ramps.

CONNECTION TO 5 POINTS ROAD

A local road traveling adjacent to NB US 202, 5 Points Road provides access to the business park, which includes the QVC headquarters, and the Brandywine Regional Airport immediately east of the study area. Because there is no existing connection between US 202 and 5 Points Road, vehicles must exit US 202 at Boot Road or Paoli Pike and then travel on other local roads to access 5 Points Road ,the business park, and airport. Potential connections between US 202, 5 Points Road, and other roads include:

- A ramp from NB US 202 to 5 Points Road,
- A ramp from 5 Points Road to NB US 202,
- A ramp from 5 Points Road to SB US 202,
- A ramp from 5 Points Road to NB PA 100,
- A ramp from SB PA 100 to 5 Points Road, and
- A ramp from EB US 322 to 5 Points Road.

CONNECTION TO PA 100

PA 100, a state route that travels between US 202 near West Chester and Lehigh County to the north, connects the West Chester area with Exton, Lionville, Pottstown, and other places to the north. Currently, the US 202 and PA 100 interchange only has ramps from NB US 202 to NB PA 100 and from SB PA 100 to SB US 202. Potential connections between US 202, PA 100, and other roads include:

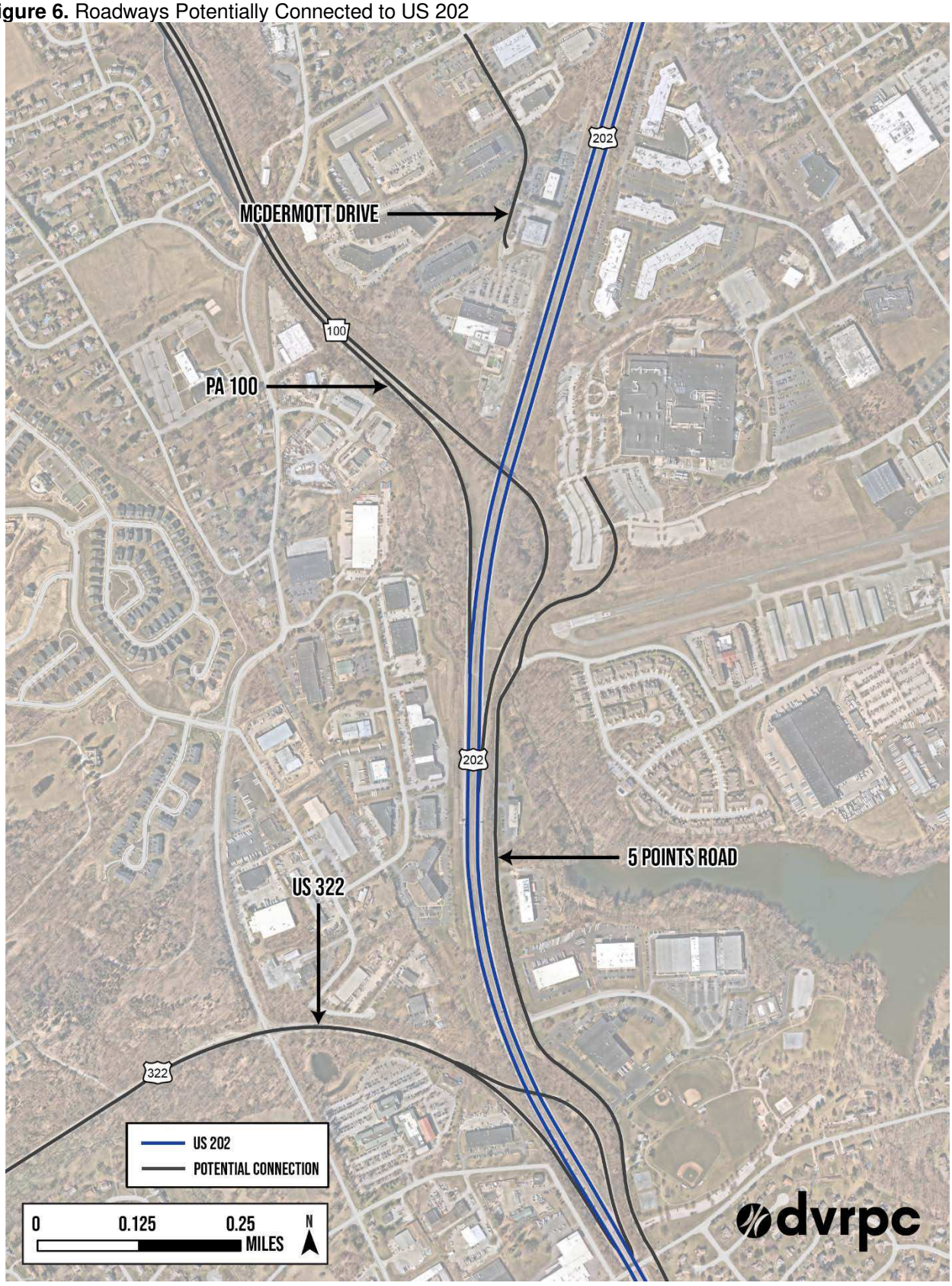
- A ramp from SB US 202 to NB PA 100,
- A ramp from 5 Points Road to NB PA 100, and
- A ramp from SB PA 100 to 5 Points Road.

CONNECTION TO MCDERMOTT DRIVE

McDermott Drive is a local road that travels within the business park immediately north of the US 202 and PA 100 interchange. Because there is no existing connection between US 202 and 5 Points Road, vehicles must exit US 202 at Boot Road or Paoli Pike and then travel on other local roads to access McDermott Drive and the business park. Potential connections between US 202, McDermott Drive, and other roads include:

- An extension of McDermott Drive over US 202 via a two-way bridge,
- A ramp from the bridge to NB US 202,
- A ramp from SB US 202 to the bridge,
- A ramp from the bridge to SB US 202, and
- An extension of 5 Points Road from Wilson Drive to the McDermott Drive bridge.

Figure 6. Roadways Potentially Connected to US 202



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

BUILD ALTERNATIVES

DVRPC worked with the Chester County Planning Commission to develop three Build alternatives for the year 2050. These alternatives contain roadway improvements to interchanges and intersections on or near US 202 in the study area, with the primary focus being on the US 202 and US 322 interchange and the US 202 and PA 100 interchange.

2050 BUILD ALTERNATIVE 1

2050 Build Alternative 1 completes the US 202 and US 322 interchange. This alternative adds ramps from SB US 202 to WB US 322 and from EB US 322 to NB US 202. Build Alternative 1 is shown in **Figure 7** on page 18.

2050 BUILD ALTERNATIVE 2

2050 Build Alternative 2 connects SB US 202 and WB US 322, NB US 202 and 5 Points Road, NB PA 100 and 5 Points Road, and EB US 322 and 5 Points Road. This alternative adds a roundabout at the 5 Points Road and Wilson Drive intersection. This alternative also adds the following ramps:

- From SB US 202 to WB US 322
- From EB US 322 to 5 Points Road
- From NB US 202 at PA 100 to the 5 Points Road and Wilson Drive roundabout
- From the 5 Points Road and Wilson Drive roundabout to NB US 202 north of PA 100
- From the 5 Points Road and Wilson Drive roundabout to NB PA 100 at US 202

Build Alternative 2 is shown in **Figure 8** on page 19.

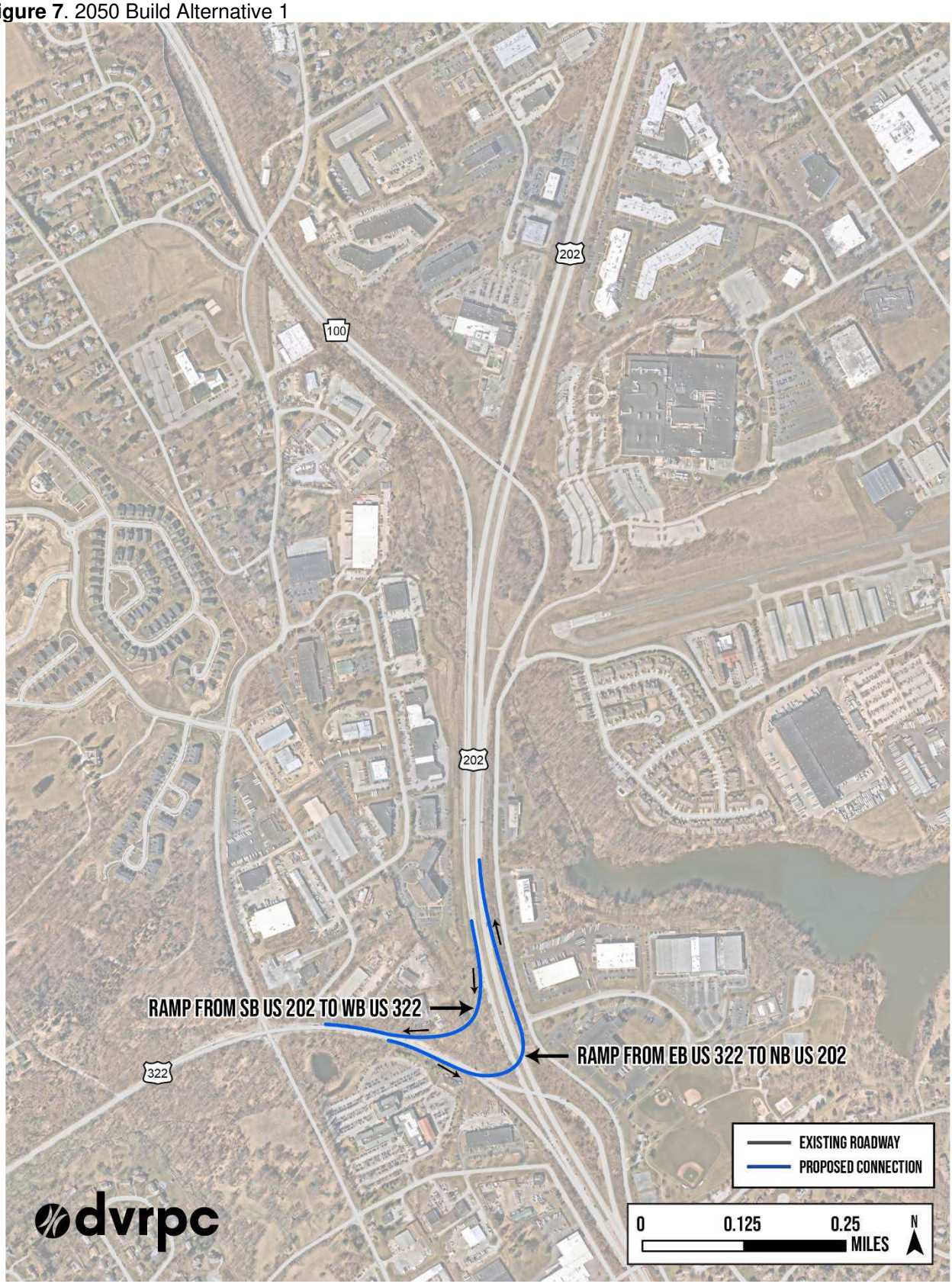
2050 BUILD ALTERNATIVE 3

2050 Build Alternative 3 connects SB US 202 and WB US 322, SB US 202 and NB PA 100, NB US 202 and 5 Points Road, US 202 and McDermott Drive, PA 100 and 5 Points Road, and EB US 322 and 5 Points Road. This alternative adds a roundabout at the 5 Points Road and Wilson Drive intersection. This alternative also adds a two-way bridge that carries an extension of McDermott Drive over US 202. In addition, this alternative extends 5 Points Road from Wilson Drive to the McDermott Drive bridge. Finally, this alternative adds the following ramps:

- From SB US 202 to WB US 322
- From EB US 322 to 5 Points Road
- From NB US 202 at PA 100 to the 5 Points Road and Wilson Drive roundabout
- From the 5 Points Road and Wilson Drive roundabout to NB PA 100 at US 202
- From SB PA 100 to the 5 Points Road and Wilson Drive roundabout,
- From SB US 202 to NB PA 100
- From the McDermott Drive bridge to NB US 202
- From SB US 202 to the McDermott Drive bridge
- From the McDermott Drive bridge to SB US 202

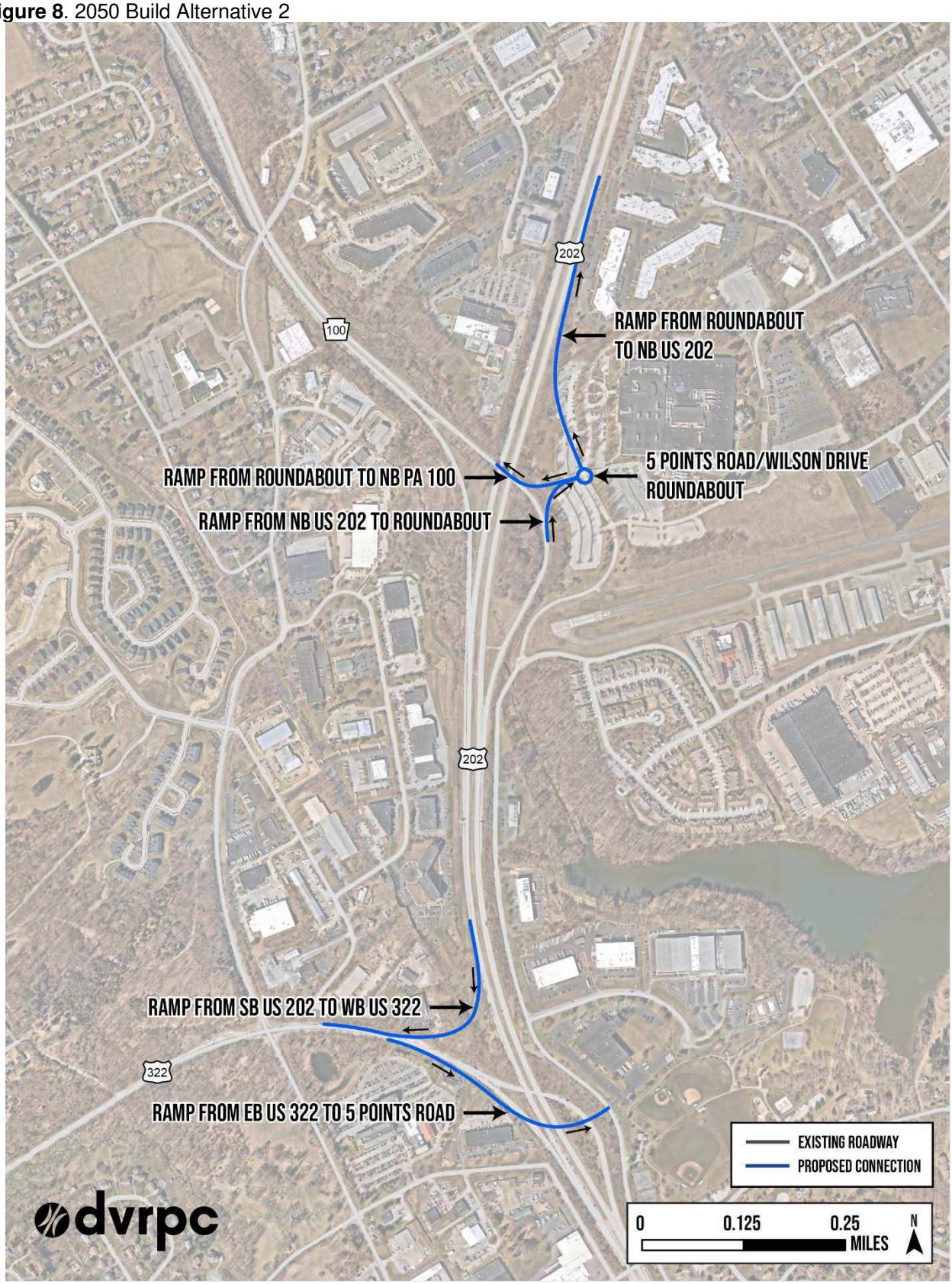
Build Alternative 3 is shown in **Figure 9** on page 20.

Figure 7. 2050 Build Alternative 1



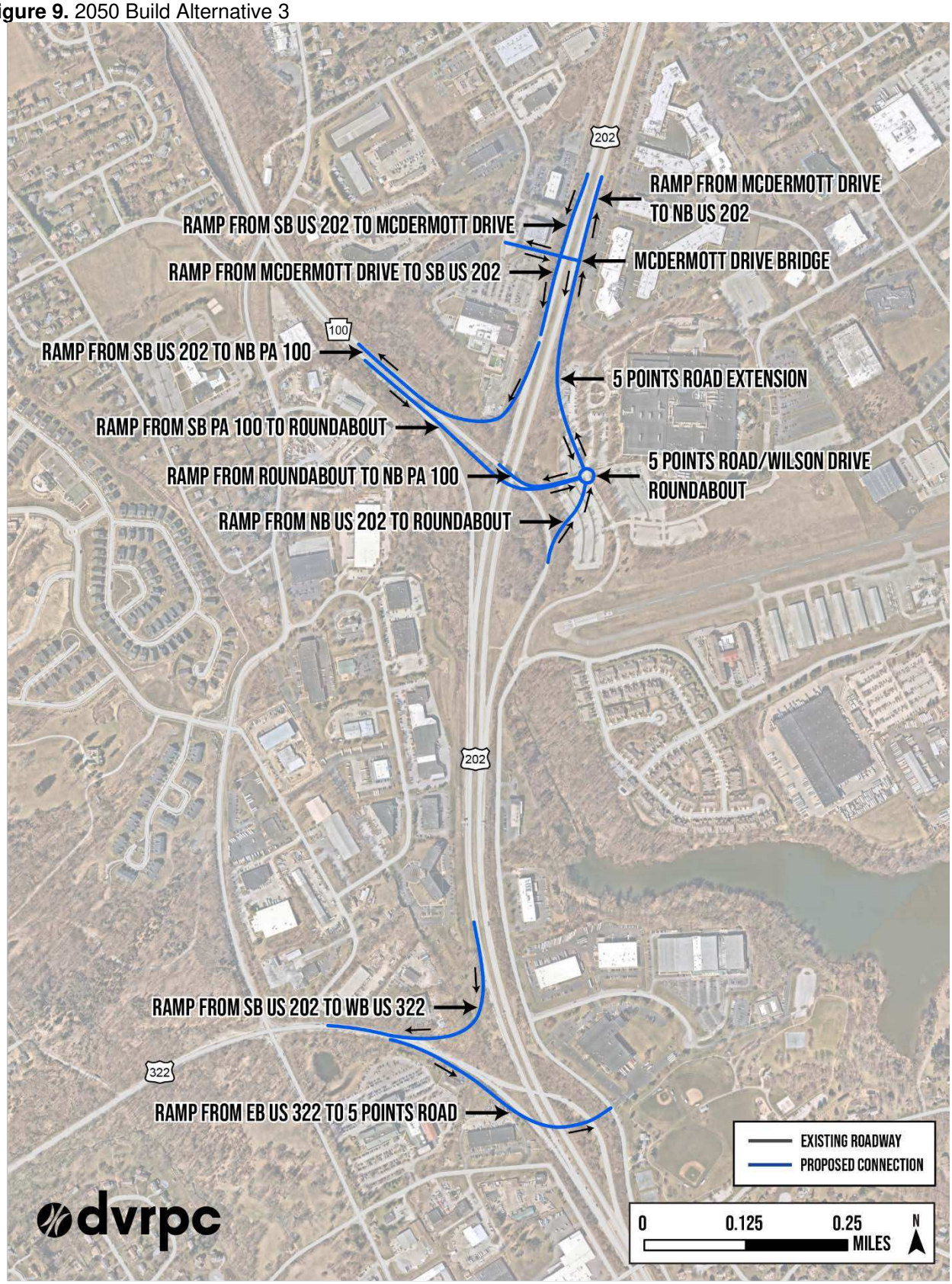
Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 8. 2050 Build Alternative 2



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 9. 2050 Build Alternative 3



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

CHAPTER 4:

Assessment of Peak Hour Traffic Operations

MICROSIMULATION MODELING

DVRPC conducted MTMCs and ATR counts throughout the study area. The vehicular peak hour volumes occurred from 7:30 AM to 8:30 AM and from 4:30 PM to 5:30 PM. The project team used PTV Vissim traffic simulation software to analyze traffic operations for these peak hours and quantify three highway performance measures: delay, level of service (LOS), and queue length.

- The **delay** is the amount of additional time beyond free flow travel time, in seconds, it takes for a vehicle to traverse an intersection. This value is an average for all vehicles completing the movement.
- The **LOS** is a letter grade (A through F) used to describe vehicle congestion and average delay by turning movement, approach, or intersection. LOS A, B, and C indicate a predictable and stable flow, LOS D indicates a predictable but approaching unstable flow, and LOS E and F indicate an unpredictable and unstable flow. The levels of service for both signalized and unsignalized intersections and their corresponding ranges of delay, in seconds, and interpretation are shown in **Table 2**.
- The **queue length** is the distance, in feet, between the intersection and the farthest vehicle waiting to enter. The value given is the average queue length approaching an intersection across a series of time intervals.

DVRPC developed traffic models and reported performance measures for existing (Year 2023), no build (Year 2050), and build (Year 2050) conditions.

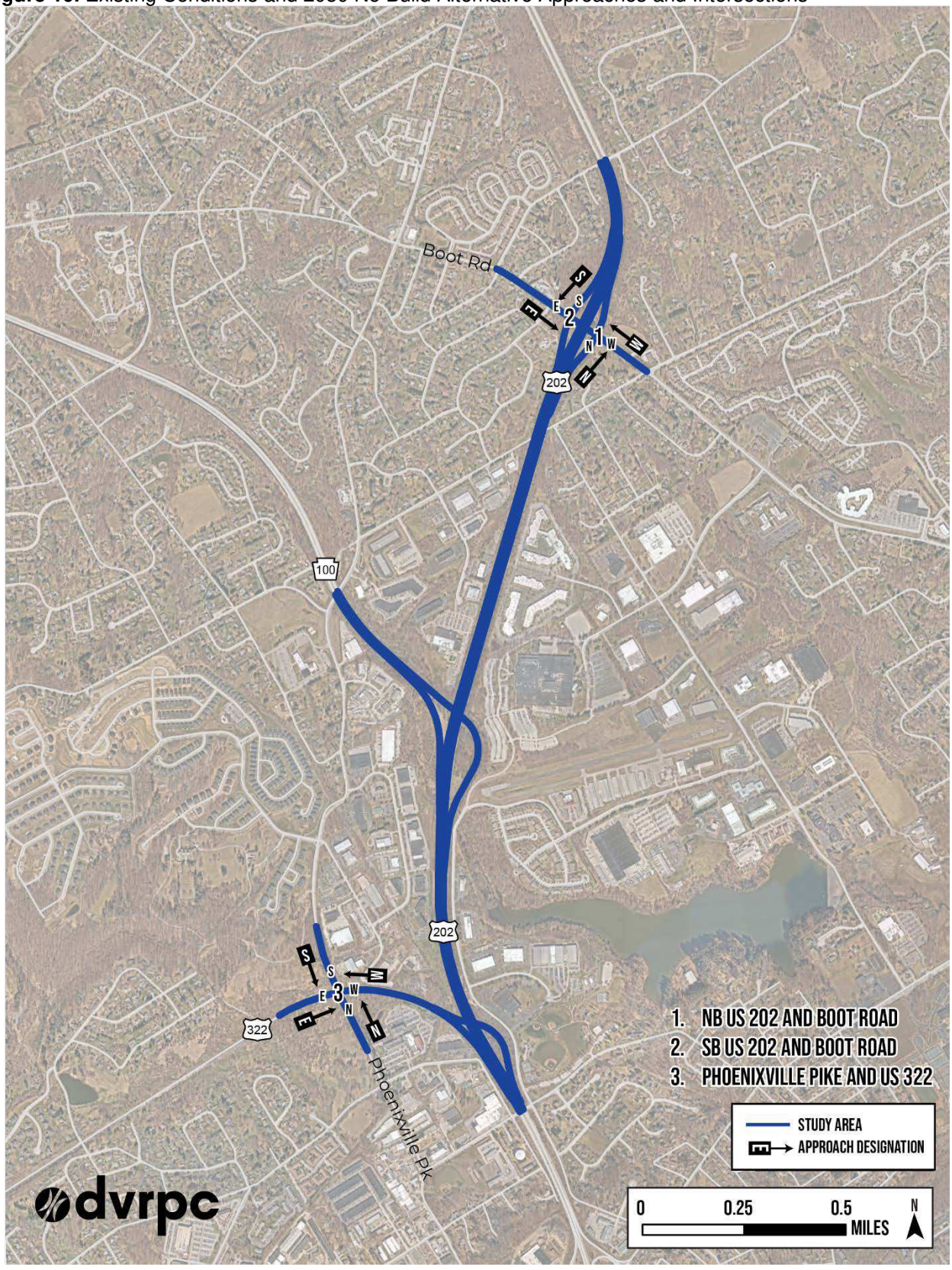
Table 2. Levels of Service (LOS)

Signalized Intersections		Unsignalized Intersections		Interpretation
LOS	Delay (s)	LOS	Delay (s)	
A	≤10	a	≤10	Predictable and Stable Flow
B	>10-20	b	>10-15	
C	>20-35	c	>15-25	
D	>35-55	d	>25-35	Predictable but Approaching Unstable Flow
E	>55-80	e	>35-50	Unpredictable and Unstable Flow
F	>80	f	>50	

Source: HCM 2000.

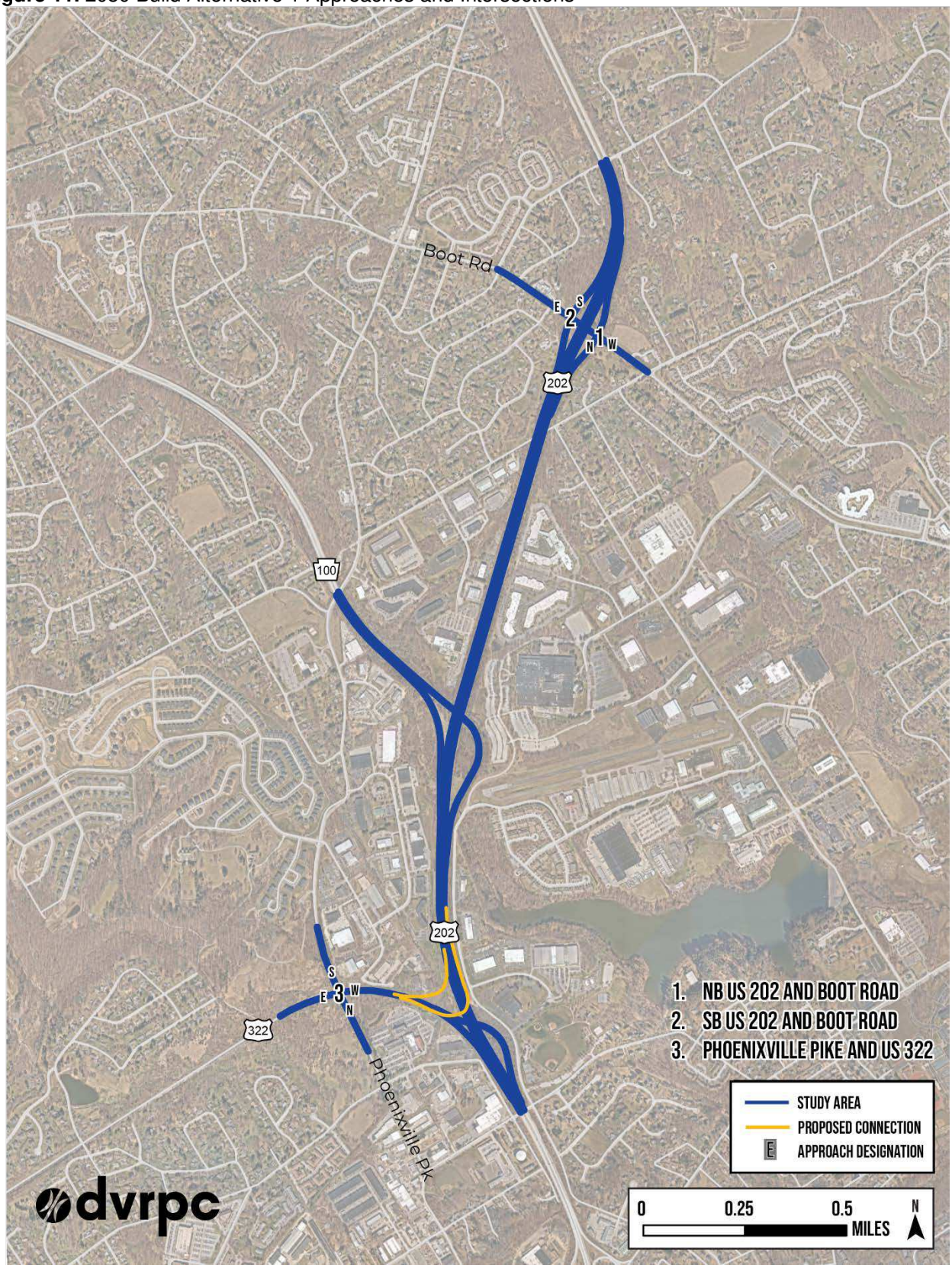
The project team prepared an Existing (Year 2023) microsimulation model for the AM and PM peak hours and calibrated it using TMCs, ATRs, and PennDOT traffic signal plans to accurately reflect 2023 traffic conditions. The project team also prepared a No Build (Year 2050) model and models of the three Build (Year 2050) alternatives for both peak hours. Both the No Build and Build models included projected 2050 traffic volumes.

Figure 10. Existing Conditions and 2050 No Build Alternative Approaches and Intersections



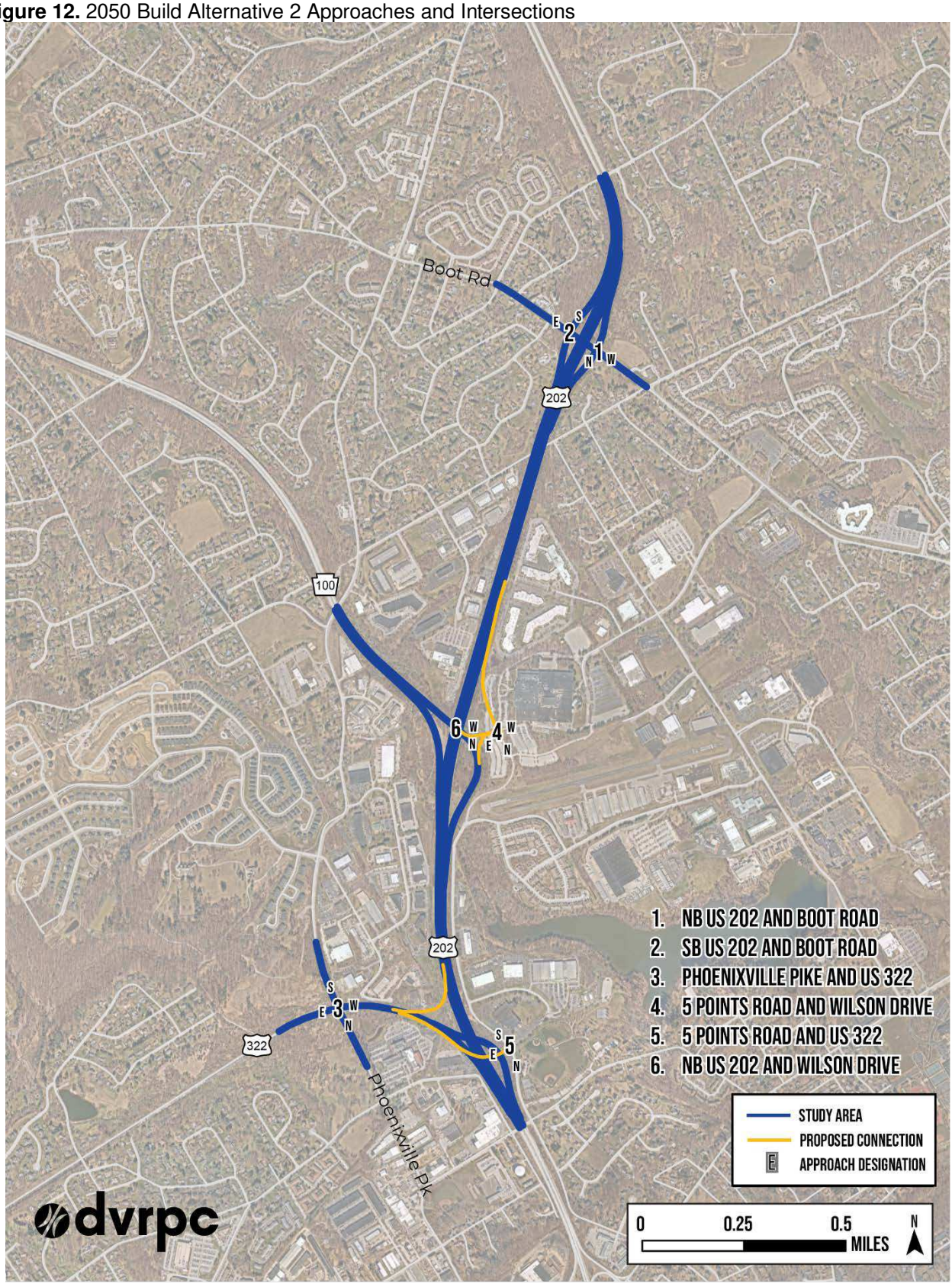
Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 11. 2050 Build Alternative 1 Approaches and Intersections



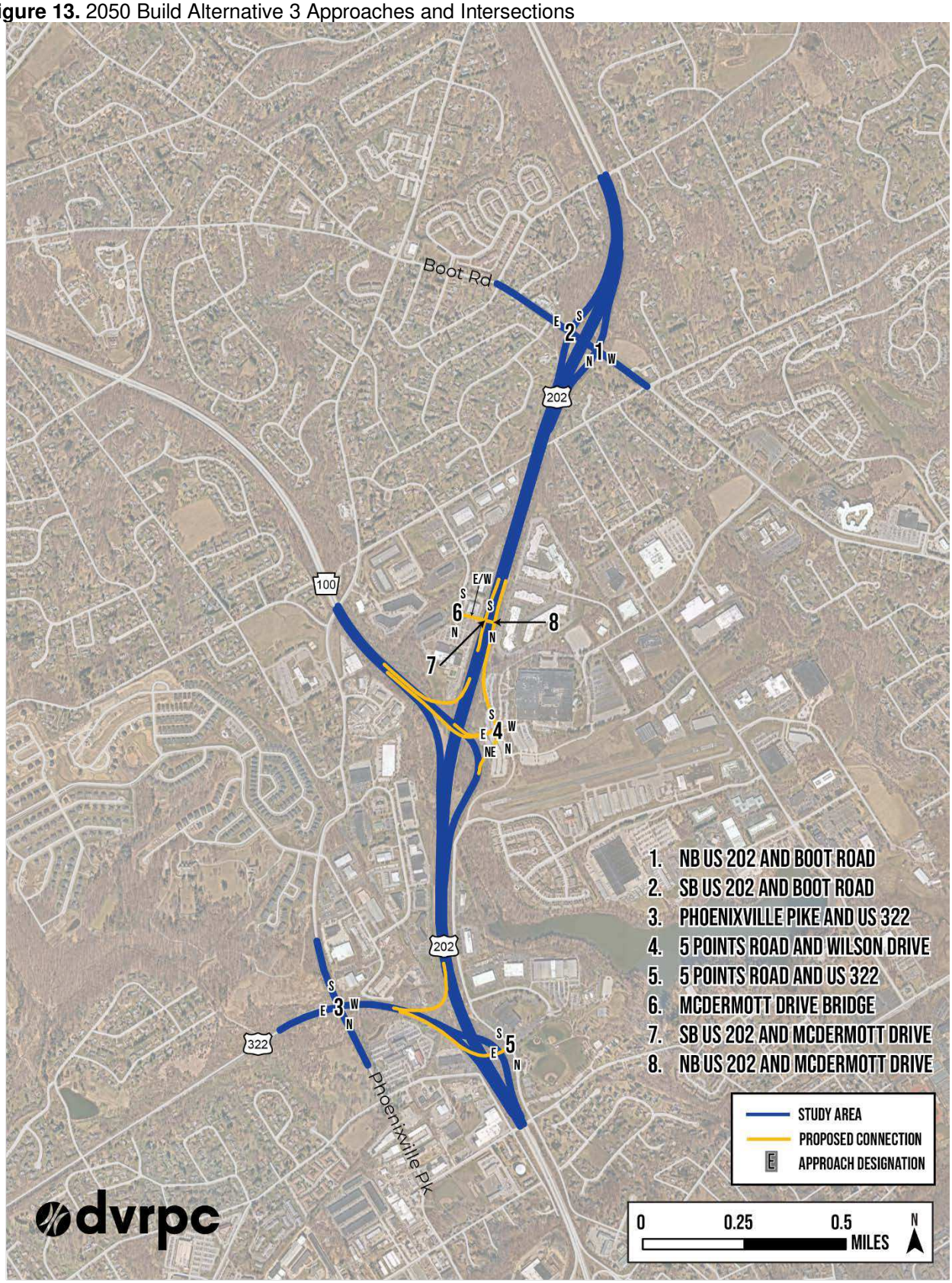
Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 12. 2050 Build Alternative 2 Approaches and Intersections



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 13. 2050 Build Alternative 3 Approaches and Intersections



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

EXISTING CONDITIONS

The 10 study approaches and three study intersections modeled in the existing conditions are shown in **Figure 10**. The study approach volumes, delays, LOS, and maximum queue length and the study intersection volume, delay, and LOS in the existing conditions are listed in **Table 3** for the AM peak hour and **Table 4** for the PM peak hour. In addition, the peak-hour LOS of the study intersections in the existing conditions are shown in **Figure 14 and 15**.

Table 3. Existing (Year 2023) AM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	195	37.2	D	224	1,950	7.0	A
		EB Boot Road	857	2.5	A	97			
		WB Boot Road	898	4.6	A	265			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	730	**72.7**	**E**	1,630	1,608	47.6	D
		EB Boot Road	392	42.2	D	493			
		WB Boot Road	486	14.3	B	264			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	331	35.8	D	311	2,444	21.5	C
		SB Phoenixville Pike	494	41.6	D	570			
		EB US 322	1,182	11.9	B	843			
		WB US 322	437	13.7	B	247			

Source: DVRPC 2023.

Table 4. Existing (Year 2023) PM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	299	72.1	E	506	2,449	15.1	B
		EB Boot Road	833	6.0	A	306			
		WB Boot Road	1,317	7.9	A	469			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	647	36.0	D	685	2,144	24.0	C
		EB Boot Road	680	25.6	C	746			
		WB Boot Road	817	13.2	B	371			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	604	35.4	D	554	2,643	24.3	C
		SB Phoenixville Pike	715	23.2	C	651			
		EB US 322	636	14.4	B	356			
		WB US 322	688	25.0	C	883			

Source: DVRPC 2023.

AM Peak Hour

During the AM Peak hour, one approach operates at LOS E or worse in the existing conditions:

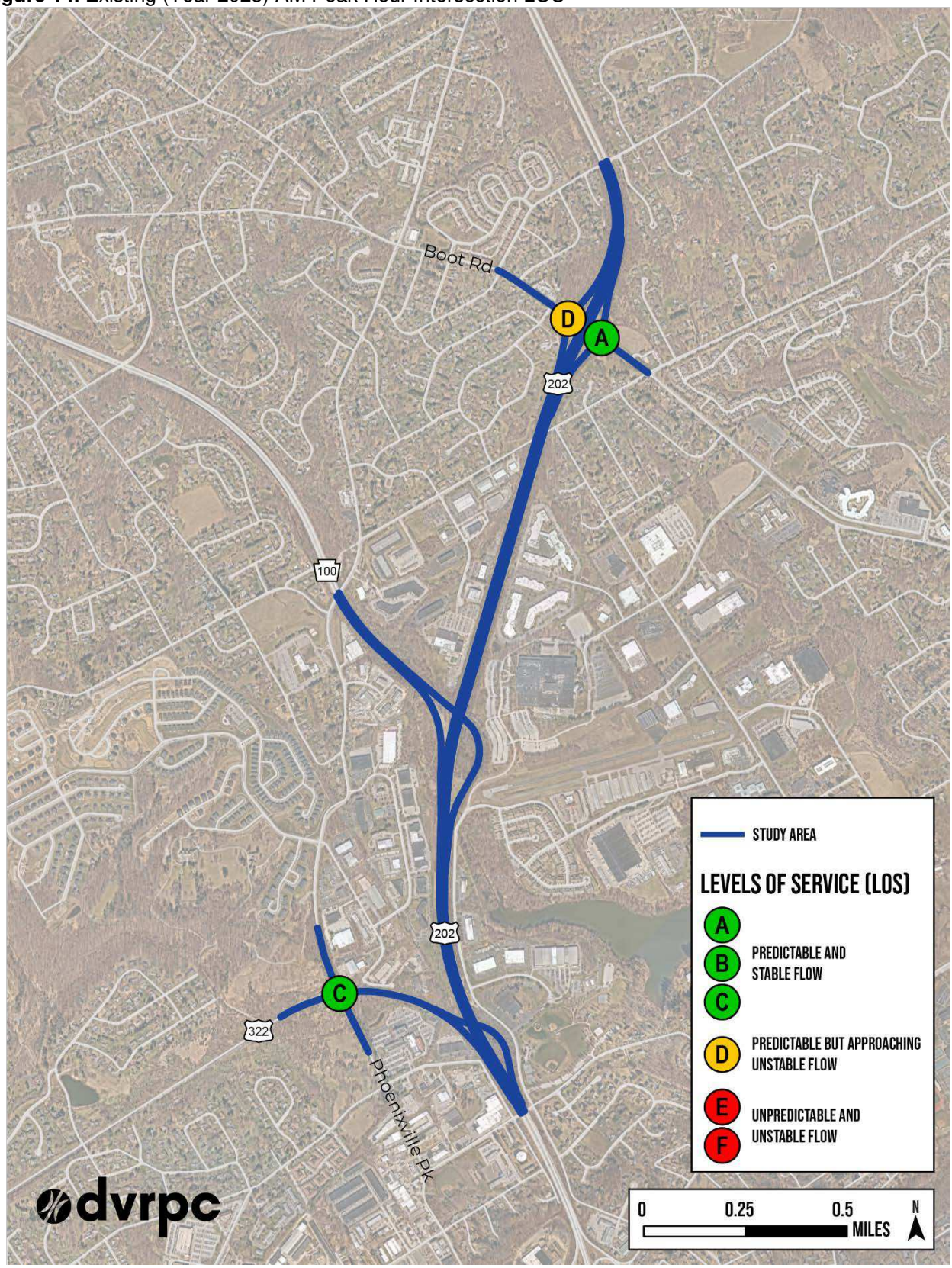
- The SB US 202 off-ramp at Boot Road (LOS E).

PM Peak Hour

During the PM peak hour, one approach operates at LOS E or worse in the existing conditions:

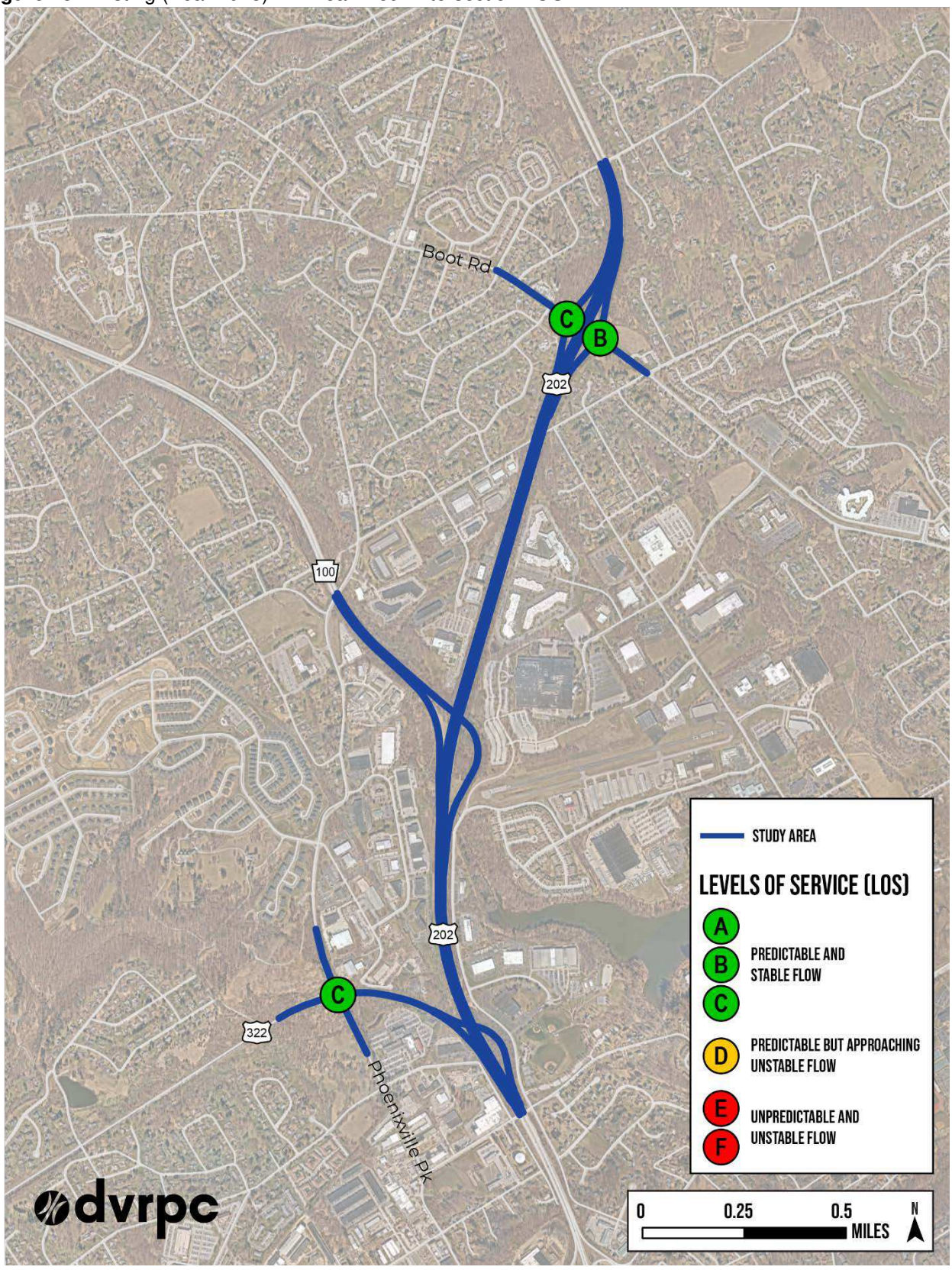
- The NB US 202 off-ramp at Boot Road (LOS E).

Figure 14. Existing (Year 2023) AM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 15. Existing (Year 2023) PM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

NO BUILD (YEAR 2050)

The 10 study approaches and three study intersections modeled in the 2050 No Build Alternative are shown in **Figure 10** on page 22 and listed in **Table 5** and **Table 6**. The study approach volumes, delays, LOS, and maximum queue length and the study intersection volume, delay, and LOS in the No Build Alternative are shown in **Table 5** for the AM peak hour and **Table 6** for the PM peak hour. In addition, the LOS of the study intersections in the No Build Alternative are shown in **Figure 16** on page 32 for the AM peak hour and **Figure 17** on page 33 for the PM peak hour.

Table 5. No Build (Year 2050) Alternative AM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	197	38.3	D	230.8	2,225	7.2	A
		EB Boot Road	922	2.6	A	113.8			
		WB Boot Road	1,106	5.5	A	319.6			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	728	**75.5**	**E**	1,673.3	1,791	48.3	D
		EB Boot Road	486	45.6	D	665.2			
		WB Boot Road	577	16.4	B	341.8			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	406	42.4	D	445.9	2,879	33.6	C
		SB Phoenixville Pike	596	**66.5**	**E**	1,111.4			
		EB US 322	1,433	22.9	C	922.2			
		WB US 322	444	15.8	B	242.6			

Source: DVRPC 2023.

Table 6. No Build (Year 2050) Alternative PM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	283	103.2	F	658.3	2,740	19.5	B
		EB Boot Road	914	7.8	A	340.5			
		WB Boot Road	1,543	11.1	B	646.8			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	621	38.3	D	667.7	2,358	25.7	C
		EB Boot Road	809	29.1	C	1,237.9			
		WB Boot Road	928	14.3	B	374.7			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	698	43.3	D	855.7	2,972	29.6	C
		SB Phoenixville Pike	844	25.9	C	1,036.3			
		EB US 322	745	18.7	B	579.5			
		WB US 322	685	31.9	C	968.3			

Source: DVRPC 2023.

AM Peak Hour

During the AM peak hour, two approaches operate at LOS E or worse in the No Build Alternative:

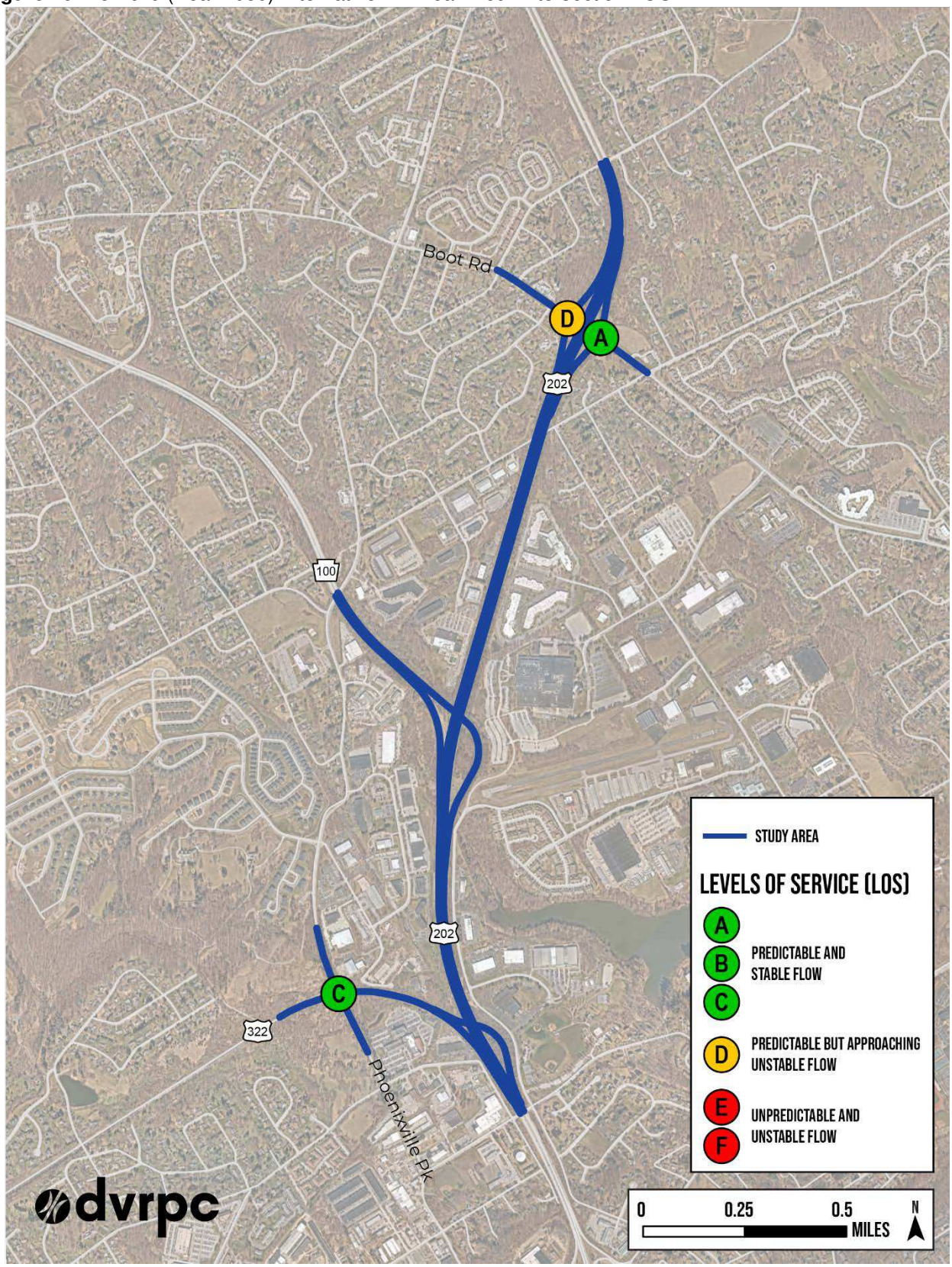
- The SB US 202 off-ramp at Boot Road (LOS E) and
- SB Phoenixville Pike at US 322 (LOS E).

PM Peak Hour

During the PM peak hour, one approach operates at LOS E or worse in the No Build Alternative:

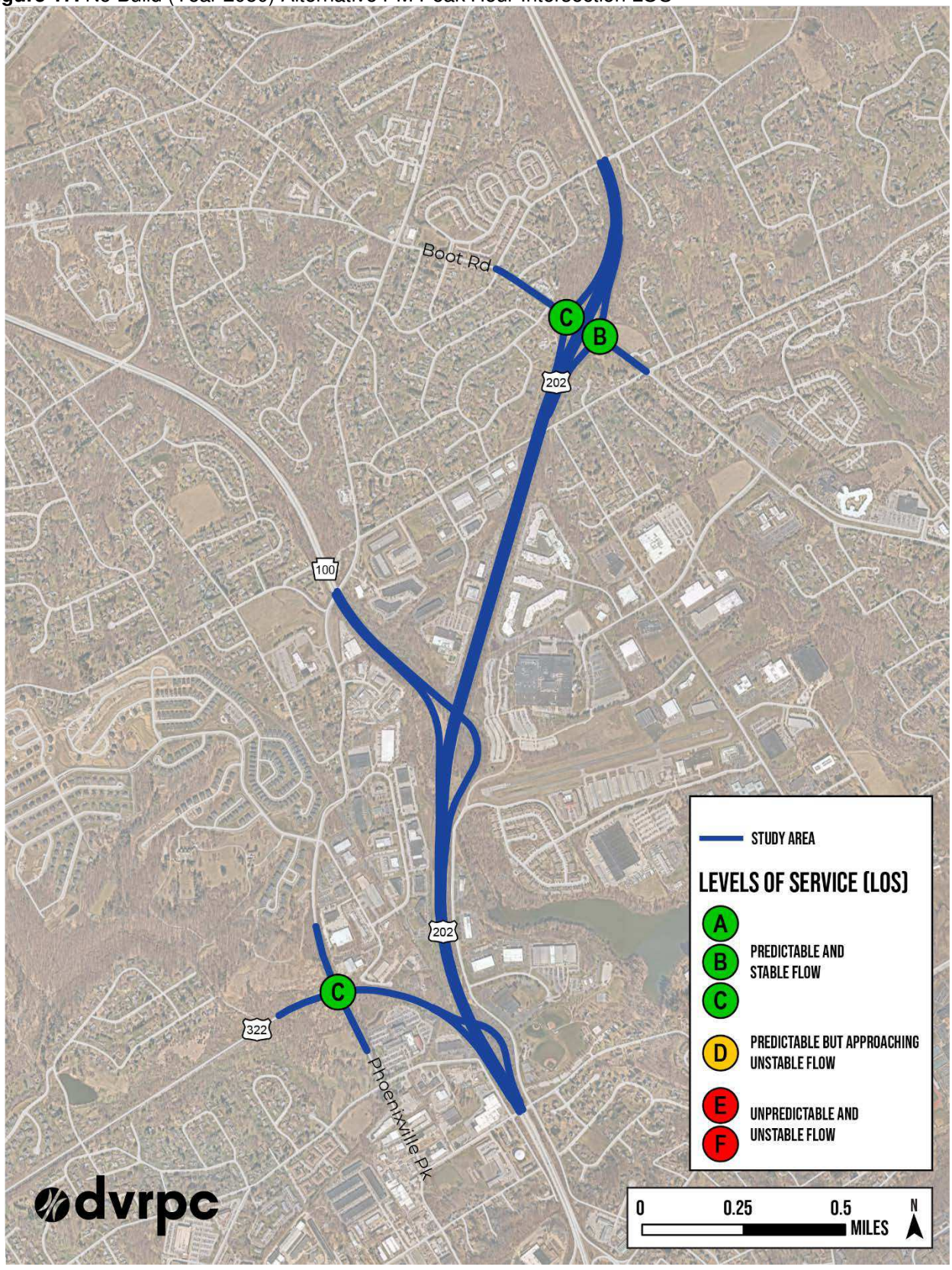
- The NB US 202 off-ramp at Boot Road (LOS F).

Figure 16. No Build (Year 2050) Alternative AM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 17. No Build (Year 2050) Alternative PM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

BUILD (YEAR 2050)

Three Build alternatives for the year 2050 were developed and evaluated in this study.

BUILD ALTERNATIVE 1

The 10 study approaches and three study intersections modeled in 2050 Build Alternative 1 are shown in

Figure 11 on page 23 and listed in **Table 7** and

Table 8. The study approach volumes, delays, LOS, and maximum queue length and the study intersection volume, delay, and LOS in Build Alternative 1 are listed in **Table 7** for the AM peak hour and

Table 8 for the PM peak hour. In addition, the LOS of the study intersections in Build Alternative 1 are shown in **Figure 18** on page 39 for the AM peak hour and **Figure 19** on page 40 for the PM peak hour.

Table 7. Build Alternative 1 (Year 2050) AM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	225	36.6	D	252.0	2,161	10.1	B
		EB Boot Road	828	2.1	A	91.8			
		WB Boot Road	1,108	10.6	B	521.0			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	637	**64.1**	**E**	1,501.0	1,841	40.4	D
		EB Boot Road	489	40.3	D	602.9			
		WB Boot Road	715	19.4	B	370.3			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	413	21.9	C	279.7	3,302	41.4	D
		SB Phoenixville Pike	477	**212.0**	**F**	1,632.5			
		EB US 322	1,443	12.0	B	919.4			
		WB US 322	969	9.6	A	524.1			

Source: DVRPC 2023.

Table 8. Build Alternative 1 (Year 2050) PM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	313	**58.1**	**E**	749.8	2,367	40.8	D
		EB Boot Road	601	7.3	A	344.1			
		WB Boot Road	1,453	50.9	D	766.3			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	359	30.7	C	311.9	1,998	40.6	D
		EB Boot Road	615	**83.5**	**F**	1,001.4			
		WB Boot Road	1,024	18.2	B	373.5			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	635	**116.8**	**F**	1,255.7	3,593	**61.9**	**E**
		SB Phoenixville Pike	633	**134.4**	**F**	1,633.9			
		EB US 322	1,039	14.9	B	805.0			
		WB US 322	1,286	36.9	D	923.5			

Source: DVRPC 2023.

AM Peak Hour

During the AM peak hour, two approaches operate at LOS E or worse in Build Alternative 1:

- The SB US 202 off-ramp at Boot Road (LOS E)
- SB Phoenixville Pike at US 322 (LOS F)

PM Peak Hour

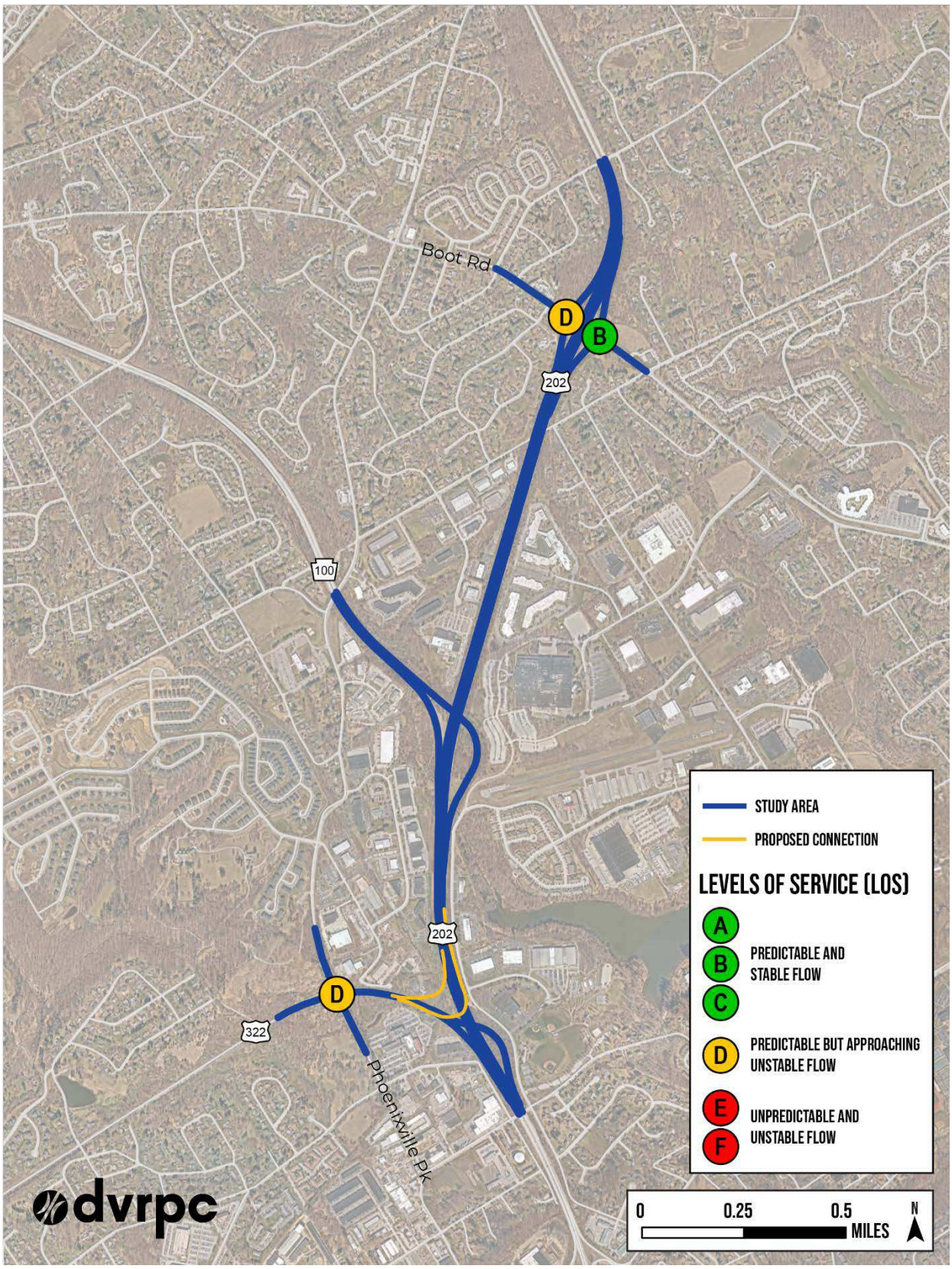
During the PM peak hour, four approaches operate at LOS E or worse in Build Alternative 1:

- The NB US 202 off-ramp at Boot Road (LOS E)
- EB Boot Road at SB US 202 (LOS F)
- NB Phoenixville Pike at US 322 (LOS F)
- SB Phoenixville Pike at US 322 (LOS F)

In addition, one intersection operates at LOS E or worse in Build Alternative 1 during the PM peak hour:

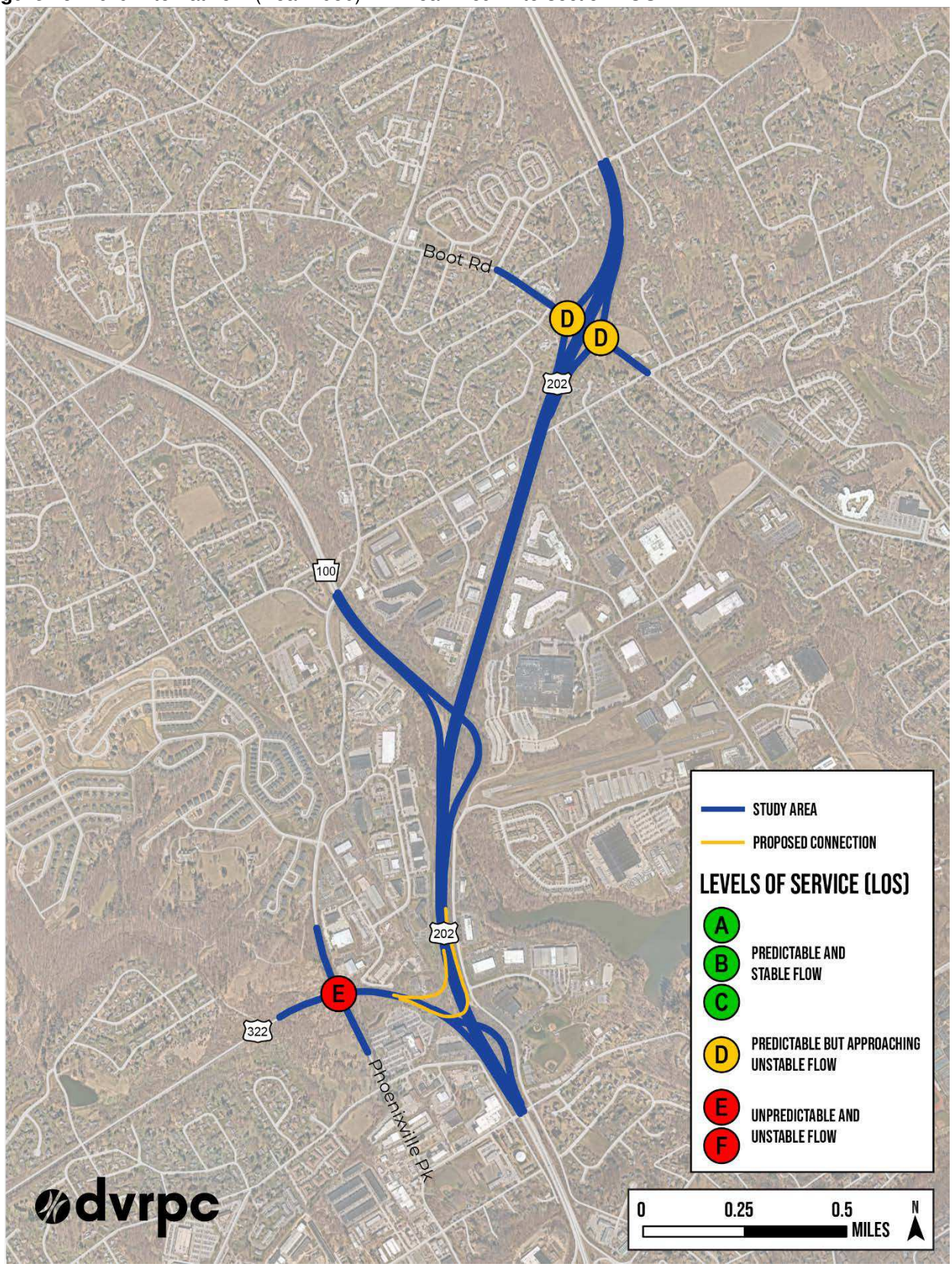
- Phoenixville Pike and US 322 (LOS E)

Figure 18. Build Alternative 1 (Year 2050) AM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 19. Build Alternative 1 (Year 2050) PM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

BUILD ALTERNATIVE 2

The 18 study approaches and six study intersections modeled in 2050 Build Alternative 2 are shown in

Figure 12 on page 24 and listed in **Table 9** and **Table 10**. The study approach volumes, delays, LOS, and maximum queue length and the study intersection volume, delay, and LOS in Build Alternative 2 are listed in **Table 9** for the AM peak hour and **Table 10** for the PM peak hour. In addition, the LOS of the study intersections in Build Alternative 2 are shown in **Figure 20** on page 46 for the AM peak hour and **Figure 21** on page 47 for the PM peak hour.

Table 9. Build Alternative 2 (Year 2050) AM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS [1]	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	227	35.7	D	253.2	2,230	24.7	C
		EB Boot Road	982	6.5	A	348.9			
		WB Boot Road	1,021	39.7	D	676.5			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	685	**81.0**	**F**	1,668.2	2,013	**58.3**	**E**
		EB Boot Road	591	**69.1**	**E**	1,198.8			
		WB Boot Road	737	28.6	C	376.7			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	527	**108.9**	**F**	1,050.9	3,327	**69.3**	**E**
		SB Phoenixville Pike	1,470	22.2	C	924.1			
		EB US 322	967	**127.2**	**F**	1,666.4			
		WB US 322	363	47.7	D	267.0			
4	5 Points Road and Wilson Drive Roundabout	NB 5 Points Road	577	1.4	a	94.2	755	1.7	a
		EB Wilson Drive	108	1.2	a	35.4			
		WB Wilson Drive	70	5.2	a	33.3			
5	5 Points Road and US 322	NB 5 Points Road	187	0.2	a	-	857	30.2	d
		SB 5 Points Road	102	0.3	a	-			
		EB US 322	568	**45.4**	**e**	679.9			
6	NB US 202 and Wilson Drive	NB US 202	1,142	0.7	a	-	1,379	1.8	a
		WB Wilson Drive	237	7.2	a	120.5			

Source: DVRPC 2023.

[1] Lowercase indicates unsignalized intersection LOS.

Table 10. Build Alternative 2 (Year 2050) PM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS [2]	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	214	62.6	E	400.1	2,346	37.8	D
		EB Boot Road	846	16.8	B	349.1			
		WB Boot Road	1,286	47.4	D	762.9			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	401	37.9	D	327.4	2,420	31.2	C
		EB Boot Road	936	44.2	D	1,667.2			
		WB Boot Road	1,083	17.6	B	382.7			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	563	42.9	D	696.8	3,292	63.8	E
		SB Phoenixville Pike	870	34.4	C	818.8			
		EB US 322	1,013	135.6	F	1,673.5			
		WB US 322	846	22.2	C	548.6			
4	5 Points Road and Wilson Drive Roundabout	NB 5 Points Road	621	16.9	c	184.6	910	21.9	c
		EB Wilson Drive	70	1.4	a	27.5			
		WB Wilson Drive	219	42.5	e	191.8			
5	5 Points Road and US 322	NB 5 Points Road	324	0.3	a	-	951	7.2	a
		SB 5 Points Road	229	0.3	a	-			
		EB US 322	398	16.9	c	243.9			
6	NB US 202 and Wilson Drive	NB US 202	1,093	1.0	a	-	1,612	14.3	b
		WB Wilson Drive	519	42.3	e	620.5			

Source: DVRPC 2023.

[2] Lowercase indicates unsignalized intersection LOS.

AM Peak Hour

During the AM peak hour, five approaches operate at LOS E or worse in Build Alternative 2:

- EB Boot Road at SB US 202 (LOS E)
- EB US 322 at Five Points Road (LOS e)
- The SB US 202 off-ramp at Boot Road (LOS F)
- NB Phoenixville Pike at US 322 (LOS F)
- EB US 322 at Phoenixville Pike (LOS F)

In addition, two intersections operate at LOS E or worse in Build Alternative 2 during the AM peak hour:

- SB US 202 and Boot Road (LOS E)
- Phoenixville Pike and US 322 (LOS E)

PM Peak Hour

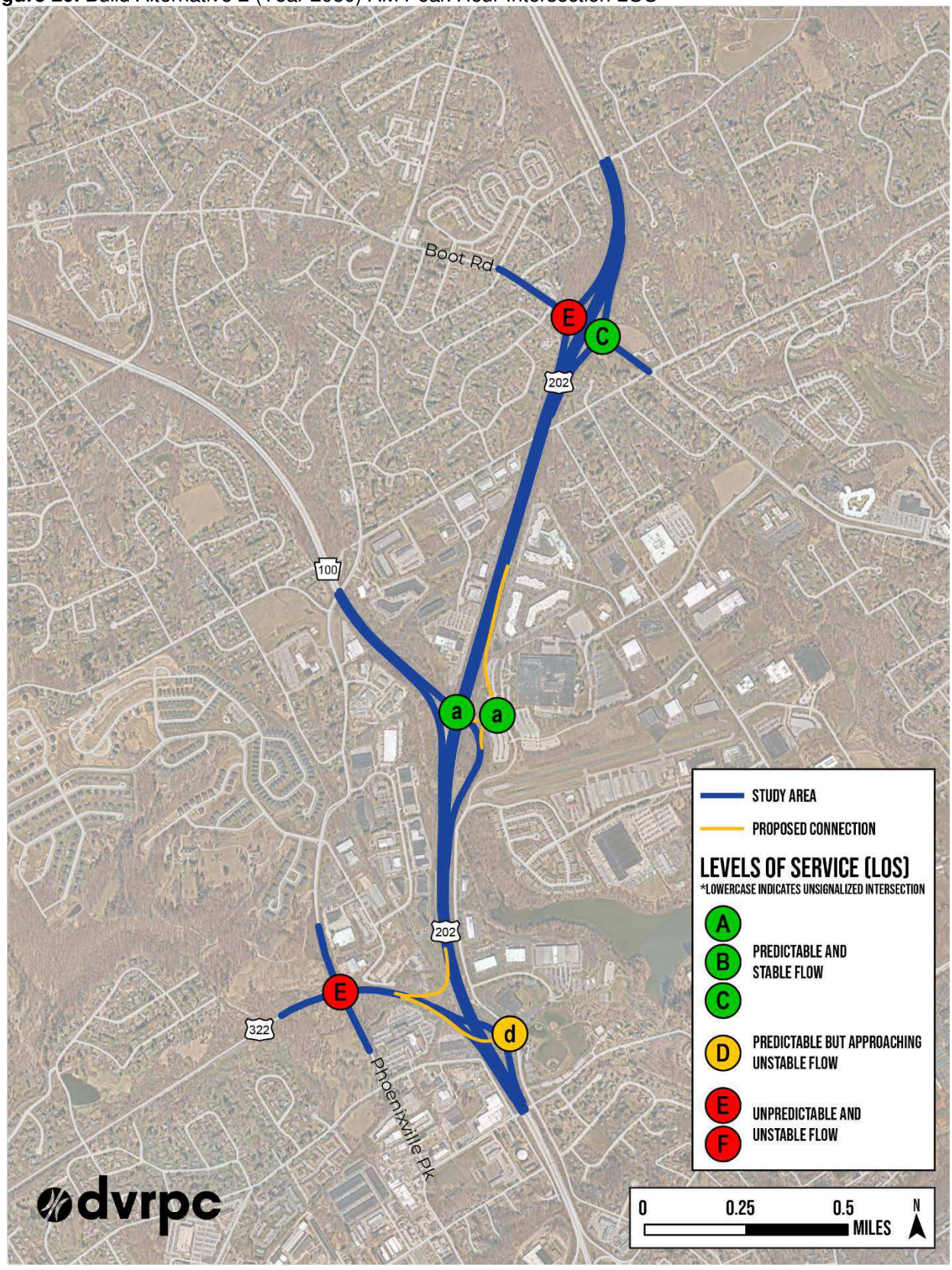
During the PM peak hour, four approaches operate at LOS E or worse in Build Alternative 2:

- The NB US 202 off-ramp at Boot Road (LOS E)
- WB Wilson Drive at Five Points Road (LOS e)
- WB Wilson Drive at NB US 202 (LOS e)
- EB US 322 at Phoenixville Pike (LOS F)

In addition, one intersection operates at LOS E or worse in Build Alternative 2 during the PM peak hour:

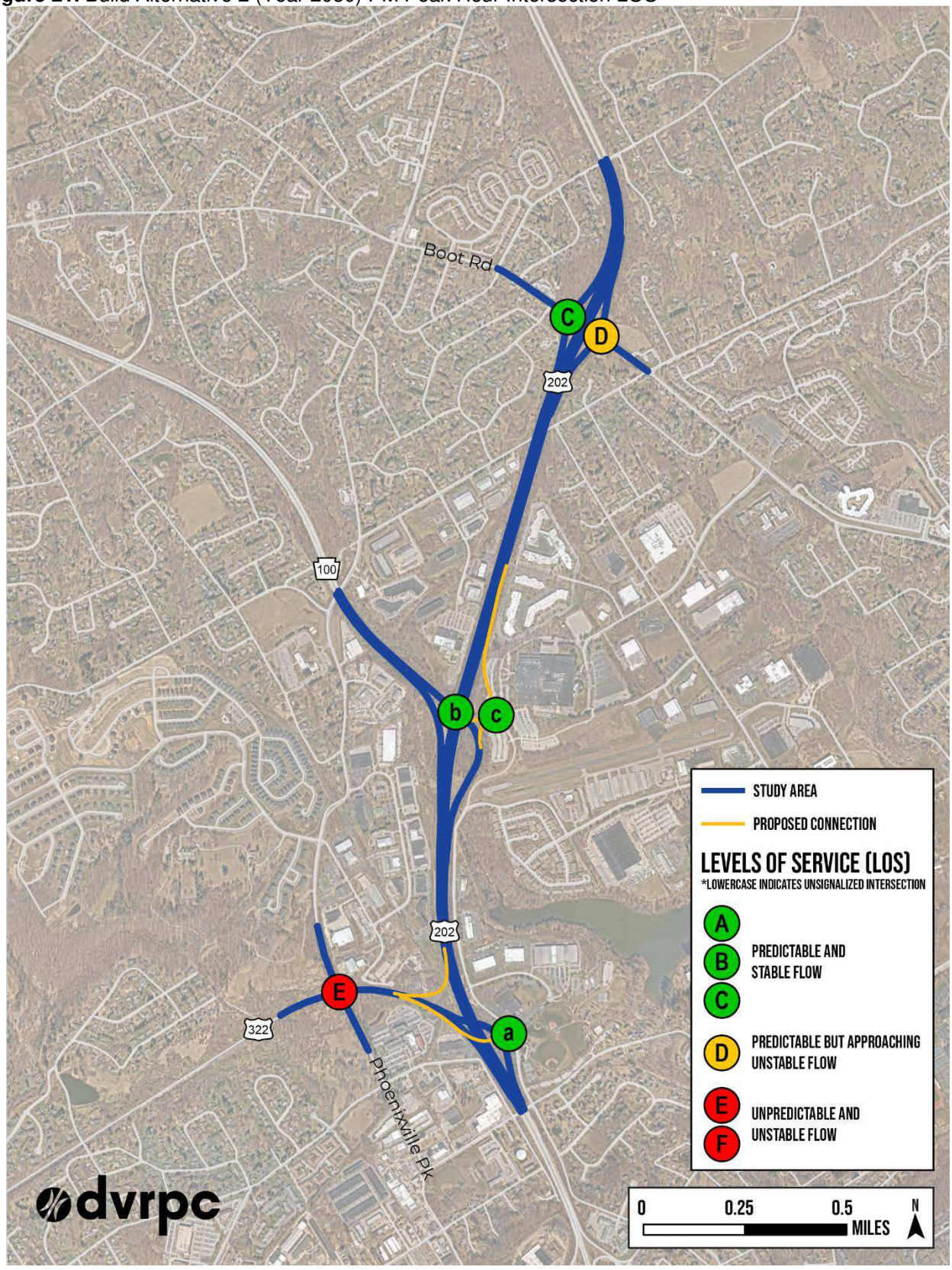
- Phoenixville Pike and US 322 (LOS E)

Figure 20. Build Alternative 2 (Year 2050) AM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 21. Build Alternative 2 (Year 2050) PM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

BUILD ALTERNATIVE 3

The 26 study approaches and eight study intersections modeled in 2050 Build Alternative 3 are shown in **Figure 13** on page 25 and listed in **Table 11** and **Table 12**. The study approach volumes, delays, LOS, and maximum queue length and the study intersection volume, delay, and LOS in Build Alternative 3 are listed in **Table 11** for the AM peak hour and **Table 12** for the PM peak hour. In addition, the LOS of the study intersections in Build Alternative 3 are shown in **Figure 22** on page 52 for the AM peak hour and **Figure 23** on page 53 for the PM peak hour.

Table 11. Build Alternative 3 (Year 2050) AM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS [3]	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	258	**157.7**	**F**	950.8	2,078	**66.4**	**E**
		EB Boot Road	859	9.9	A	345.2			
		WB Boot Road	961	**92.5**	**F**	762.0			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	445	46.7	D	631.7	1,936	35.7	D
		EB Boot Road	685	27.4	C	895.9			
		WB Boot Road	806	36.6	D	383.6			
3	Phoenixville Pike and US 322	NB Phoenixville Pike	635	44.5	D	850.6	3,182	46.7	D
		SB Phoenixville Pike	1,184	31.1	C	924.7			
		EB US 322	1,045	**71.2**	**E**	1,257.8			
		WB US 322	318	29.0	C	172.4			
4	5 Points Road and Wilson Drive Roundabout	NB 5 Points Road	560	3.0	a	172.0	1,069	3.0	a
		SB 5 Points Road	65	2.9	a	31.3			
		EB Wilson Drive	265	3.0	a	62.0			
		WB Wilson Drive	52	5.0	a	30.0			
		NEB Off-Ramp from NB US 202	127	2.0	a	48.0			

[3] Lowercase indicates unsignalized intersection LOS.

Table 11 continued

5	5 Points Road and US 322	NB 5 Points Road	188	0.4	a	-	674	46.3	e
		SB 5 Points Road	-	-	-	-			
		EB US 322	486	64.0	f	1,071.7			
6	McDermott Drive Bridge	NB McDermott Drive	184	1.7	a	-	603	5.7	a
		SB McDermott Drive	142	0.2	a	-			
		WB McDermott Drive Bridge	277	11.1	b	14.4			
7	SB US 202 and McDermott Drive	SB US 202 Off-Ramp	242	10.7	b	75.4	638	10.9	b
		EB McDermott Drive Bridge	326	13.1	b	150.8			
		WB McDermott Drive Bridge	70	1.0	a	10.0			
8	NB US 202 and McDermott Drive	NB 5 Points Road	393	0.1	a	-	561	3.0	a
		EB McDermott Drive Bridge	168	10.0	a	87.0			

Source: DVRPC 2023.

Table 12. Build Alternative 3 (Year 2050) PM Peak Hour Intersection Performance Results

Intersection		Approach					Intersection		
		Approach	Volume (veh)	Delay (s/veh)	LOS [4]	Max Queue (ft)	Volume (veh)	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	224	315.7	F	1,673.6	1,926	98.8	F
		EB Boot Road	895	8.1	A	341.9			
		WB Boot Road	807	139.1	F	767.3			
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	280	37.0	D	307.0	2,010	38.2	D
		EB Boot Road	967	36.7	D	1,652.2			
		WB Boot Road	763	40.6	D	382.3			

[4] Lowercase indicates unsignalized intersection LOS.

Table 12 continued

3	Phoenixville Pike and US 322	NB Phoenixville Pike	539	48.7	D	755.4	3,209	**66.2**	**E**
		SB Phoenixville Pike	864	39.0	D	872.3			
		EB US 322	998	**137.4**	**F**	1,670.2			
		WB US 322	808	19.2	B	569.5			
4	**5 Points Road and Wilson Drive Roundabout**	NB 5 Points Road	540	6.0	a	155.0	1,139	7.0	a
		SB 5 Points Road	38	8.4	a	45.4			
		EB Wilson Drive	289	4.0	a	86.0			
		WB Wilson Drive	212	16.0	a	162.0			
		NEB Off-Ramp from NB US 202	60	3.0	a	40.0			
5	**5 Points Road and US 322**	NB 5 Points Road	364	0.4	a	-	1,035	7.5	a
		SB 5 Points Road	373	0.7	a	-			
		EB US 322	298	24.7	c	234.0			
6	**McDermott Drive Bridge**	NB McDermott Drive	172	**54.5**	**f**	52.3	732	**71.9**	**f**
		SB McDermott Drive	336	**121.9**	**f**	851.6			
		WB McDermott Drive Bridge	224	10.2	b	15.7			
7	**SB US 202 and McDermott Drive**	SB US 202 Off-Ramp	136	10.8	b	32.9	776	**35.3**	**e**
		EB McDermott Drive Bridge	507	**50.6**	**f**	469.8			
		WB McDermott Drive Bridge	133	2.0	a	37.1			
8	**NB US 202 and McDermott Drive**	NB 5 Points Road	367	11.1	b	175.5	540	15.1	c
		EB McDermott Drive Bridge	173	23.5	c	152.8			

Source: DVRPC 2023.

AM Peak Hour

During the AM peak hour, four approaches operate at LOS E or worse in Build Alternative 3:

- EB US 322 at Phoenixville Pike (LOS E)
- The NB US 202 off-ramp at Boot Road (LOS F)
- WB Boot Road at NB US 202 (LOS F)
- EB US 322 at 5 Points Road (LOS f)

In addition, two intersections operate at LOS E or worse in Build Alternative 3 during the AM peak hour:

- NB US 202 and Boot Road (LOS E)
- 5 Points Road and US 322 (LOS e)

PM Peak Hour

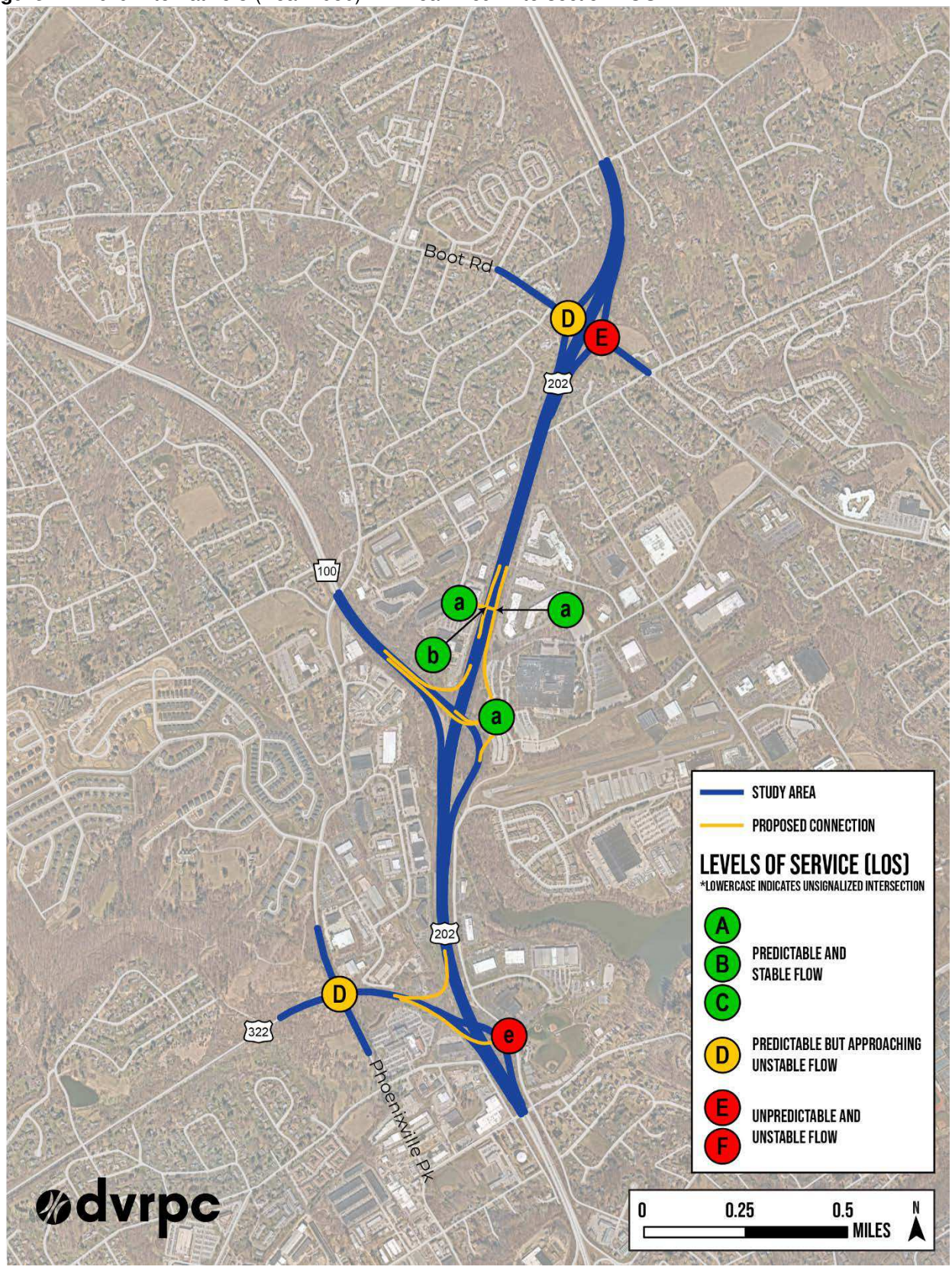
During the PM peak hour, six approaches operate at LOS E or worse in Build Alternative 3:

- The NB US 202 off-ramp at Boot Road (LOS F)
- WB Boot Road at NB US 202 (LOS F)
- EB US 322 at Phoenixville Pike (LOS F)
- NB McDermott Drive at the McDermott Drive Bridge (LOS f)
- SB McDermott Drive at the McDermott Drive Bridge (LOS f)
- EB McDermott Drive Bridge at SB US 202 (LOS f)

In addition, four intersections operate at LOS E or worse in Build Alternative 3 during the PM peak hour:

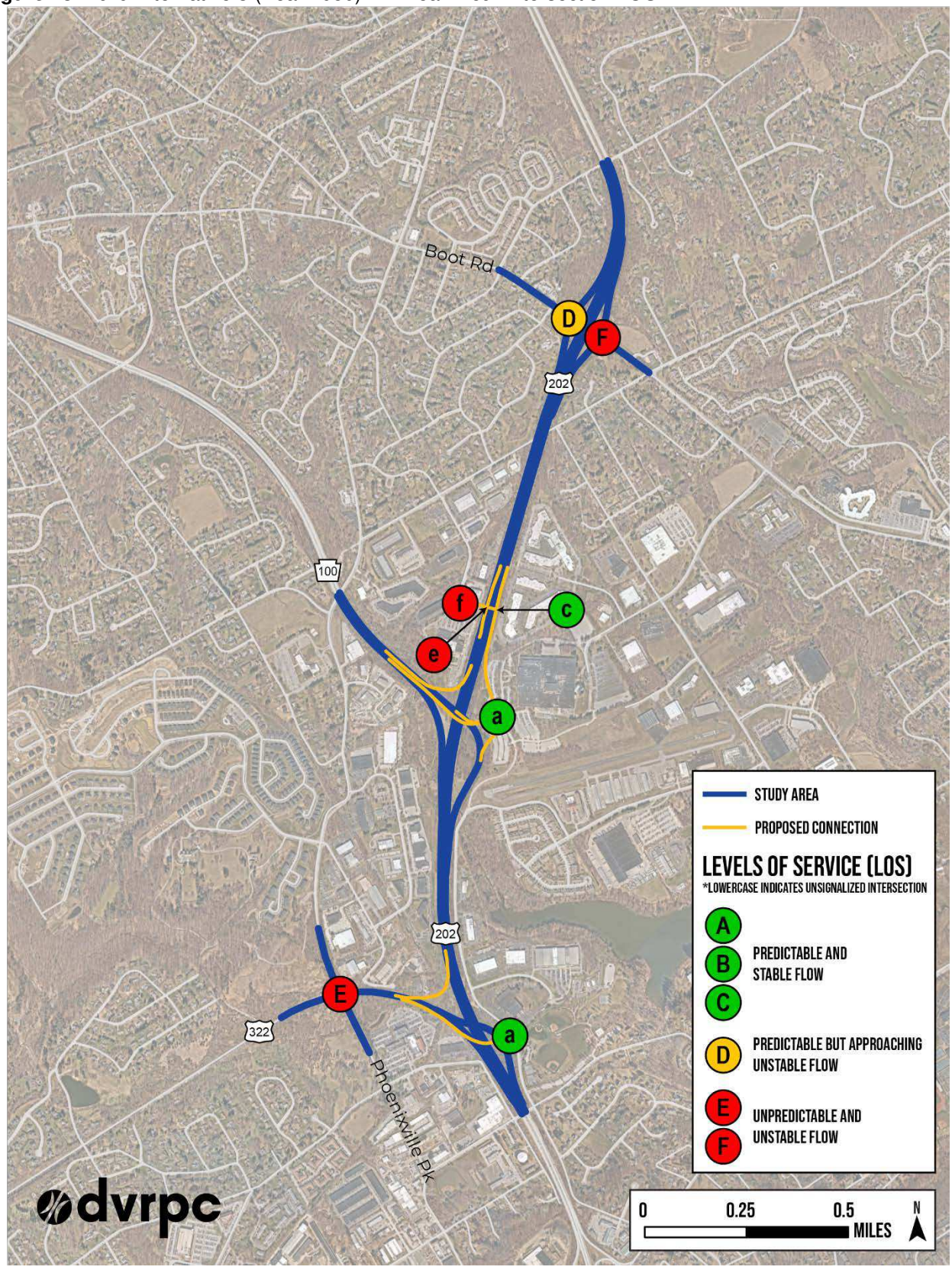
- Phoenixville Pike and US 322 (LOS E)
- SB US 202 and McDermott Drive (LOS e)
- NB US 202 and Boot Road (LOS F)
- The McDermott Drive Bridge intersection (LOS f)

Figure 22. Build Alternative 3 (Year 2050) AM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

Figure 23. Build Alternative 3 (Year 2050) PM Peak Hour Intersection LOS



Sources: DVRPC 2023, Chester County GIS 2020. Aerial Imagery: Nearmap 2023.

CHAPTER 5:

Summary of Findings

KEY FINDINGS

VOLUME COMPARISON

DVRPC modeled traffic volumes at twelve existing and proposed road segments throughout the study area for the No Build Alternative and three Build alternatives. These volumes are listed in **Table 13** for the AM peak hour and **Table 14** for the PM peak hour. An index for the links is shown in **Figure 24**.

Table 13. No Build and Build Alternatives (Year 2050) AM Peak Hour Volumes

Location		No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3
1	NB US 202 North of Boot Road	2,821	2,900	3,192	3,095
2	SB US 202 North of Boot Road	2,362	2,697	2,979	3,076
3	NB US 202 North of PA 100	2,308	2,602	2,890	2,934
4	SB US 202 North of PA 100	1,910	2,288	2,516	3,078
5	NB PA 100	1,096	1,024	1,270	1,523
6	SB PA 100	1,605	1,175	896	1,170
7	Ramp from SB US 202 to NB PA 100	-	-	-	188
8	Ramp from NB US 202 to WB US 322	443	388	472	468
9	Ramp from EB US 322 to NB US 202	-	744	-	-
10	Ramp from SB US 202 to WB US 322	-	584	547	588
11	NB US 202 South of US 322	3,409	2,875	3,685	3,769
12	SB US 202 South of US 322	4,358	3,555	3,616	1,808

Source: DVRPC 2023.

Table 14. No Build and Build Alternatives (Year 2050) PM Peak Hour Volumes

Location		No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3
1	NB US 202 North of Boot Road	2,887	2,590	3,002	1,912
2	SB US 202 North of Boot Road	3,492	2,374	2,780	2,714
3	NB US 202 North of PA 100	2,296	2,283	2,792	1,964
4	SB US 202 North of PA 100	3,149	2,204	2,626	2,851
5	NB PA 100	1,312	1,136	1,544	1,707
6	SB PA 100	906	1,130	893	1,193
7	Ramp from SB US 202 to NB PA 100	-	-	-	409
8	Ramp from NB US 202 to WB US 322	1,312	747	547	525
9	Ramp from EB US 322 to NB US 202	-	628	-	-
10	Ramp from SB US 202 to WB US 322	-	526	565	546
11	NB US 202 South of US 322	2,291	2,788	3,566	2,832
12	SB US 202 South of US 322	4,047	3,440	3,604	3,680

Source: DVRPC 2023.

Figure 24. Link Volume Comparison Index

Source: DVRPC 2023.

LEVELS OF SERVICE COMPARISON

DVRPC modeled the delay, in seconds, and levels of service (LOS) of approaches and intersections throughout the study area as part of the traffic microsimulation modeling portion of this study. The three major intersections in the study area that are present in the No Build Alternative and all three Build alternatives are NB US 202 and Boot Road, SB US 202 and Boot Road, and Phoenixville Pike and US 322. The delay and LOS of these intersections are listed in **Table 15** for the AM peak hour and **Table 16** for the PM peak hour.

Table 15. No Build and Build Alternatives (Year 2050) AM Peak Hour Delay and LOS

Intersection		Approach	No Build Alternative		Build Alternative 1		Build Alternative 2		Build Alternative 3	
			Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	38.3	D	36.6	D	35.7	D	**157.7**	**F**
		EB Boot Road	2.6	A	2.1	A	6.5	A	9.9	A
		WB Boot Road	5.5	A	10.6	B	39.7	D	**92.5**	**F**
		OVERALL	**7.2**	**A**	**10.1**	**B**	**24.7**	**C**	**66.4**	**E**
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	**75.5**	**E**	**64.1**	**E**	**81.0**	**F**	46.7	D
		EB Boot Road	45.6	D	40.3	D	**69.1**	**E**	27.4	C
		WB Boot Road	16.4	B	19.4	B	28.6	C	36.6	D
		OVERALL	**48.3**	**D**	**40.4**	**D**	**58.3**	**E**	**35.7**	**D**
3	Phoenixville Pike and US 322	NB Phoenixville Pike	42.4	D	21.9	C	**108.9**	**F**	44.5	D
		SB Phoenixville Pike	**66.5**	**E**	**212.0**	**F**	22.2	C	31.1	C
		EB US 322	22.9	C	12.0	B	**127.2**	**F**	**71.2**	**E**
		WB US 322	15.8	B	9.6	A	47.7	D	29.0	C
		OVERALL	**33.6**	**C**	**41.4**	**D**	**69.3**	**E**	**46.7**	**D**

Source: DVRPC 2023.

AM Peak Hour

In the No Build Alternative during the AM peak hour, all major intersections operate at LOS D or better. In Build Alternative 1 during the AM peak hour, operations at the three major intersections are similar to that of the No Build Alternative. In Build Alternative 2 during the AM peak hour, the SB US 202 & Boot Road intersection and the Phoenixville Pike and US 322 intersection operate at LOS E. For Build Alternative 3 during the AM peak hour, the NB US 202 & Boot Road intersection operates at LOS E.

Table 16. No Build and Build Alternatives (Year 2050) PM Peak Hour Delay and LOS

Intersection		Approach	No Build Alternative		Build Alternative 1		Build Alternative 2		Build Alternative 3	
			Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
1	NB US 202 and Boot Road	NB US 202 Off-Ramp	103.2	F	58.1	E	62.6	E	315.7	F
		EB Boot Road	7.8	A	7.3	A	16.8	B	8.1	A
		WB Boot Road	11.1	B	50.9	D	47.4	D	139.1	F
		OVERALL	**19.5**	**B**	**40.8**	**D**	**37.8**	**D**	**98.8**	**F**
2	SB US 202 and Boot Road	SB US 202 Off-Ramp	38.3	D	30.7	C	37.9	D	37.0	D
		EB Boot Road	29.1	C	83.5	F	44.2	D	36.7	D
		WB Boot Road	14.3	B	18.2	B	17.6	B	40.6	D
		OVERALL	**25.7**	**C**	**40.6**	**D**	**31.2**	**C**	**38.2**	**D**
3	Phoenixville Pike and US 322	NB Phoenixville Pike	43.3	D	116.8	F	42.9	D	48.7	D
		SB Phoenixville Pike	25.9	C	134.4	F	34.4	C	39.0	D
		EB US 322	18.7	B	14.9	B	135.6	F	137.4	F
		WB US 322	31.9	C	36.9	D	22.2	C	19.2	B
		OVERALL	**29.6**	**C**	**61.9**	**E**	**63.8**	**E**	**66.2**	**E**

Source: DVRPC 2023.

PM Peak Hour

In the No Build Alternative during the PM peak hour, all intersections operate at LOS C or better. In Build Alternatives 1 and 2 during the AM peak hour, operations at the three major intersections are slightly worse than that of the No Build Alternative, with the Phoenixville Pike and US 322 intersection operating at LOS E. For Build Alternative 3 during the AM peak hour, the NB US 202 & Boot Road intersection fails and the Phoenixville Pike & US 322 intersection operates at LOS E.

CONCLUSION

The US 202 corridor is not only a significant growth area, but an important route for freight, employment, and connections to other regions. This future model represents the inclusion of likely future growth along the corridor by referencing both Connections 2050 projections, along with the inclusion of new and planned development.

The 2050 future traffic model of the study area shows significant growth in traffic while maintaining acceptable intersection levels of service. Three build alternatives were considered, each with additional potential connections to and from US 202 and local roads and businesses.

All build alternatives show some attraction to new connections, as they would provide access between developments and major roadways that do not currently exist. However, the additional volume resulting from these new connections would create delay at the signalized intersections within the study area. These additional connections would come at the cost of added delay, in addition to the costs associated with planning, design, and construction. The flyover options would be particularly expensive and potentially outweigh the benefit of new connections.

US 202 Section 200 Connectivity Analysis

Publication Number: 24150

Date Published: April 2025

Geographic Area Covered:
West Whiteland Township, East Goshen Township, West Goshen Township, Chester County

Key Words:
Connectivity, Highway Operations, Growth

Abstract:
The US 202 corridor is not only a significant growth area, but an important route for freight, employment, and connections to other regions. This future model represents the inclusion of likely of future growth along the corridor by referencing both Connections 2050 projections, along with the inclusion of new and planned development.

The 2050 future traffic model of the study area shows significant growth in traffic while maintaining acceptable intersection levels of service. Three build alternatives were considered, each with additional potential connections to and from US 202 and local roads and businesses.

All build alternatives show some attraction to new connections, as they would provide access between developments and major roadways that does not currently exist. However, the additional volume resulting from these new connections would create delay at the signalized intersections within the study area. These additional connections would come at the cost of added delay, as well as additional planning and design, and significant funds to construct. The flyover options would be particularly expensive and potentially not worth the benefit of new connections.

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