WOODHAVEN ROAD TRAFFIC STUDY

Bucks, Philadelphia & Montgomery Counties, PA

WOODHAVEN ROAD PROJECT

Prepared for
Pennsylvania Department of Transportation
By
Delaware Valley Regional Planning Commission

June 2002

WOODHAVEN ROAD TRAFFIC STUDY

Bucks, Philadelphia & Montgomery Counties, PA

Prepared for
Pennsylvania Department of Transportation
By

Delaware Valley Regional Planning Commission
Bourse Building
111 South Independence Mall East
Philadelphia, PA 19106-2582

June 2002

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty, and intercity agency which provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the request and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector, and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the commission.

Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. This report was primarily funded by the Pennsylvania Department of Transportation and the Federal Highway Administration (FHWA). The authors, however, are solely responsible for its findings and conclusions, which may not represent the official views or policies of the funding agencies.

On the cover: Woodhaven Road Westbound at Evans Street.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF FIGURES

LIST OF FIGURES (CONTINUED)

APPENDIX A: List of Tables

APPENDIX B: List of Figures

APPENDIX B: List of Figures (Continued)

EXECUTIVE SUMMARY

This report updates previous efforts that developed 2015 and 2026 traffic forecasts for a no-build and 4 build alternatives for the Woodhaven Road project study area:

- Original Byberry Upgrade Alternative
- Extended Byberry Upgrade Alternative
- Original Woodhaven Expressway Alternative
- Extended Woodhaven Expressway Alternative

This update was necessary to reflect any changes in traffic volumes and socio-economic data since the previous analysis. In addition, geometric changes have been made to the alternatives and the study area has expanded to incorporate a more system wide approach. This analysis was conducted at the request of the Pennsylvania Department of Transportation (PENNDOT) and its consultants, who are engaged in preliminary designs for the completion of the Woodhaven Road Project.

The improvement alternatives currently under consideration are as follows:

- No-Build Alternative
- Byberry Road Upgrade Alternative
- Woodhaven Extension Alternative
- Modified Woodhaven Extension Alternative
- Bustleton Avenue Alternative
- Modified Bustleton Avenue Alternative

In preparation for forecasting future traffic volumes, the Delaware Valley Regional Planning Commission (DVRPC) collected traffic counts throughout the study area. Municipal and county planners were contacted to identify the significant proposed residential and commercial developments within the corridor. DVRPC's regional traffic simulation model was focused on the corridor and used to prepare 2026 traffic volume forecasts for study area roadways under each alternative.

The forecast for 2026 No-Build alternative indicates traffic growth on study area roadways is expected to range from less than 10% to more than 90%. Growth on the major east-west roads is expected to grow in a much narrower 15% to 30% range. Traffic growth is forecasted to increase less than 10% near the terminus of the Woodhaven Expressway on Byberry Road at the CSX Railroad crossing. At this location, motorists currently experience long delays as traffic volumes approach capacity for multiple hours on a daily basis. The parallel routes of Southampton Road and Red Lion Road are forecasted to increase at a faster rate as these roads have more available capacity than Byberry Road.

In the remaining alternatives, traffic entering and exiting the study area is fairly consistent indicating that no alternative markedly increases, as compared to the other alternatives, traffic volumes within the study area. Compared to the no-build all alternatives show a small increase in entry/exit volumes from the study area at three locations: County Line Road west of Huntingdon Pike, Byberry Road west of Huntingdon Pike and the Woodhaven Expressway east of the Roosevelt Boulevard. This indicates that the improvements do not cause a shift of through trips from parallel east-west routes outside the study area.

Since all the alternatives are expected to relieve congestion and reduce delays on Byberry Road, the choice becomes one more of preference than necessity. However, one good method for comparing alternatives is to compare the effectiveness of the alternatives at drawing traffic from parallel east-west routes (Southampton Road, Red Lion Road and Street Road). For example Red Lion Road is forecasted to increase from 33,200 to 37,800 by 2026 under the no-build alternative. In the Byberry Road upgrade, the traffic volume decreases to 37,200. In all other alternatives the traffic volume drops below 34,000, a clear indication that the other alternatives are more effective at drawing traffic to the Woodhaven Expressway than the Byberry Road Upgrade. This type of pattern is not seen on Street Road, as traffic does not significantly drop as a result of the improvements, supporting the previous statement that the improvements mostly benefit the study area traffic and do not significantly draw or affect trips from outside the study area.

I. INTRODUCTION

This report updates previous efforts that developed 2015 and 2026 traffic forecasts for a no-build and 4 build alternatives for the Woodhaven Road project study area:

- Original Byberry Upgrade Alternative
- Extended Byberry Upgrade Alternative
- Original Woodhaven Expressway Alternative
- Extended Woodhaven Expressway Alternative

This update was necessary to reflect any changes in traffic volumes and socio-economic data since the previous analysis. In addition, geometric changes have been made to the alternatives and the study area has expanded to incorporate a more system wide approach. This analysis was conducted at the request of the Pennsylvania Department of Transportation (PENNDOT) and its consultants, who are engaged in preliminary designs for the completion of the Woodhaven Road Project.

The improvement alternatives currently under consideration are as follows:

- No-Build Alternative
- Byberry Road Upgrade Alternative
- Woodhaven Extension Alternative
- Modified Woodhaven Extension Alternative
- Bustleton Avenue Alternative
- Modified Bustleton Avenue Alternative

The Woodhaven/PA 63 Expressway is located in the Somerton section of the City of Philadelphia, near the borders of Bucks and Montgomery Counties. The study area also includes a small section of Lower Moreland Township in Montgomery County. The existing 3.8 mile section of the Woodhaven/PA 63 Expressway is a six lane, limited access highway which connects US1 and I-95. The expressway terminates just to the west of US 1 (Roosevelt Boulevard) where local and regional traffic continuing west must exit via Evans Street to Byberry Road. As motorists exit the expressway onto city streets, lanes are reduced from six to two, creating severe traffic congestion on Evans Street and Byberry Road. Since crossings of the CSX tracks are few and far between, there are limited options to avoid this area.

A focused traffic assignment approach was used to estimate future traffic volumes based on the highway service levels provided by the Woodhaven Road alternatives. An enhanced assignment technique focused on a detailed study area was then used to produce corridor level highway and transit forecasts. This focused simulation process allows the use of DVRPC regional simulation models and increases the accuracy and detail of the travel forecasts within the detailed study area. At the same time, all existing and proposed highways throughout the

region and their impact on both regional and interregional travel patterns become an integral part of the simulation process.

The focused simulation process involved adding missing local streets to the network. Simulation zones inside the study area were subdivided so that traffic from existing and proposed land use developments could be loaded directly onto the network. The model's highway network within the study area was reviewed and modified as needed to reflect the detailed nature of the traffic improvements to be tested.

Section II of this report documents the existing physical characteristics of the Woodhaven Road corridor. Included are a brief description of existing land use and the physical characteristics of the study area roadways. Current daily traffic volumes throughout the study area are also presented in this section.

The next section (III) presents, in detail, the improvement alternatives that are part of this study and documents past efforts by DVRPC, which led to this analysis. Section IV presents and explains the travel forecasting methodology, with a brief discussion of the focused traffic simulation model used to develop traffic projections. The regional demographic and employment forecasts and corridor specific future development proposals, which form the basis for the traffic forecast, are also presented.

The last Section (V) presents an analysis of the travel forecasts for the Woodhaven Road corridor. These forecasts represent projected 2026 daily traffic volumes for the corridor and the surrounding network under each of the improvement alternatives. The analysis presents an explanation as to how traffic patterns and flows change between alternatives and the no-build. Also included in Appendix A are existing and future AADT's. Existing and projected AM and PM peak hour turning movements for intersections throughout the study area are included in Appendix B.

II. DESCRIPTION OF THE WOODHAVEN ROAD CORRIDOR

The Woodhaven/PA 63 Expressway is located in the Somerton section of the City of Philadelphia, near the borders of Bucks and Montgomery Counties. The study area also includes a small section of Lower Moreland Township in Montgomery County (*Map 1*).

A. Existing Facilities and Land Use

The existing 3.8-mile section of the Woodhaven/PA 63 Expressway is a six lane, limited access highway which connects US1 and I-95. The expressway terminates just to the west of US 1 (Roosevelt Boulevard) where local and regional traffic continuing west must exit via Evans Street to Byberry Road. As motorists exit the expressway onto city streets, lanes are reduced from six to two, creating severe traffic congestion on Evans Street and Byberry Road. Since crossings of the CSX tracks are few and far between, there are limited options to avoid this congested area.

The Woodhaven/PA 63 Expressway is the single most important east-west route in the local roadway network, as measured by average annual daily traffic volumes (AADT). It is the only route in northeast Philadelphia that connects I-95 to US 1. The expressway serves short and long distance haulers and commuters. It also provides access to Franklin Mills and the other recently developed regional shopping centers located on Knights Road to the east of the study area.

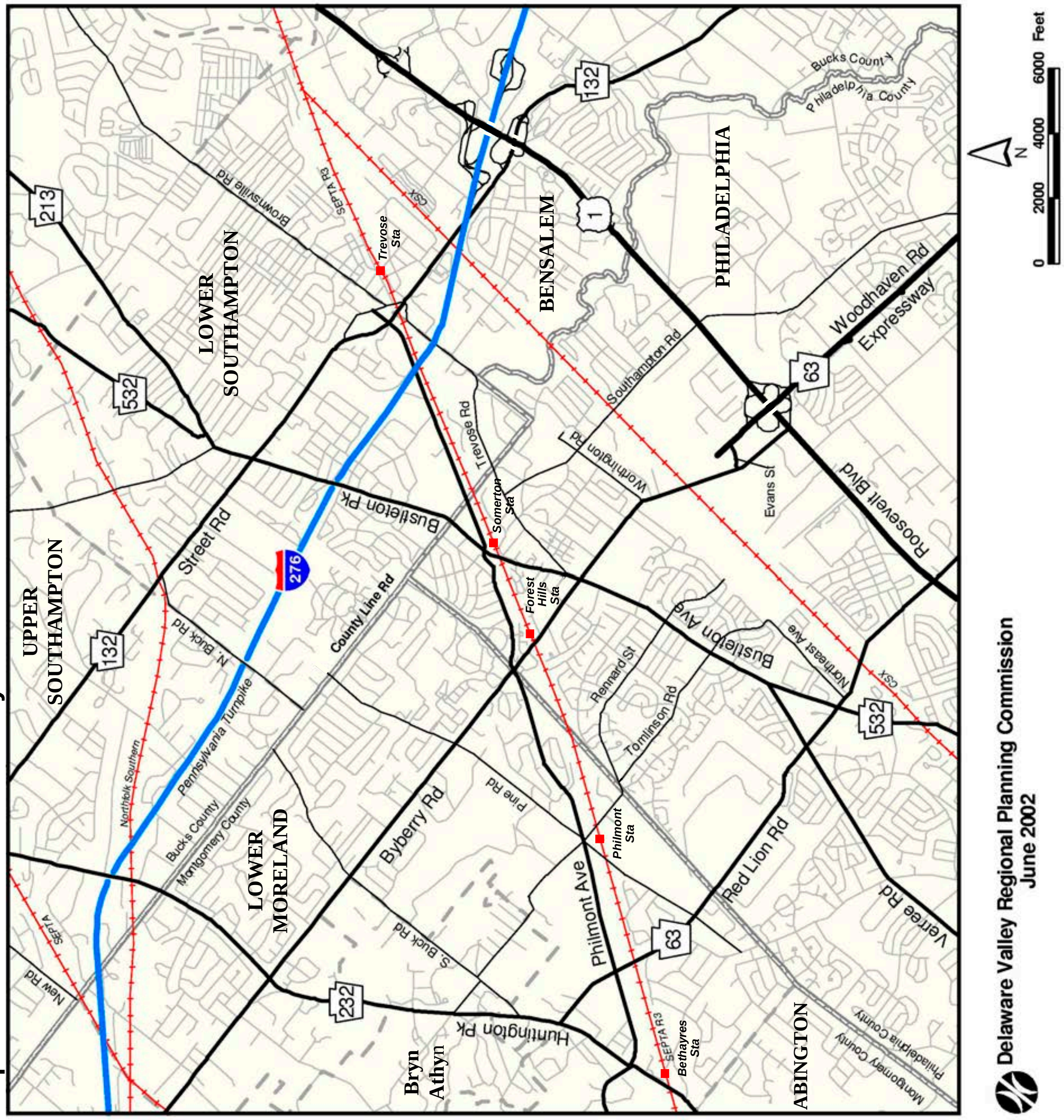
Two major routes parallel Byberry Road: Red Lion Road, 2 kilometers(1.24 miles) to the south; and Street Road, 3 Kilometers (1.86 miles) to the north. These road are significant because they carry traffic across the CSX tracks, as does Byberry Road. East-west traffic movement through the region is otherwise restricted by the tracks. Street Road connects I-95 with US 1, but is not a limited access facility. West of Bustleton Avenue, County Line Road also carries east-west traffic in the area.

Significant north-south routes in this area include US 1 and Bustleton Avenue. Bustleton Avenue collects and distributes traffic from Byberry Road and the other primary east-west routes. Philmont Avenue is also an important north-south route serving the community.

The study area is well served by SEPTA Regional Rail and four bus routes. The Forest Hills Station on the R3 line is located on Byberry Road between Philmont and Bustleton Avenue.

The Somerton community is comprised primarily of single-family detached residences with a mix of twin homes and low-rise apartments. Multi-family housing is largely concentrated along Byberry Road and Bustleton Avenue. To the east of the CSX tracks is Bennet Industrial Park. It contains

Map 1: Woodhaven Road Study Area



Delaware Valley Regional Planning Commission
June 2002

manufacturing plants, food production facilities, and distribution and storage facilities. RJR Nabisco and the United State Postal Service Bulk Mail Center are the largest employers in the community. Bustleton Avenue is the major commercial corridor of the study area, containing neighborhood shops.

B. Existing Traffic Volumes

DVRPC staff collected existing traffic counts in the study area. Locations were counted using pneumatic tube techniques during this effort and the resulting average daily volumes are displayed in *Figure II-1*. Detailed AADT information is included in Table A-1, ***Appendix A***.

Current traffic volumes on the Woodhaven Expressway approaching US 1 from the east are 58,600 daily, after US 1 the volumes drops to 24,500 vehicles. These vehicles exit the expressway onto Evans Street and proceed to Byberry Road where the heaviest traveled portions are between Bustleton Avenue and Evans Street, ranging from 26,400 to 32,000 vehicles per day. Bustleton Avenue, a four-lane facility, carries between 31,000 and 35,000 vehicles daily. It connects with both Philmont Avenue (11,000 to 17,600) and County Line Road. County Line Road has four travel lanes between Bustleton Avenue and Buck Road (14,100 to 20,200), two lanes from Buck Road to New Road (19,300 to 28,500), and four lanes west of New Road (28,500). Another major north-south corridor within the study area is Huntingdon Pike (PA 232). This corridor intersects with Philmont Avenue, Byberry Road and County Line Road. The traffic volumes are fairly consistent with volumes ranging from 17,000 to 19,000 vehicles per day. Red Lion Road, to the south of Byberry Road has a large variation in traffic volumes from 33,200 vehicles daily at the eastern end near US 1 to 6,300 between Philmont Avenue and Huntingdon Pike.

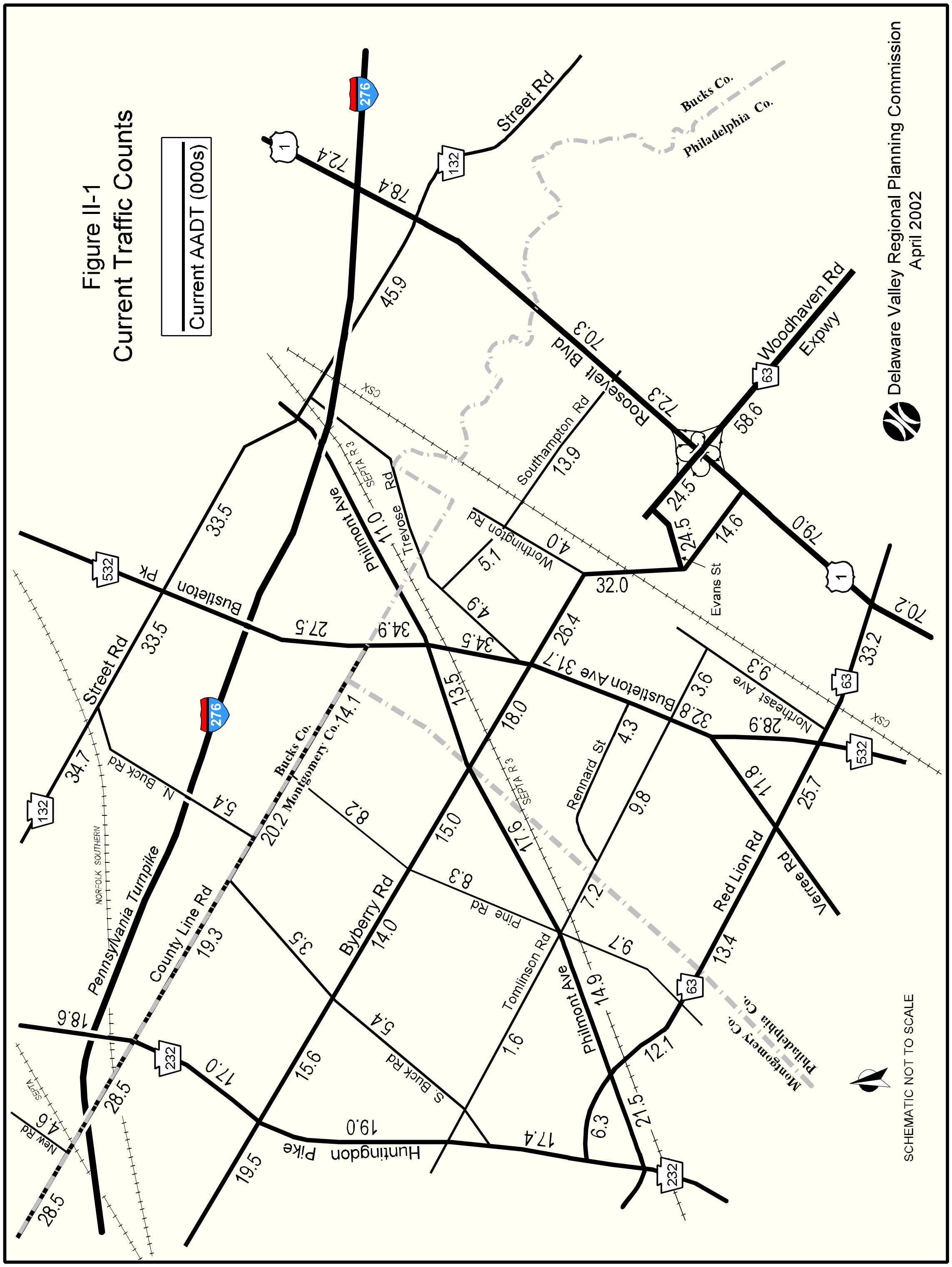


Figure II-1
Current Traffic Counts
Current AADT (000s)
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE
Woodhaven Rd
Expwy
Roosevelt Blvd
Street Rd
Bustleton Pk
Bustleton Ave
Philmont Ave
Trevose Rd
Southampton Rd
Worthington Rd
Evans St
Northeast Ave
Rennard St
Red Lion Rd
Verree Rd
Byberry Rd
Pine Rd
Tomlinson Rd
County Line Rd
Pennsylvania Turnpike
N. Buck Rd
S. Buck Rd
Huntingdon Pike
New Rd
Bucks Co.
Philadelphia Co.
Montgomery Co.
CSX
SEPTA R 3
NORFOLK SOUTHERN
72.4
78.4
45.9
70.3
72.3
58.6
24.5
24.5
14.6
79.0
70.2
33.2
13.9
4.0
5.1
11.0
4.9
32.0
26.4
34.5
34.9
27.5
33.5
33.5
34.7
31.7
32.8
3.6
9.3
28.9
11.8
25.7
13.5
18.0
14.1
4.3
9.8
20.2
5.4
8.2
15.0
17.6
8.3
7.2
13.4
19.3
3.5
14.0
9.7
14.9
12.1
18.6
17.0
28.5
4.6
28.5
15.6
5.4
1.6
19.0
17.4
6.3
21.5
19.5

C. Current Turning Volumes

Manual turning movement counts were collected within the study area as part of this effort at the major study area intersections. This data collection included the following critical intersections:

- Bustleton Avenue and Byberry Road: Total traffic entering the intersection is 4056 in the PM Peak with 68% of this on Bustleton Avenue. There are currently 4 lanes on Bustleton Avenue, and 2 lanes on Byberry Road.
- Bustleton Avenue and Philmont Avenue: This is a skewed intersection with 4293 vehicles entering in the PM peak.
- Bustleton Avenue and County Line Road: There is a high volume (370) currently turning left from Bustleton Avenue onto westbound County Line road in the evening peak. Traffic entering the intersection during the PM peak totals 3590.
- County Line Road and Huntingdon Pike: County Line Road is a four lane roadway through all major intersections except for the intersection with Huntingdon Pike where four lanes merge to two approximately a half mile to the west and a mile to the east. The volumes of traffic entering the intersection totals 2805 in the PM peak hour.

The detailed traffic turning movement counts at the study area intersections are shown in **Appendix B**.

(page intentionally left blank)

III. IMPROVEMENT ALTERNATIVES

Five improvement alternatives and a No-Build alternative were identified for the Woodhaven Road project. The improvement alternatives under consideration are similar to those studied previously, however based on some modifications, and an expanded network the alternatives were examined again in 2002 by DVRPC. Detailed descriptions of both the current alternatives under consideration and the previous alternatives analyzed are given below.

A. Alternatives Currently Under Consideration

The following six alternatives were modeled by DVRPC in 2002. The results update the previous analysis carried out in 2001.

1. No Build

Under this alternative no widening improvements are made to any of the study area highway facilities. The bridge over the CSX railway tracks on Byberry Road east of Worthington Road will be replaced on the existing alignment for all of the alternatives. This replacement will allow the removal of the weight restriction currently in place. See *Figure III-1*. The no-build alternative does assume that signal timing improvements will be implemented.

2. Byberry Road Upgrade Alternative

This alternative extends the Woodhaven Expressway westward from its present terminus at Evans Street, spans the existing CSX tracks, connects to existing Byberry Road just west of the Worthington Road intersection, and continues as a five-lane widening to Bustleton Avenue. It will continue west as a four-lane highway to Huntington Pike, and include possible improvements at intersections.

In this alternative, County Line Road will be widened to four lanes from Buck Road to just west of New Road and improvements at intersections on County Line Road from Bustleton Avenue to New Road will be evaluated. A new bridge will be built over the CSX tracks to realign Byberry Road and create a new intersection with Worthington Road and Woodhaven Road. Under this alternative, Byberry Road will become a state highway. *Figure III-2* displays the locations of the proposed improvements.

3. Woodhaven Extension Alternative

This alternative extends the Woodhaven Expressway westbound from its present terminus, and includes an eastbound off-ramp and an eastbound on-ramp at Evans Street. The extension will bridge over the existing CSX tracks, and continue as a four-lane highway through grade-separated interchanges at Bustleton Avenue and Philmont Avenue and then connect to a slightly realigned Byberry Road.

Between Worthington Road and Philmont Avenue, improvements to Byberry Road are expected to be localized to intersections. Byberry Road west of Philmont will have a cross-section of four lanes and will include possible improvements at the intersections. Evans Street will connect to Worthington Road via the existing Byberry Road south of the Expressway. County Line Road will be widened to four lanes from Buck Road to just west of New Road, and improvements at intersections on County Line Road from Bustleton Avenue to New Road will be evaluated. Intersection improvements on Bustleton Avenue from the new interchange with the extension to County Line Road will also be evaluated. *Figure III-3* displays the locations of the proposed improvements.

4. Modified Woodhaven Extension Alternative

This alternative extends the Woodhaven Expressway westbound from its present terminus, and includes an eastbound off-ramp and an eastbound on-ramp at Evans Street. The extension will bridge over the existing CSX tracks, and continue as a four-lane highway through grade-separated interchanges at Bustleton Avenue and Philmont Avenue and then connect to a slightly realigned Byberry Road.

Between Worthington Road and Philmont Avenue, improvements to Byberry Road are expected to be localized to intersections. Byberry Road west of Philmont will have a cross-section of three lanes and will include possible improvements at the intersections. Evans Street will connect to Worthington Road via the existing Byberry Road south of the Expressway. County Line Road will be widened to four lanes from Buck Road to just west of New Road, and improvements at intersections on County Line Road from Bustleton Avenue to New Road will be evaluated. Intersection improvements on Bustleton Avenue from the new interchange with the extension to County Line Road will also be evaluated. *Figure III-4* displays the locations of the proposed improvements.

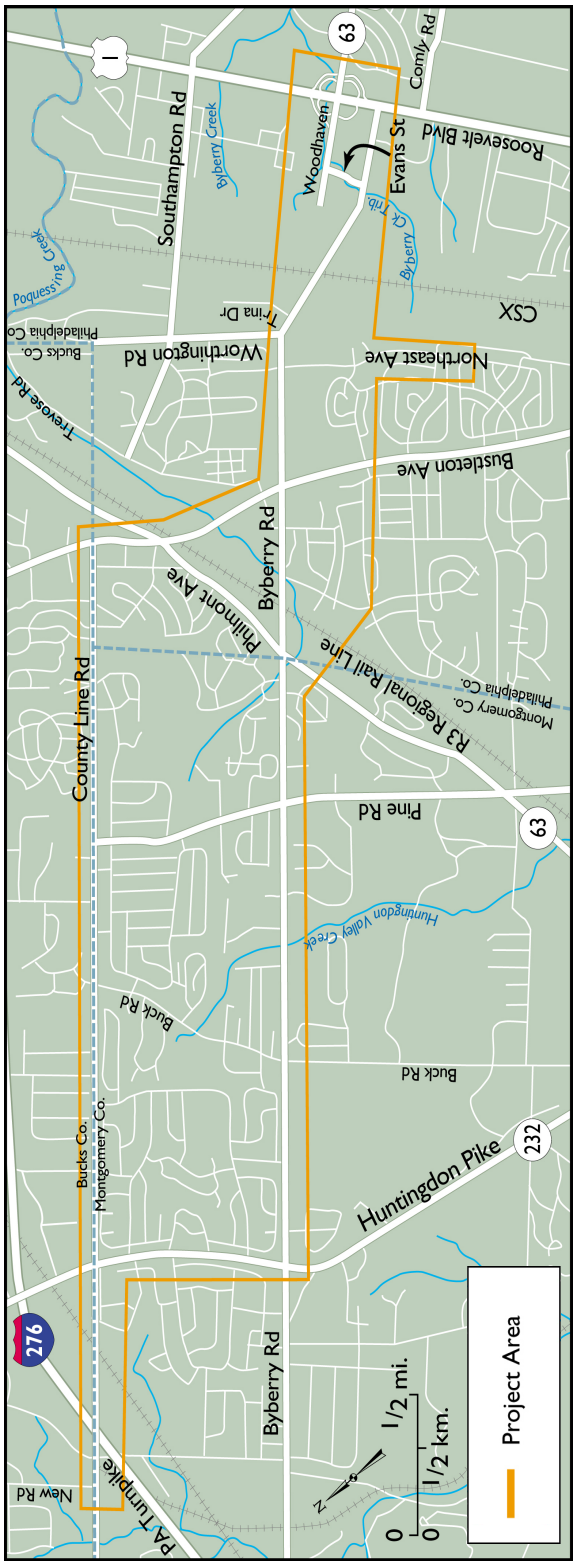


Figure III-1: No-Build Alternative

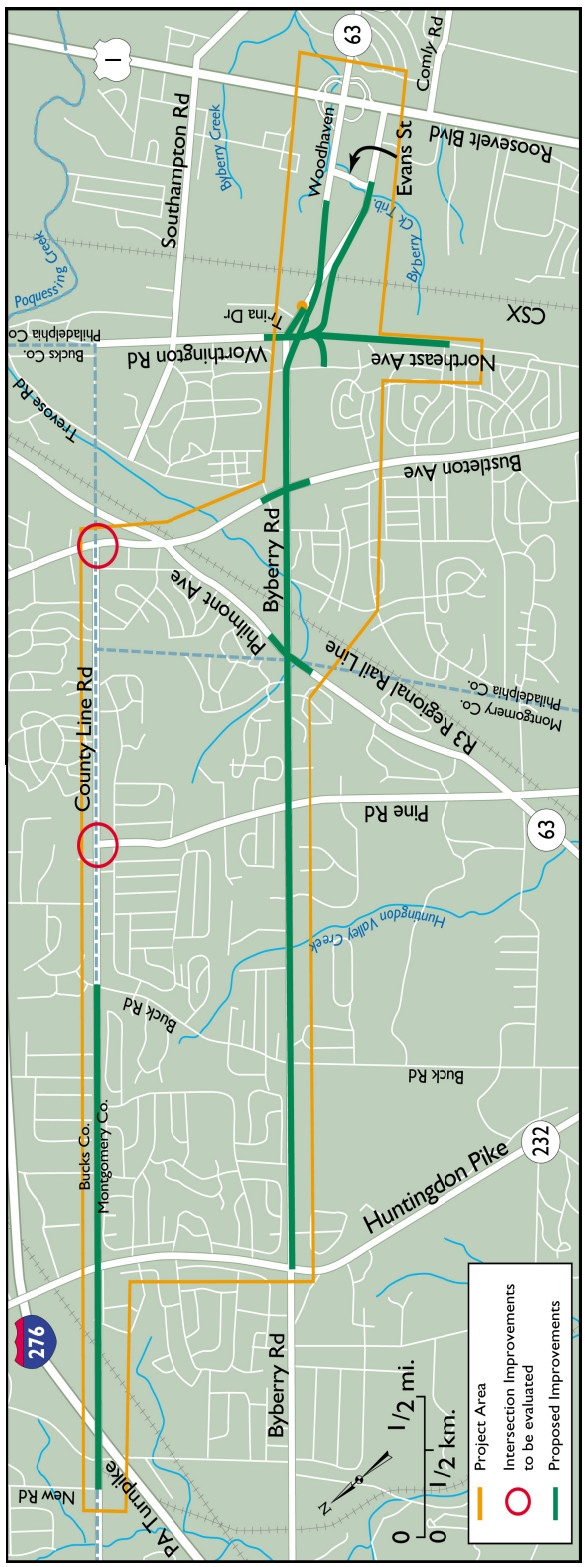


Figure III-2: Byberry Road Upgrade Alternative

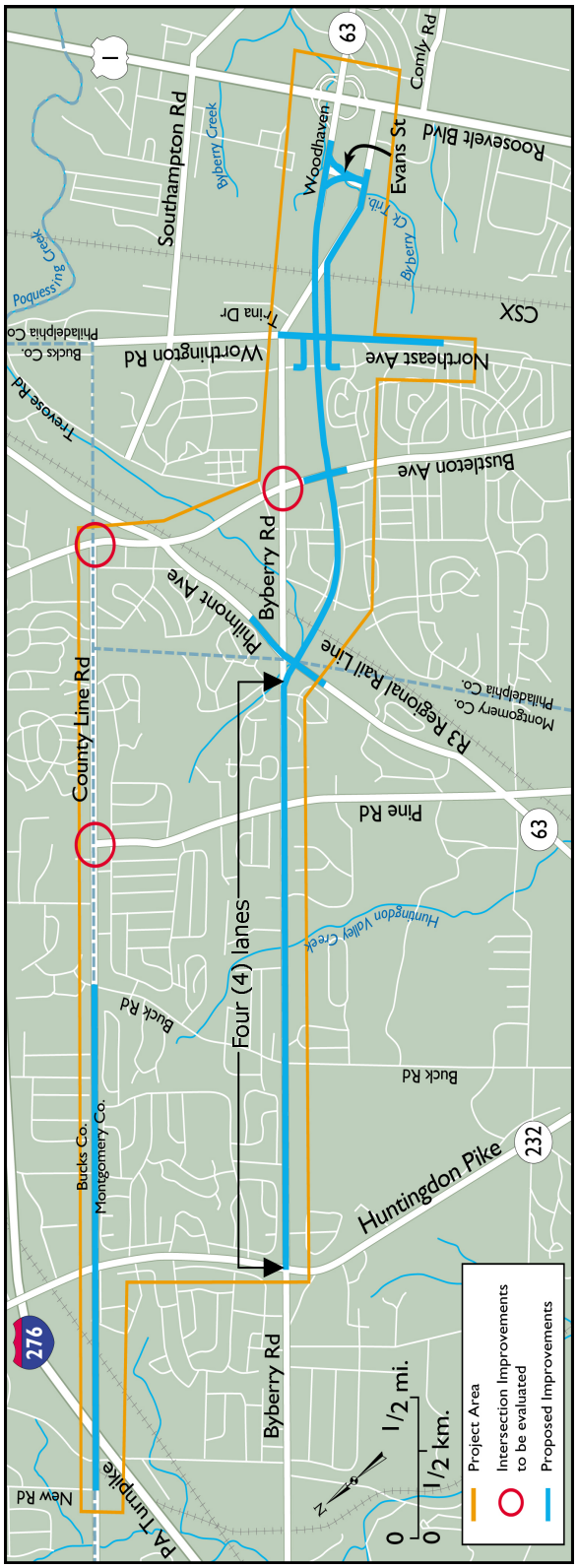


Figure III-3: Woodhaven Extension Alternative

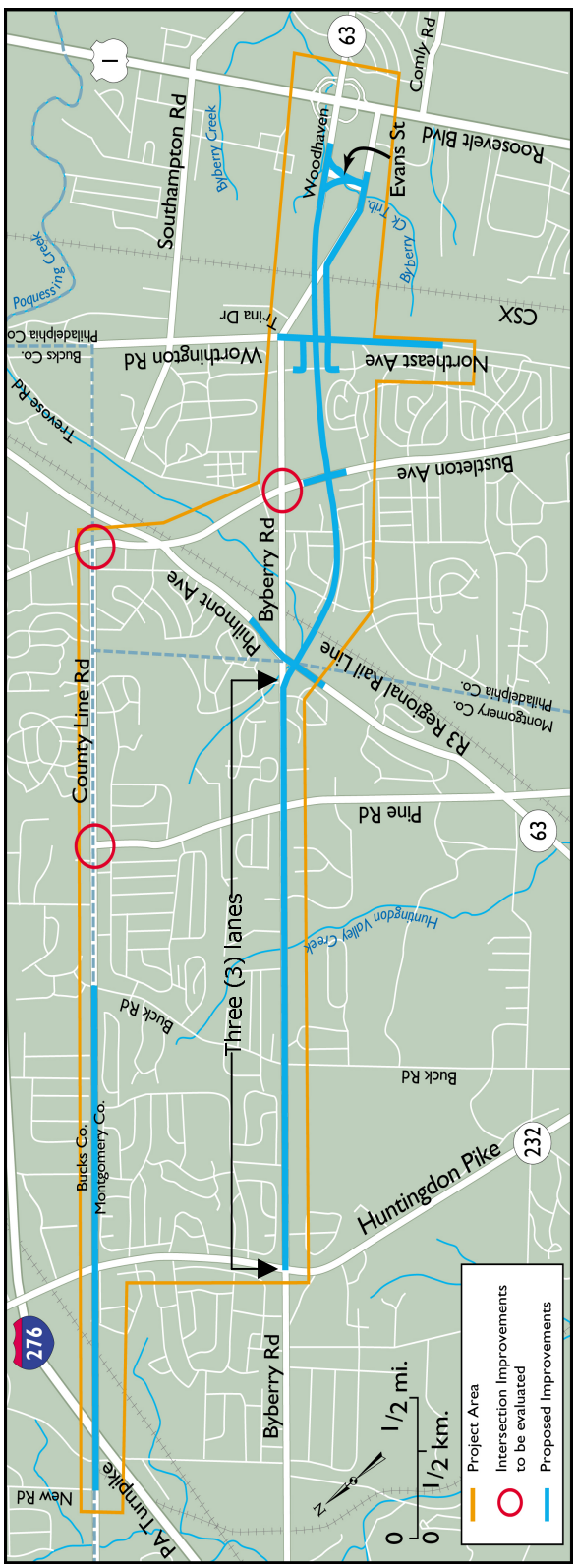


Figure III-4: Modified Woodhaven Extension Alternative

5. Bustleton Avenue Alternative

This alternative extends the Woodhaven Expressway westward from its current terminus at Evans Street with two westbound lanes. The left westbound lane will continue to an intersection/interchange with Bustleton Avenue, and the right lane will exit onto Byberry Road. There will be two eastbound travel lanes on the expressway extension. A ramp will be provided from Bustleton Avenue to Northeast Avenue/Worthington Road for local traffic. An eastbound on-ramp to the Woodhaven Expressway at Evans Street will be provided. This is intended to create connections to improve traffic flow in the study area.

Improvements at intersections along Byberry Road from Worthington Road to Huntington Pike, including widening and the addition of auxiliary lanes, will be evaluated. To accommodate the new traffic patterns and future traffic growth, Bustleton Avenue will be evaluated for capacity improvements from the newly created intersection with the extension to County Line Road. County Line Road will be widened to four lanes from Buck Road to just west of New Road and improvements at intersections on County Line Road from Bustleton Avenue to New Road will be evaluated. *Figure III-5* displays the locations of the proposed improvements.

6. Modified Bustleton Avenue Alternative

This alternative extends the Woodhaven Expressway westward from its present terminus, and includes an eastbound off-ramp and an eastbound on-ramp at Evans Street. The extension will span the existing CSX tracks and continue as a four-lane highway to an interchange at Bustleton Avenue with a westbound off-ramp and an eastbound on-ramp. West of Bustleton Avenue, the expressway narrows to a two-lane roadway, ending just west of Philmont Avenue.

Bustleton Avenue will be evaluated for capacity improvements from the newly created intersection with the extension to County Line Road. Improvements along Byberry Road from Worthington Road to Huntingdon Pike, such as widening and the addition of auxiliary lanes, will be evaluated. To accommodate new traffic patterns and future traffic growth, Bustleton Avenue may require localized intersection improvements and improved signal timing coordination from Byberry Road to County Line Road. County Line Road will be widened to four lanes from Buck Road to just West of New Road and improvements at all the intersections on County Line Road from Bustleton Avenue to New Road will be evaluated. *Figure III-6* displays the locations of the proposed improvements.

Figure III-5: Bustleton Avenue Alternative

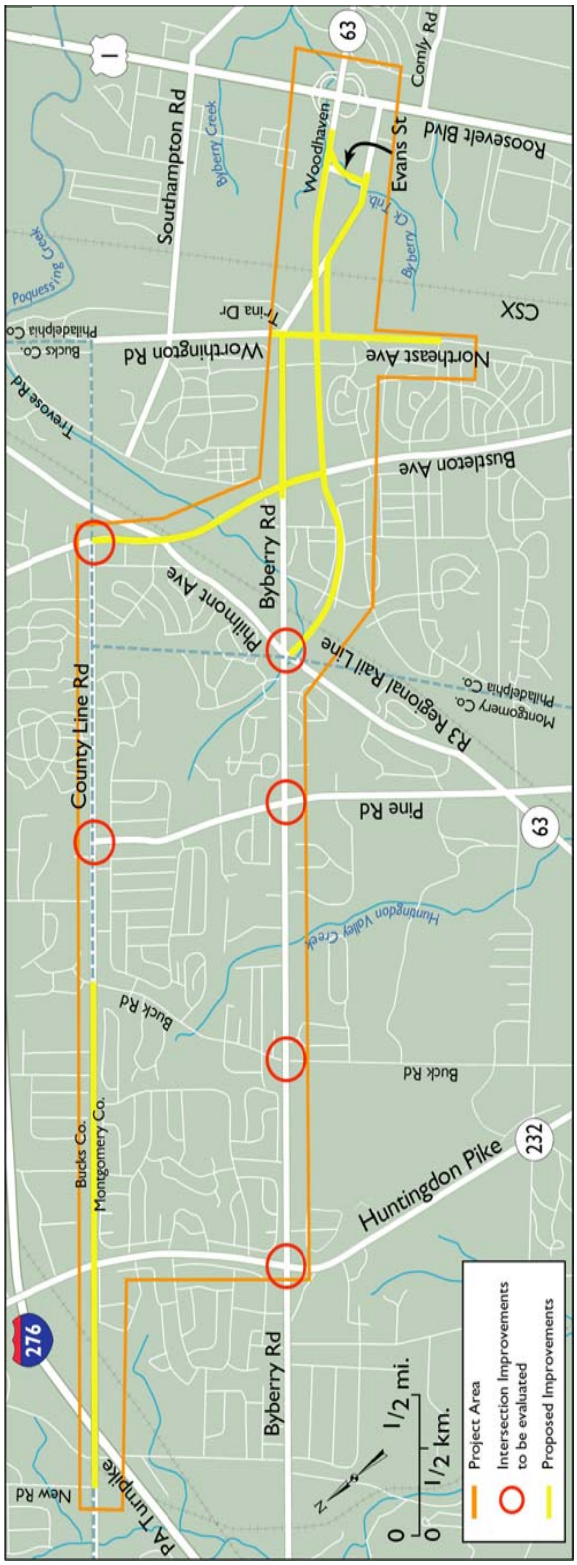


Figure III-6: Modified Bustleton Avenue Alternative

B. Previous Improvement Alternatives

All of the following improvement alternatives, except the Multi-option, were studied previously in 1996 for a design year of 2015. Subsequently, the design year was extended to 2026 and all the alternatives were re-modeled including the multi-option in 2001 by DVRPC.

1. No Build

This alternative was modeled as a true no build assuming that no improvements would be constructed in the next 20 years. This alternative does include the replacement of the bridge over the CSX railway tracks on Byberry Road east of Worthington Road. It can also be assumed that traffic signal timing improvements would be made over the next 20 years.

2. Original Byberry Road Upgrade Alternative

This alternative would extend the expressway from its current terminus to a connection with Byberry Road just west of Worthington Road. Byberry Road would be widened to five lanes from this point to Philmont Avenue. The connection with Evans Road would be severed.

3. Extended Byberry Road Upgrade Alternative

This alternative would extend the expressway from its current terminus to a connection with Byberry Road just west of Worthington Road. Byberry Road would be widened to five lanes from this point to Philmont Avenue and continue as a four lane widening to Buck Road. The connection with Evans Road would be severed. *(The intersection of Byberry and Bustleton may need to be grade separated, but was modeled as an at grade intersection.)*

4. Original Woodhaven Extension Alternative

This alternative would provide a four-lane extension of the Woodhaven Expressway from its present terminus into a grade separated interchange with Bustleton Avenue (EB on and WB off only), and continuing as a two-lane roadway through an at-grade intersection with Philmont Avenue before tying back into Byberry Road. There would be an eastbound off ramp and an eastbound on-ramp at Evans Street.

5. Extended Woodhaven Extension Alternative

This Alternative would provide a four lane extension of the Woodhaven Expressway from its present terminus into a grade separated full interchange with Bustleton Avenue, continuing as a four-lane highway through a grade separated interchange with Philmont avenue, and tying back into Byberry Road which would be widened to four lanes to Buck Road. There would be an eastbound off-ramp and an eastbound on-ramp at Evans Street

6. Multi-Option Alternative

This alternative would extend the expressway from its current terminus to an at-grade intersection with Bustleton Avenue. This extension would begin with two westbound lanes but one would be dropped as an exit to Byberry Road/northbound Bustleton. Byberry Road was modeled as a two lane roadway. There would be two eastbound travel lanes on the expressway

extension with an eastbound off-ramp at Northeast Avenue and an eastbound on-ramp at Evans Street.

IV. TRAVEL FORECASTING PROCEDURES

A. Socioeconomic Projections

DVRPC's long-range population and employment forecasts are revised periodically to reflect changing market trends, development patterns, local and national economic conditions, and available data. The completed forecasts reflect all reasonably known current information and the best professional judgment of predicted future conditions. The revised forecasts adopted by the DVRPC Board on February 24, 2000 reflect an update to municipal forecasts that were last completed in June 1993.

DVRPC uses a multi-step, multi-source methodology to produce its population and employment forecasts at the county-level. County forecasts serve as control totals for municipal forecasts, which are disaggregated from county totals. Municipal forecasts are based on an analysis of historical data trends adjusted to account for infrastructure availability, environmental constraints to development, local zoning policy, and development proposals. Municipal population forecasts are constrained using density ceilings and floors. County, and where necessary, municipal input is used throughout the process to derive the most likely population forecasts for all geographic levels.

1. Population Forecasting

Population forecasting at the regional level involves review and analysis of six major components: births, deaths, domestic in-migration, domestic out-migration, international immigration, and changes in group quarters populations (e.g. dormitories, military barracks, prisons, and nursing homes). DVRPC uses both the cohort survival concept to age individuals from one age group to the next, and a modified Markov transition probability model based on the most recent US Census and the US Census' recent Current Population Survey (CPS) research to determine the flow of individuals between the Delaware Valley and the outside world. For movement within the region, Census and IRS migration data coupled with CPS data are used to determine migration rates between counties. DVRPC relies on county planning offices to provide information on any known, expected, or forecasted changes in group quarters populations. These major population components are then aggregated and the resulting population forecasts are reviewed by member counties for final adjustments based on local knowledge.

2. Employment Forecasting

Employment is influenced by local, national, and global political and socio-economic factors. The Bureau of Economic Analysis provides the most complete and consistent time series data on county employment by sector, and serves as DVRPC's primary data source for employment forecasting. Employment sectors include mining, agriculture, construction, manufacturing, transportation, wholesale, retail, finance/insurance, service, government, and military. Other supplemental sources of data include the U.S. Census, Dun & Bradstreet, Bureau of Labor Statistics, Occupational Privilege tax data, and

other public and private sector forecasts. The OBERS shift-share model in combination with the Woods and Poole Economics' sectoral forecasts provides the basis for DVRPC's employment forecasts. As in the population forecasts, county level total employment is used as a control total for sector distribution and municipal level forecasts. Forecasts are then reviewed by member counties for final adjustments based on local knowledge.

3. Woodhaven Road Study Area Population and Employment Forecasts

DVRPC's long-range population and employment forecasts to year 2025 were developed prior to the release of the 2000 Census. At the time the Woodhaven Road traffic study was initiated, 2000 municipal-level Census population data was available. 2000 Census employment data is scheduled for release in 2003.

As part of the Woodhaven Road traffic study, DVRPC staff reviewed its most recent current population and employment estimates (1997), its 2025 long-range population and employment forecasts, and all proposed land-use developments in the study area.. Based on this review, DVRPC revised 2025 municipal-level population and employment forecasts for use as inputs to the traffic simulation models.

Table IV-1 summarizes the population and employment forecasts used in the Woodhaven Road Traffic Study.

B. Travel Forecasting Methods

DVRPC's traffic simulation models were used in conjunction with the 2025 population and employment forecasts to develop 2025 traffic volumes and patterns. Traffic forecasts for 2026 were based on an extrapolation of current and 2025 traffic patterns.

Projection of travel demand for the Woodhaven Road Alternatives was accomplished in two phases. First a 2025 projection of roadway traffic volumes was made based on the DVRPC board adopted 2025 socioeconomic forecast and the facility improvements included in the transportation alternative under study. In a second step, 2006 link volumes requirements were estimated by interpolating between current estimates and 2026 forecasts prepared by extrapolating from 2025.

Table IV-1. Population and Employment Forecasts for the Woodhaven Road Study Area

	Population					Employment			
				Change				Change	
	DVRPC	Census	DVRPC	2000 - 2025		DVRPC	DVRPC	1997 - 2025	
Municipality	**1997**	**2000**	**2025**	**Diff**	**% Diff**	**1997**	**2025**	**Diff**	**% Diff**
Bensalem Township	57,162	58,434	60,739	3,577	6.3%	35,722	42,590	6,868	19.2%
Bryn Athyn Borough	1,082	1,351	1,150	68	6.3%	764	800	36	4.7%
CPA 12 (Philadelphia Far Northeast)	156,004	158,173	159,998	3,994	2.6%	58,461	66,949	8,488	14.5%
Lower Moreland Township	11,778	11,281	11,000	-778	-6.6%	6,803	6,399	-404	-5.9%
Lower Southampton Township	19,873	19,276	22,170	2,297	11.6%	10,129	11,400	1,271	12.5%
Upper Moreland Township	24,445	24,933	24,000	-445	-1.8%	17,099	17,502	403	2.4%
Upper Southampton Township	16,708	15,764	20,600	3,892	23.3%	10,483	16,800	6,317	60.3%
Study Area Total	**287,052**	**289,212**	**299,657**	**12,605**	**4.4%**	**139,461**	**162,440**	**22,979**	**16.5%**

1. Focused Simulation Process

The regional travel assignments do not give the detailed forecasts of AM and PM peak hour link volumes and turns required for corridor level design studies. In addition, local streets not included in the regional highway network are often of great interest to local planners and engineers. In order to improve the forecasting levels provided and to accommodate these special needs, an enhanced assignment technique focused on a detailed study area is used to produce corridor level highway and transit forecasts. This focused simulation process allows the use of DVRPC regional simulation models and increases the accuracy and detail of the travel forecasts within the detailed study area. At the same time, all existing and proposed highways throughout the region and their impact on both regional and interregional travel patterns become an integral part of the simulation process.

A focused approach was used to estimate traffic volumes based on the highway service levels provided by the Woodhaven Road alternatives. The focused simulation process involved adding missing local streets to the network. Simulation zones inside the study area were subdivided so that traffic from existing and proposed land use developments could be loaded directly onto the network.

2. Traffic Assignment Validation and Future Trip Table Preparation

The final step in the preparation of the focused simulation process is the validation of the simulated highway assignment outputs using current traffic counts taken on roadways serving the study area. The focused simulation model was executed with inputs reflective of 1997 conditions and the results compared with recent traffic counts collected by DVRPC. Based on this analysis, the focused model produced reasonable daily traffic volumes.

To establish the current travel demand for the area under influence of the proposed roadway access improvements, DVRPC gathered information from a traffic counting effort conducted by field personnel. Automatic Traffic Recorder equipment was set at selected locations. These traffic counts were then tabulated on a peak period and daily basis and factored to represent annual average daily traffic (AADT). These daily traffic counts form the basis for the validation of the travel simulation model. In addition, the peak hour distributions of traffic at the count locations provide guidance for the estimation of AM and PM peak hour traffic forecasts under the No-Widening and improvement alternatives.

For this study, the focused 2025 trip table was prepared by disaggregating the socio-economic inputs to the DVRPC trip generation model and surcharging these data to reflect the additional industrial, commercial, and residential development in the area not included in the DVRPC Board adopted 2025 forecast. Following this, the DVRPC model from trip generation through traffic assignment was executed for each of the improvement

alternatives. The resulting travel matrix includes all travel patterns throughout the Delaware Valley Region. Travel to and from all parts of Bucks, Chester, Delaware, and Montgomery counties, Philadelphia, and New Jersey via the Delaware River bridges is included as are trips to/from the remainder of Pennsylvania and the state of Delaware.

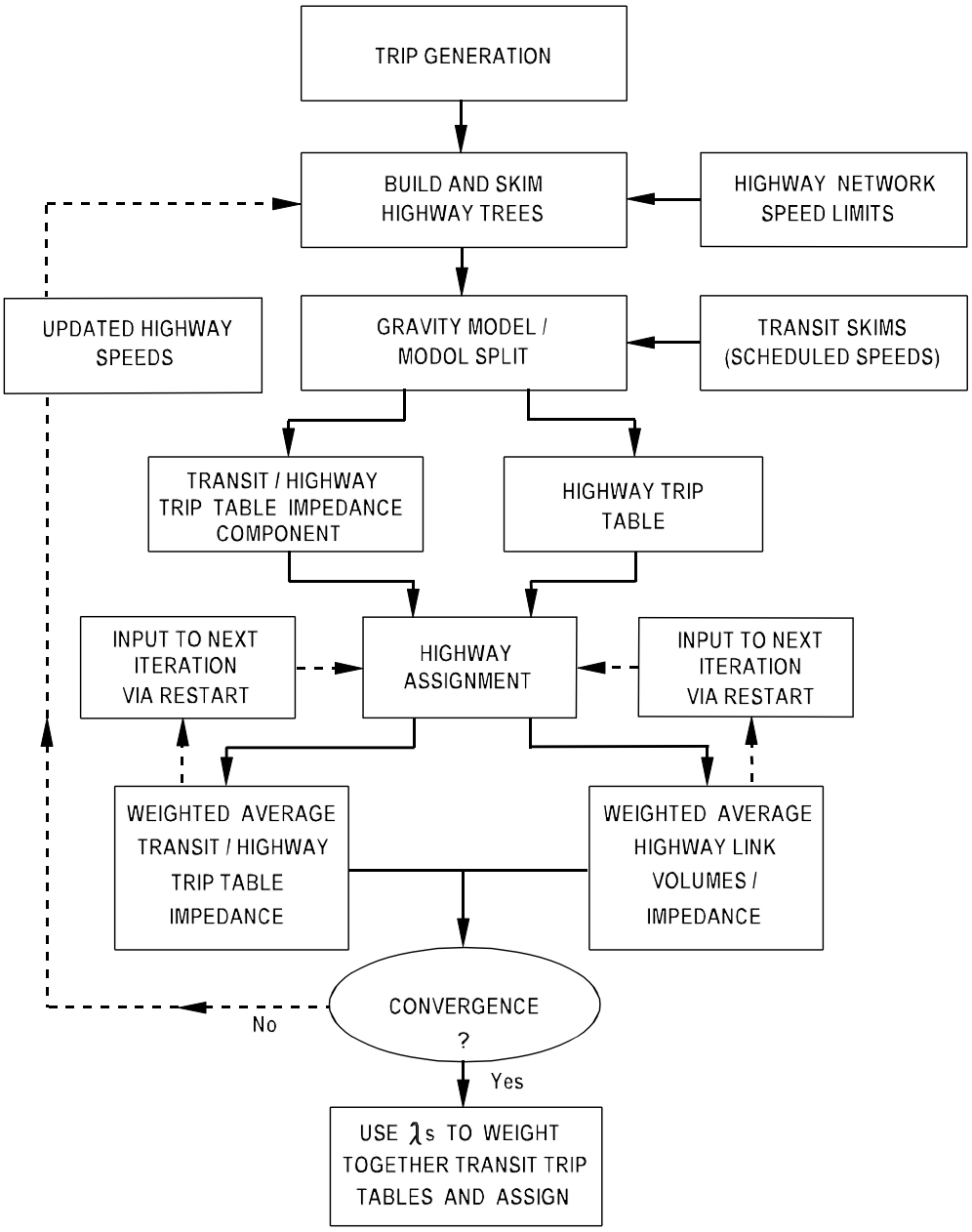
C. Synopsis of the Enhanced DVRPC Travel Simulation Process

The enhanced DVRPC travel simulation process utilizes the Evans Algorithm to iterate the model. The Evans Algorithm re-executes the trip distribution and modal split models based on updated highway speeds after each iteration of highway assignment and assigns a weight (λ) to each iteration. This weight is then used to prepare a convex combination of the link volumes and trip tables for the current iteration and a running weighted average of the previous iterations. This algorithm converges rapidly to the equilibrium solution on highway travel speeds and congestion levels. About seven iterations are needed for the process to converge to the approximate equilibrium state for travel patterns. After equilibrium is achieved, the weighted average transit trip tables are assigned to the transit networks to produce link and route passenger volumes. The final step of this iterative simulation process is the assignment of vehicle trips to the highway network.

DVRPC's enhanced travel simulation model is disaggregated into separate peak period, midday, and evening time periods. This disaggregation begins in trip generation where factors are used to separate daily trips into peak and midday travel. Evening travel is then defined as the residual after peak and midday travel are removed from daily travel. The enhanced process utilizes completely separate model chains for peak, midday, and evening travel simulation runs. The peak period (combined AM and PM) is defined as 7:00 AM to 9:00 AM and 3:00 PM to 6:00 PM, midday is defined as 9:00 AM to 3:00 PM and evening as 6:00 Pm to7:00 AM. The separation of the models into three time periods was accomplished with few changes to the basic models or their parameters is required. Inputs sensitive to time of day such as highway capacities and transit service levels were disaggregated to be reflective of time-period specific conditions.

The enhanced iterative DVRPC model is charted in Figure IV-1. The first step in the process involves generating the number of trips that are produced by and destined for each traffic zone and cordon station throughout the nine-county region.

Figure IV-1: Evans Implementation Using DVRPCís Regional Simulation Model



1. Trip Generation

Both internal trips (those made within the DVRPC region) and external trips (those which cross the boundary of the region) must be considered in the simulation of regional travel. Internal trip generation is based on zonal forecasts of population and employment, whereas external trips are estimated from cordon line traffic counts. The latter also include trips which pass through the Delaware Valley region. Estimates of internal trip productions and attractions by zone are established on the basis of trip rates applied to the zonal estimates of demographic and employment data. This part of the DVRPC model is not iterated on highway travel speed. Rather, estimates of daily trip making by traffic zone are calculated and then disaggregated into peak, midday, and evening time periods.

2. Evans Iteration

The iterative portion of the Evans Algorithm involves updating the highway network restrained link travel speeds, rebuilding the minimum time paths through the network, and skimming the inter-zonal travel time for the minimum paths. Then the trip distribution, modal split, and highway assignment models are executed in sequence for each pass through the model chain (see Figure IV-1). After convergence is reached, the transit trip tables for each iteration are weighted together and the weighted average table assigned to the transit network. The highway trip tables are loaded onto the network during each Evans iteration. A composite highway trip table is not required to perform the highway assignment - rather the highway link volumes from the assignment are weighted together directly. Seven iterations of the Evans process, for each time period, are performed to ensure that convergence on travel times is reached.

3. Trip Distribution

Trip distribution is the process whereby the zonal trip ends established in the trip generation analysis are linked together to form origin-destination patterns in the trip table format. Peak, midday, and evening trip ends are distributed separately. For each Evans iteration, a series of seven gravity type distribution models are applied at the zonal level for each time period. These models follow the trip purpose and vehicle type stratifications established in trip generation. Documentation of the trip distribution models is included in the commission report entitled, "1997 Travel Simulation Model for the Delaware Valley Region."

4. Modal Split

The modal split model is also run separately for the peak, midday and evening time periods. The modal split model calculates the fraction of each person_trip interchange in the trip table which should be allocated to transit, and then assigns the residual to highway. The choice between highway and transit usage is made on the basis of comparative cost, travel time, and frequency of service, with other aspects of modal choice being used to modify this basic relationship. In general, the better the transit service, the higher the

fraction assigned to transit, although trip purpose and auto ownership also affect the allocation. The model subdivides highway trips into auto drivers and passengers. Auto driver trips are added to the truck, taxi, and external vehicle trips in preparation for assignment to the highway network. See "1990 Travel Simulation Model for the Delaware Valley Region" for a detailed description of the model parameters.

5. Highway Assignment

The final step in the iterative simulation process is the assignment of vehicle trips to the highway network. For peak, midday, and evening travel, this assignment model produces the future traffic volumes for individual highway links that are required for planning analyses. The highway network and trip table underlying the assignment is regional in nature. This allows the diversion of highway vehicular travel into and through the study area to various points of entry and exit in response to the characteristics of the transportation system.

For each Evans iteration, highway trips are assigned to the network by determining the best (minimum time) route through the highway network for each zonal interchange and then allocating the interzonal highway travel to the highway facilities along that route. This assignment model is “capacity restrained” in that congestion levels are considered when determining the best route. The Evans equilibrium assignment method is used to implement the capacity restraint. When the assignment and associated trip table reach equilibrium, no path faster than the one actually assigned can be found through the network, given the capacity restrained travel times on each link.

Initial estimates of future year intersection turning volumes were determined by scaling current year turning volumes according to growth factors on each intersection leg. These growth factors are the ratio of future year peak hour link volumes to current peak hour volumes. The future year peak hour link volumes for each leg of the intersection were determined by multiplying the forecasted AADT, an output of the DVRPC traffic assignment, by AM and PM “K” factors. Existing “K” factors were calculated from traffic counts as the ratio of the highest morning and evening hourly volumes to the total AADT. Future year “K” factors were based on the existing “K” factors and the AADT growth on each intersection approach. The resulting forecasted turning volumes for the AM and PM peak hours were reviewed for reasonableness and adjusted as necessary to balance traffic flows between adjacent intersections.

V. HIGHWAY TRAFFIC FORECASTS

Forecasted design year (2026) average daily traffic volumes for selected highway links within the corridor are presented and analyzed in this part of the report. The first part of this section discusses the forecasted traffic for each alternative independently, while the second part details the differences among the alternatives.

1. No-Build Alternative

Figure V-1 compares existing traffic volumes with future no-build traffic forecasts. While the forecasts indicate growth ranges from less than 10% to more than 90%, most of the major east- west roads are expected to see growth in the 15% to 30% range. East of Bustleton Avenue, Byberry Road traffic volumes are forecasted to increase by about 5,000 vpd or 30%, County Line Road volumes are forecasted to increase by about 7,000 vpd (more than 30%), and Street Road volumes are forecasted to increase about 6,000 vpd or 20%. Traffic growth exiting the study area on the Roosevelt Blvd. and the Woodhaven Expressway is also expected to increase by about 5,000 to 7,000 vpd. Generally, the major roadways/highways experience only slightly higher absolute growth than the lesser arterial east/west routes, indicating that growth in the west and northwest part of the study area is filtering through multiple routes to access the main highways and thoroughfares in the eastern part of the study area due to the lack of a easy access route to these highways.

2. Byberry Road Upgrade Alternative

Figure V-2 compares the no-build traffic forecasts with traffic forecasts for the Byberry Road Upgrade Alternative. South of Byberry Road traffic forecasts remain virtually the same indicating traffic patterns and volumes are not expected to change as a result of the improvements. North of Byberry Road the traffic forecasts present a much different picture as traffic increases significantly on County Line Road, Buck Road, Pine Road and Bustleton Avenue. While traffic forecasts decrease slightly on Street Road, the value is not offset by the increases indicating new trips are generated from the area around Byberry Road or to the north and west of the study area. Most of the new trips are concentrated on the upgraded Byberry Road or County Line Road where there is additional capacity to accommodate the increases. By percentages, traffic is expected to increase by about 10 to 20% on County Line Road and by nearly 30% on Byberry Road as a result of the improvements.

3. Woodhaven Extension Alternative

Figure V-3 compares the no-build traffic forecasts with traffic forecasts for the Woodhaven Extension Alternative. South of Byberry Road and the extension traffic forecasts are close to no-build forecasts except south of Tomlinson on

Bustleton Avenue and Red Lion Road east of Bustleton Avenue. On the two links, daily traffic is forecasted to decrease by 3,000 to 4,000 vpd indicating the new expressway becomes a more attractive route to access the Boulevard and other roads south of the study area. Again there are significant increases in traffic north of Byberry Road on County Line Road, Buck Road and Pine Road. However, this alternative appears to be more desirable than the Byberry Road Upgrade Alternative to County Line Road traffic since there is a much larger volume increase in this alternative on Pine and Buck Roads.

4. Modified Woodhaven Extension Alternative

Figure V-4 compares the no-build traffic forecasts with traffic forecasts for the Modified Woodhaven Extension Alternative. Traffic forecasts throughout the network are very close to the non-modified Woodhaven Extension Alternative. The only noticeable difference is west of Bustleton Avenue on the extension and Byberry Road where the forecasts are lower by 3,000 to 5,000 vpd.

As a result of the improvements, County Line Road traffic is forecasted to increase by about 10% more than the no-build up to Pine Road. Pine Road and South Buck Road are expected to see large percent (>30%) increases as traffic flows between County Line Road and the Woodhaven Extension. Byberry Road traffic forecast, west of the tie-in with the extensions, indicates an increase of 30% or more compared to the no-build. East of the tie-in traffic is forecasted to drop by 25 to 50% on Byberry Road.

5. Bustleton Avenue Alternative

Figure V-5 compares the no-build traffic forecasts with traffic forecasts for the Bustleton Avenue Alternative. Similar to the Woodhaven Extension Alternative, traffic forecasts in the southern area are close to the no-build forecast except south of Tomlinson on Bustleton Avenue and Red Lion Road east of Bustleton Avenue. On these two links, daily traffic is forecasted to decrease by 3,000 to 4,000 vpd indicating the new roadway becomes a more attractive route to access the Boulevard and other roads south and east of the study area.

Also similar to the other alternatives, north of Byberry Road the traffic forecasts increases significantly on County Line Road, Buck Road, Pine Road and Bustleton Avenue. The main difference between this alternative and the three previous alternatives is that the forecasted increases in traffic volumes are significantly less on Byberry Road, Pine Road and South Buck Road since the extension ends at Bustleton Avenue. Traffic forecasts on Bustleton Avenue are slightly higher (~1-2k) for this alternative compared to either Woodhaven Alternative, but the increase is significantly less than the decrease on the previously mentioned roads.

6. Modified Bustleton Avenue Alternative

Figure V-6 compares the no-build traffic forecasts with traffic forecasts for the Modified Bustleton Avenue Alternative. This alternative is similar to both the Bustleton Avenue Alternative and the Woodhaven Extension Alternative. In this alternative, the extension is four lanes to Bustleton Avenue and then two lanes to the connection with Byberry Road.

When compared to the Bustleton Avenue Alternative, the most notable difference is the volume at the intersection of Bustleton Avenue and Byberry Road. At this location, traffic north of the intersection is about the same. However, daily traffic south, east, and west drops significantly as the additional roadway provides a more desirable east-west route.

When compare to the Modified Woodhaven Alternative, traffic forecasts are about 15% lower on Byberry Road west of the tie-in point (26,500 vs. 30,700). A more significant decrease is forecasted for the roadway section of the Woodhaven Extension between Byberry Road and Bustleton Avenue. As a result of the decrease in the number of lanes, traffic forecasts a near 30% decrease (32,500 to 23,400).

7. Alternative Comparisons

Figure V-7 compares the current traffic volumes (2002) with the No-Build (2026) and Byberry Road Upgrade Alternative (2026). In the figure, current volumes are shown in black, underneath the lines representing the highway links. The No-Build volumes are shown above the line in red, and the Byberry Road Upgrade volumes are shown directly above the No-Build volumes in green.

Under current conditions, Byberry Road traffic volumes range from 15,600 vehicles per day (vpd) in the western end of the study area to 32,000 vpd across the CSX railroad tracks in the east. Traffic on Byberry Road, as well as most other roads, increases as you move towards the east. In the future, traffic along Byberry Road shows both large volume and percentage increases with high volume increases occurring west of Bustleton Avenue. In this section, Byberry Road has more capacity for additional traffic than east of Bustleton Avenue where traffic is currently near capacity conditions for the peak hours of the day.

Partially as a result of the lack of capacity on Byberry Road, other east-west roads including Southampton Road and Red Lion Road must carry additional traffic that might otherwise use Byberry Road. This becomes evident when the future No-Build volumes are compared to the Byberry Road Upgrade volumes just west of Route 1 (Roosevelt Blvd.). At this point, traffic volumes for the alternate east-west roads in the Byberry Road Upgrade are actually less than the No-Build alternative (50.3 vs. 51.7, 15.1 vs. 16.7, and 37.2 vs. 37.8), as traffic has shifted to the improved section of Byberry Road.

Another key observation when comparing the No-Build and the Byberry Road Upgrade is the increase in traffic volumes at the Woodhaven Expressway, just east of Route 1. At this location, the volume is expected to increase from 64,500 vpd to 71,900 vpd. Based on a comparison of the roads around this point, the conclusion is that the improvements on Byberry Road are either creating new trips or causing a shift in mode of travel. *Table V-1* compares the growth rates for links throughout the study area for the No-Build and Byberry Road Upgrade alternatives

Figure V-8 compares the Byberry Road Upgrade (2026) traffic volumes with the Woodhaven Extension (2026) and Bustleton Avenue (2026) alternatives. In the figure, the Byberry Road Upgrade volumes are shown in green, underneath the lines representing the highway links. The Woodhaven Extension volumes are shown above the line in purple, and the Bustleton Avenue volumes are shown directly above the Woodhaven Extension volumes in light blue.

The figure provides an excellent picture of the different effects the alternatives will have on traffic volumes throughout the study area. The main observation is that volumes for both the Woodhaven Extension and Bustleton Avenue alternatives tend to be increasing around the expressway and drawing traffic from parallel east-west routes. For example, Red Lion Road is expected to increase from 33,200 to 37,800 by 2026 with the no-build alternative. In the Byberry Road upgrade, the traffic volume decreases to 37,200. In both the Woodhaven Extension and Bustleton Avenue the traffic volume drops below 34,000, a clear indication that traffic is being drawn to the improved facility since this is a more attractive route than Red Lion Road. Table V-2 compares the growth rates for links throughout the study area for the No-Build, the Byberry Road Upgrade, the Woodhaven Extension and Bustleton Avenue alternatives.

Lastly, *Table V-1* provides a comparison of key locations throughout the study area for the No-Build and all the alternatives. The first location is Woodhaven Road between Thorton and US 1. The table clearly shows a significant increase in traffic on the expressway as a result of any improvement. The next two locations (Southampton Road and Red Lion Road) are parallel east-west routes. The traffic volumes demonstrate the different level of effectiveness of each alternative compared to the no-build. For example, as previously mentioned, traffic on Red Lion Road would drop slightly as compared to the no-build as a result of the Byberry Road Upgrade (37,780 to 37,155). However, the other four alternatives have a much more pronounced effect on Red Lion Road. In fact, traffic is expected to drop from current levels (33,200) as a result of the Woodhaven Extension (33,084). This type of pattern is not seen on Street Road, as traffic does not significantly drop as a result of the improvements, indicating the improvements mostly benefit the study area traffic and do not significantly draw new trips from out of the study area.

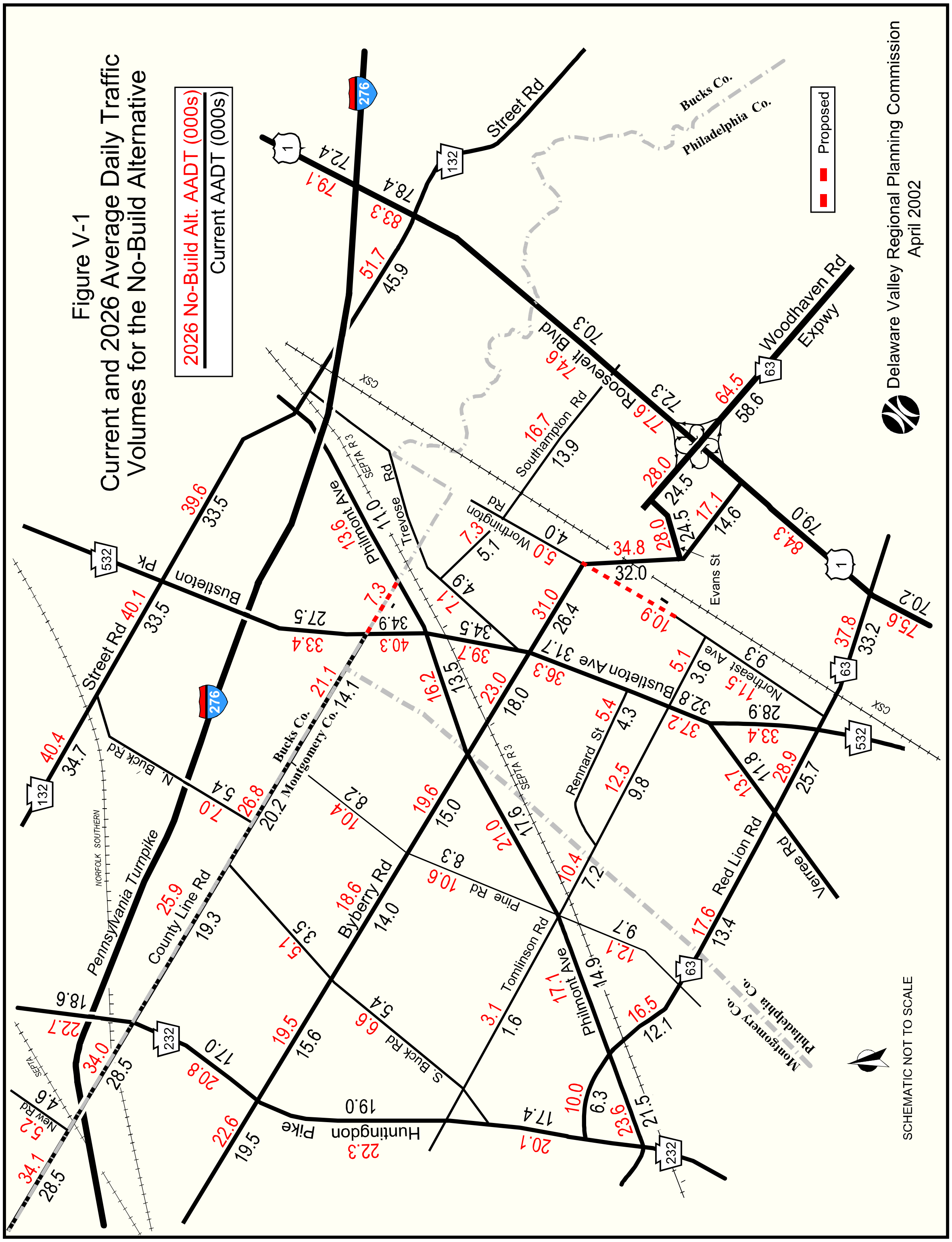


Figure V-1
Current and 2026 Average Daily Traffic Volumes for the No-Build Alternative

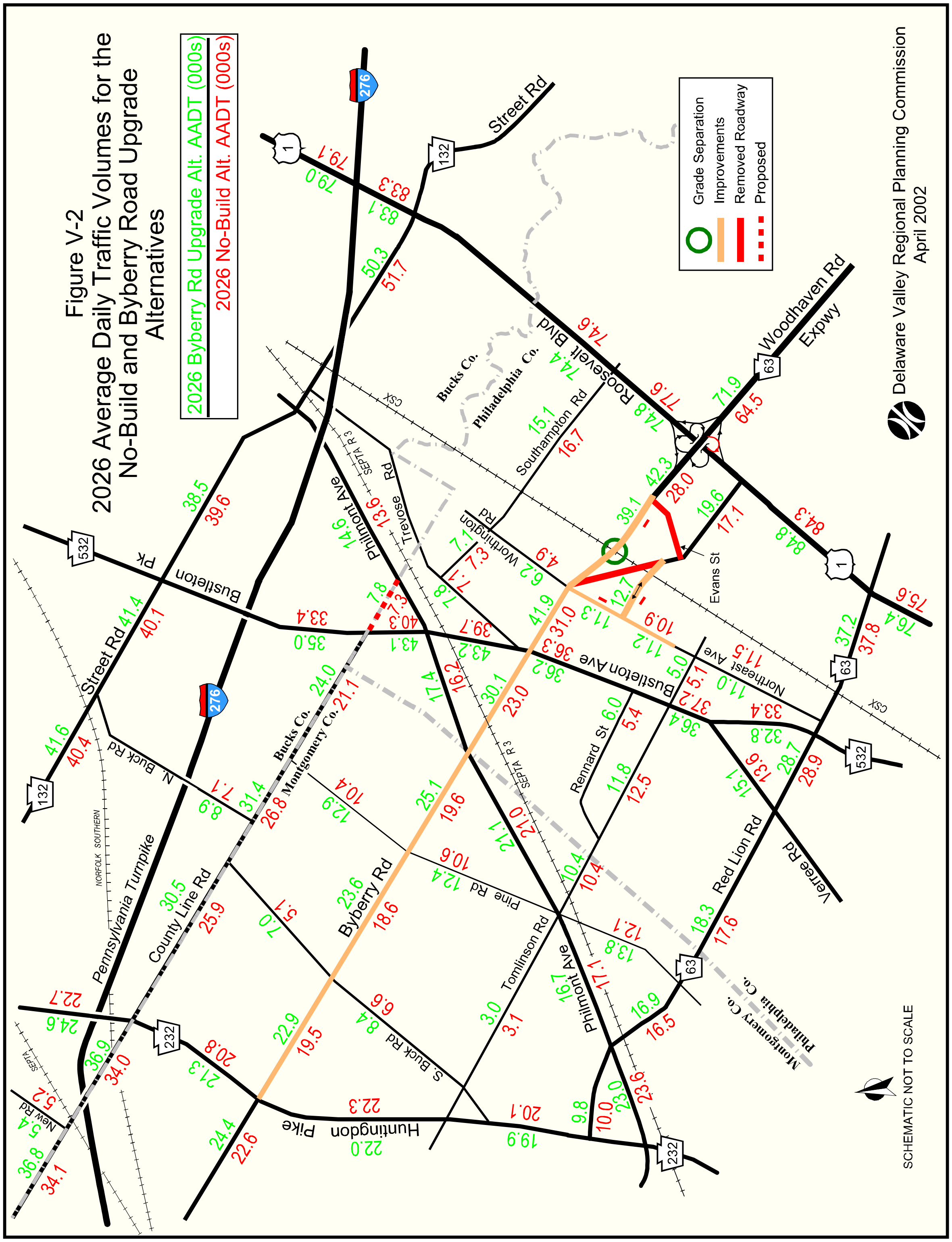


Figure V-2
2026 Average Daily Traffic Volumes for the
No-Build and Byberry Road Upgrade
Alternatives
2026 Byberry Rd Upgrade Alt. AADT (000s)
2026 No-Build Alt. AADT (000s)
Grade Separation
Improvements
Removed Roadway
Proposed
Woodhaven Rd
Expwy
Roosevelt Blvd
Street Rd
Southampton Rd
Worthington Rd
Evans St
Bustleton Ave
Bustleton Pk
Northeast Ave
Red Lion Rd
Verree Rd
Byberry Rd
Philmont Ave
Trevose Rd
Rennard St
Pine Rd
Tomlinson Rd
S. Buck Rd
N. Buck Rd
County Line Rd
Pennsylvania Turnpike
Huntingdon Pike
New Rd
Bucks Co.
Philadelphia Co.
Montgomery Co.
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE

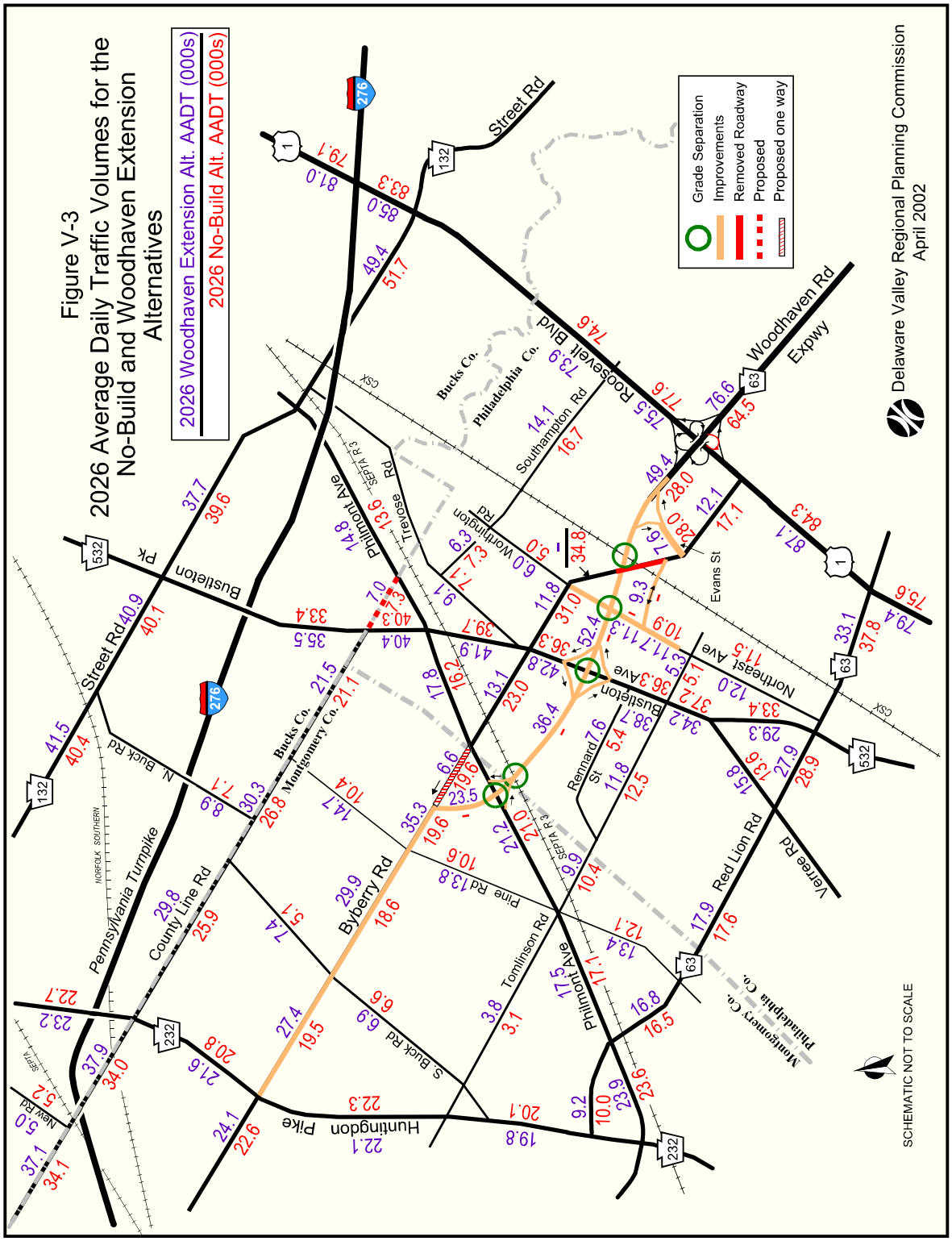


Figure V-3
2026 Average Daily Traffic Volumes for the No-Build and Woodhaven Extension Alternatives
2026 Woodhaven Extension Alt. AADT (000s)
2026 No-Build Alt. AADT (000s)
Grade Separation
Improvements
Removed Roadway
Proposed
Proposed one way
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE
Woodhaven Rd
Expwy
Street Rd
Bustleton Pk
Bustleton Ave
Roosevelt Blvd
Philmont Ave
Southampton Rd
Evans St
Northeast Ave
Rennard St
Red Lion Rd
Verree Rd
Tomlinson Rd
Byberry Rd
Pine Rd
Huntingdon Pike
S. Buck Rd
N. Buck Rd
County Line Rd
Pennsylvania Turnpike
Bucks Co.
Montgomery Co.
Philadelphia Co.
Montgomery Co.
CSX
SEPTA R3
SEPTA
NORFOLK SOUTHERN
New Rd

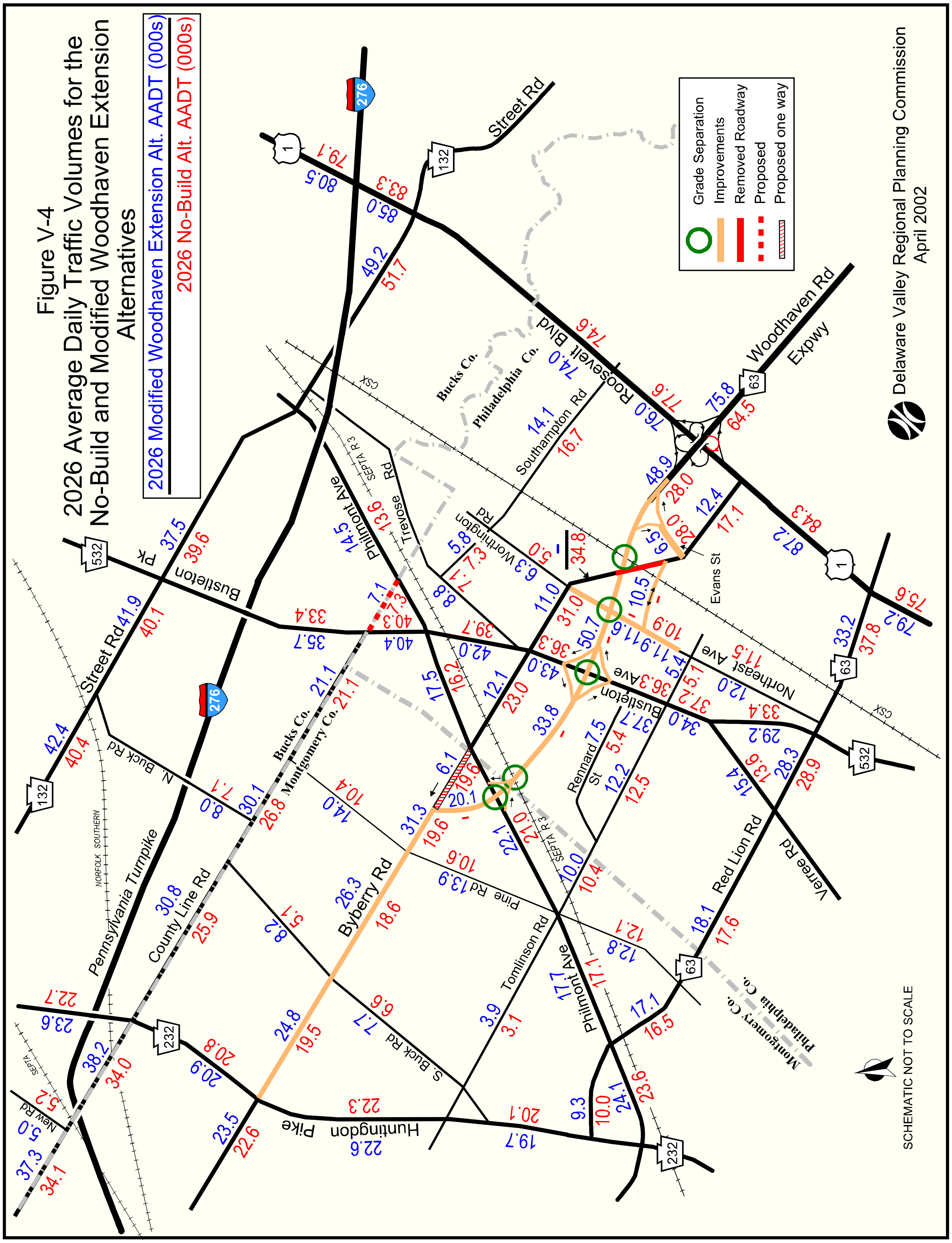


Figure V-4
2026 Average Daily Traffic Volumes for the No-Build and Modified Woodhaven Extension Alternatives
2026 Modified Woodhaven Extension Alt. AADT (000s)
2026 No-Build Alt. AADT (000s)
Grade Separation
Improvements
Removed Roadway
Proposed
Proposed one way
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE
Woodhaven Rd
Expwy
Roosevelt Blvd
Street Rd
Pennsylvania Turnpike
Bustleton Pk
Bustleton Ave
Philmont Ave
Trevose Rd
Southampton Rd
Worthington Rd
Evans St
Northeast Ave
Rennard St
Red Lion Rd
Verree Rd
Byberry Rd
County Line Rd
N. Buck Rd
S. Buck Rd
Pine Rd
Tomlinson Rd
Huntingdon Pike
New Rd
Bucks Co.
Philadelphia Co.
Montgomery Co.
CSX
SEPTA R 3
NORFOLK SOUTHERN

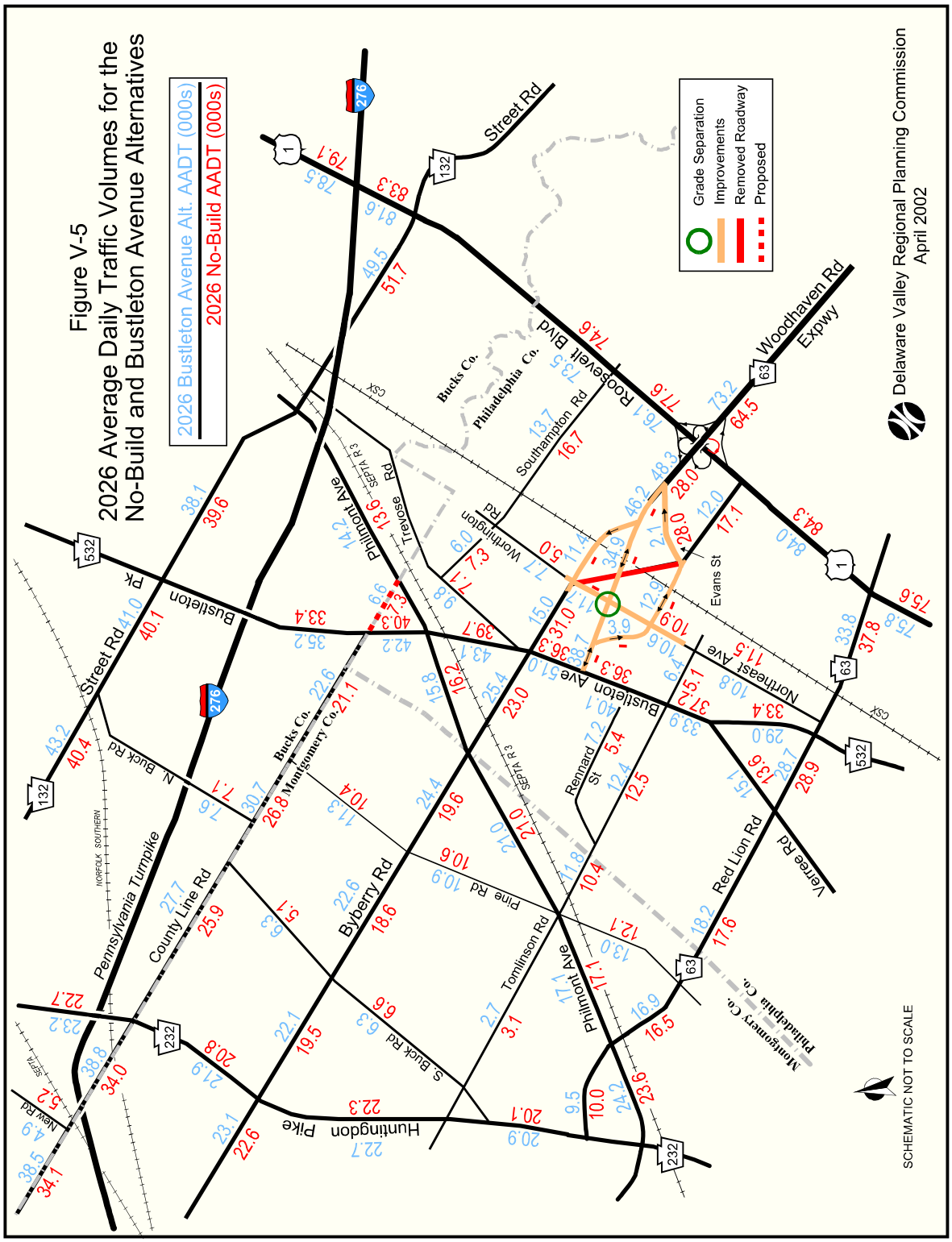


Figure V-5
2026 Average Daily Traffic Volumes for the
No-Build and Bustleton Avenue Alternatives
2026 Bustleton Avenue Alt. AADT (000s)
2026 No-Build AADT (000s)
Grade Separation
Improvements
Removed Roadway
Proposed
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE
Street Rd
Bustleton Pk
Woodhaven Rd
Expwy
Roosevelt Blvd
Southampton Rd
Bustleton Ave
Northeast Ave
Evans St
Verree Rd
Red Lion Rd
Philmont Ave
Tomlinson Rd
Byberry Rd
Pine Rd
Renmard St
Huntingdon Pike
County Line Rd
Pennsylvania Turnpike
N Buck Rd
S Buck Rd
New Rd
Philmont Ave
Terwood Rd
Worthington Rd
Bucks Co.
Philadelphia Co.
Montgomery Co.
Montgomery Co.
Philadelphia Co.
CSX
SEPTA R 5
SEPTA
NORFOLK SOUTHERN

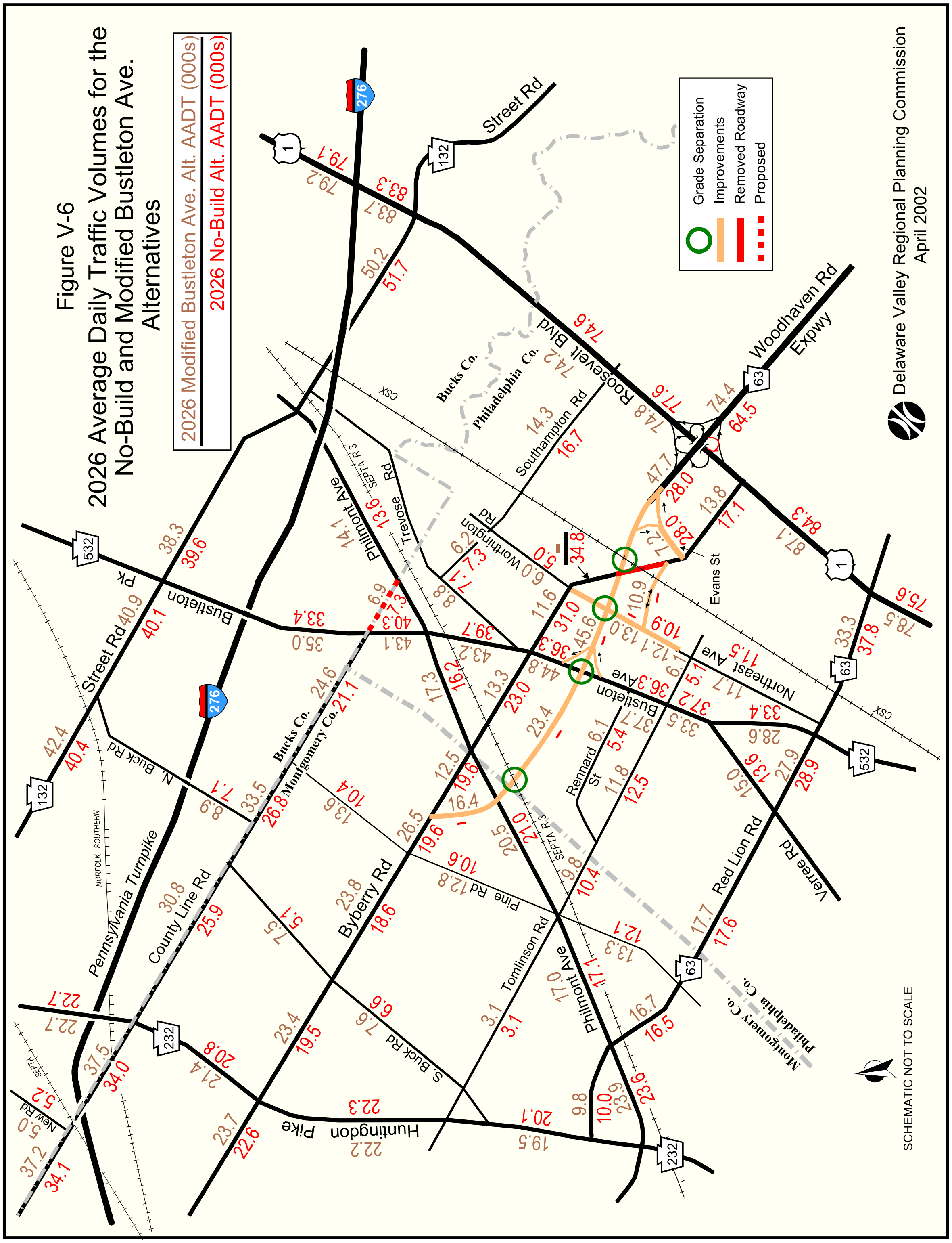


Figure V-6
2026 Average Daily Traffic Volumes for the No-Build and Modified Bustleton Ave. Alternatives
2026 Modified Bustleton Ave. Alt. AADT (000s)
2026 No-Build Alt. AADT (000s)
Grade Separation
Improvements
Removed Roadway
Proposed
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE

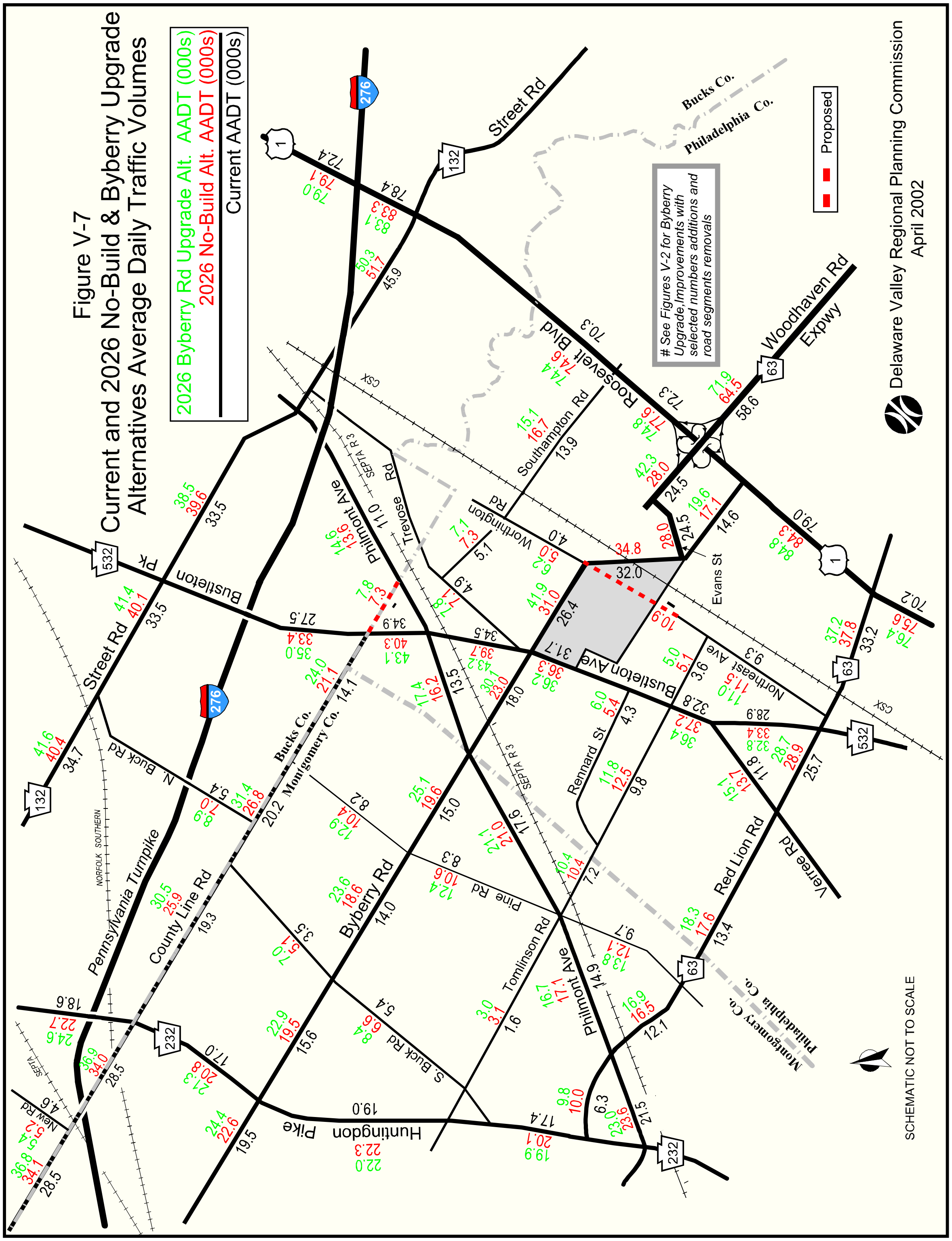


Figure V-7
Current and 2026 No-Build & Byberry Upgrade
Alternatives Average Daily Traffic Volumes
2026 Byberry Rd Upgrade Alt. AADT (000s)
2026 No-Build Alt. AADT (000s)
Current AADT (000s)
See Figures V-2 for Byberry Upgrade, improvements with selected numbers additions and road segments removals
Proposed
Street Rd
Roosevelt Blvd
Woodhaven Rd Expwy
Southampton Rd
Worthington Rd
Trevose Rd
Philmont Ave
Bustleton Pk
Bustleton Ave
Evans St
Northeast Ave
Verree Rd
Red Lion Rd
Rennard St
Byberry Rd
Pine Rd
Tomlinson Rd
Huntingdon Pike
S. Buck Rd
N. Buck Rd
County Line Rd
Pennsylvania Turnpike
New Rd
Bucks Co.
Philadelphia Co.
Montgomery Co.
CSX
SEPTA R 3
NORFOLK SOUTHERN
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE

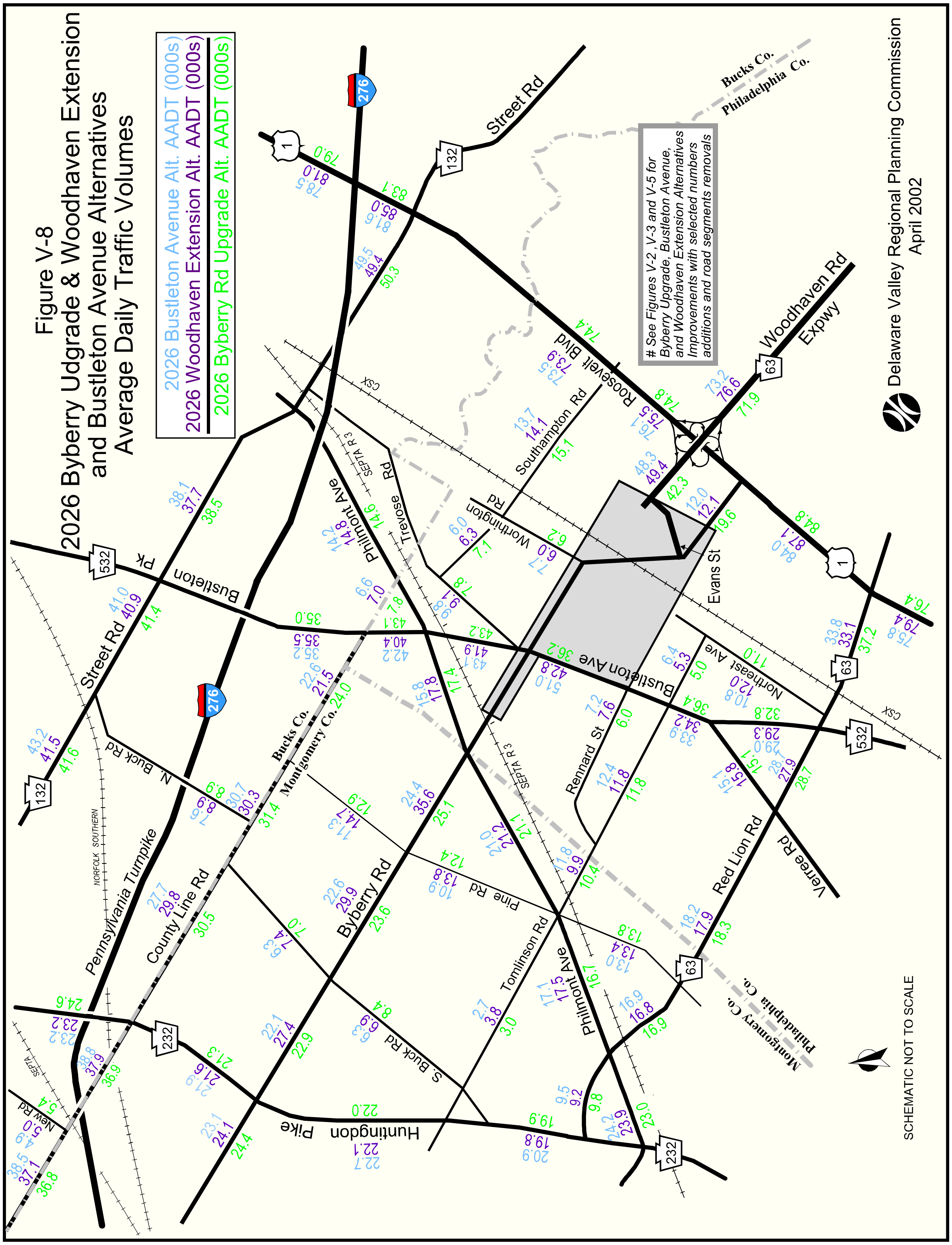


Figure V-8
2026 Byberry Udgrade & Woodhaven Extension
and Bustleton Avenue Alternatives
Average Daily Traffic Volumes
2026 Bustleton Avenue Alt. AADT (000s)
2026 Woodhaven Extension Alt. AADT (000s)
2026 Byberry Rd Upgrade Alt. AADT (000s)
See Figures V-2, V-3 and V-5 for Byberry Upgrade, Bustleton Avenue, and Woodhaven Extension Alternatives Improvements with selected numbers additions and road segments removals
Bucks Co.
Philadelphia Co.
Montgomery Co.
Delaware Valley Regional Planning Commission
April 2002
SCHEMATIC NOT TO SCALE

Table V-1. Comparison of 2026 No-Build Average Daily Traffic Volumes Versus Five Build Alternatives

Road	From	To	No-Build	Byberry Upgrade	Woodhaven Extension	Modified Extension	Bustleton Ave Alternative	Modified Bustleton Alternative
Byberry Rd.	US 1	Evans	17073	19606	12053	12357	11983	13768
Byberry Rd.	Evans	Worthington	34841	39117	9286	10492	12898	10860
Byberry Rd.	Worthington	Bustleton	31010	41882	11761	10954	14990	11605
Byberry Rd.	Bustleton	Philmont	22991	30060	13098	12061	25360	13313
Byberry Rd.	Philmont	Expressway	19609	25139	6587	6127	24385	12526
Byberry Rd.	Expressway	Pine Rd.	19609	25139	35265	31301	24385	26478
Byberry Rd.	Pine Rd.	Buck Rd.	18615	23642	29864	26247	22626	23843
Byberry Rd.	Buck Rd.	PA 232	19471	22931	27375	24782	22056	23351
Byberry Rd.	PA 232	Paper Mill Rd.	22554	24402	24124	23472	23117	23709
Woodhaven Rd.	Thornton	US 1	64493	71895	76611	75844	73189	74422
Woodhaven Rd.	US 1	Evans	27992	42282	49386	48938	48260	47691
Philmont Ave	PA 232	Red Lion	23589	23008	23910	24124	24228	23916
Philmont Ave	Red Lion	Tomlinson	17108	16695	17466	17691	17101	17035
Philmont Ave	Tomlinson	Byberry	20957	21127	21186	22146	20956	20490
Philmont Ave	Byberry	Bustleton	16168	17375	17815	17538	15752	17318
Philmont Ave	Bustleton	Street Rd.	13583	14649	14784	14510	14204	14051
Bustleton Ave	Red Lion	Veree	33402	32758	29257	29157	28970	28641
Bustleton Ave	Veree	Tomlinson	37153	36375	34159	34021	33874	33519
Bustleton Ave	Tomlinson Rd.	Expressway	36284	36226	38664	37674	40091	37708
Bustleton Ave	Expressway	Byberry	36284	36226	42849	42963	50995	44758
Bustleton Ave	Byberry	Philmont	39718	43171	41942	41955	43060	43165
Bustleton Ave	Philmont	County Line Rd.	40281	43096	40392	40409	42160	43089
Bustleton Ave	County Line Rd.	Street Rd.	33441	34998	35529	35711	35182	35009
Parallel Roads								
Red Lion Rd	Roosevelt Blvd	Bustleton	37780	37155	33084	33245	33839	33319
Red Lion Rd	Bustleton	Veree	28855	28718	27896	28282	28666	27861
Red Lion Rd	Veree	Pine Rd.	17616	18308	17897	18072	18195	17739
Red Lion Rd	Pine Rd.	Philmont	16485	16920	16777	17089	16869	16695
Red Lion Rd	Philmont	PA 232	9990	9827	9218	9341	9514	9780
Tomlinson Rd	Northeast Blvd.	Bustleton	5122	4952	5308	5425	6442	6138
Tomlinson Rd	Bustleton	Rennard	12454	11805	11773	12184	12442	11812
Tomlinson Rd	Rennard	Philmont	10378	10371	9929	9978	11821	9837

Table V-1. Comparison of 2026 No-Build Average Daily Traffic Volumes Versus Five Build Alternatives (Continued)

Road	From	To	No-Build	Byberry Upgrade	Woodhaven Extension	Modified Extension	Bustleton Ave Alternative	Modified Bustleton Alternative
Rennard St	Bustleton	Tomlinson	5430	5959	7553	7504	7171	6117
Southampton Rd.	US 1	Worthington	16718	15137	14136	14129	13719	14314
Southampton Rd.	Worthington	Trevose	7262	7053	6267	5774	5950	6194
County Line Rd.	Philmont	Bustleton	7329	7780	6956	7093	6604	6928
County Line Rd.	Bustleton	Pine Rd.	21133	24030	21546	21137	22600	24555
County Line Rd.	Pine Rd.	N. Buck	26805	31391	30326	30125	30718	33467
County Line Rd.	Buck Rd.	PA 232	25916	30537	29806	30791	27691	30827
County Line Rd.	PA 232	New Rd	33973	36939	37913	38183	38789	37477
County Line Rd.	New Rd	Davisville Rd	34083	36789	37072	37264	38541	37172
Street Rd.	US 1	Trevose Rd.	51700	50256	49439	49153	49516	50195
Street Rd.	Philmont	Bustleton	39648	38469	37666	37485	38088	38262
Street Rd.	Bustleton	N. Buck Rd.	40067	41447	40904	41863	41019	40941
Street Rd.	N. Buck Rd.	PA 232	40435	41640	41522	42372	43228	42353
Intersecting Roads								
Roosevelt Blvd	Grant Ave.	Red Lion	75610	76446	79358	79186	75751	78531
Roosevelt Blvd	Red Lion	Byberry	84327	84776	87134	87204	84026	87122
Roosevelt Blvd	Woodhaven Rd	Southampton	77580	74773	75456	76024	76083	74759
Roosevelt Blvd	Southampton	Old Lincoln Hwy	74577	74362	73912	73959	73537	74190
Roosevelt Blvd	Street Rd.	PA Tpke	83312	83088	85000	84495	81646	83680
Roosevelt Blvd	PA Tpke	Rockhill Rd.	79133	78994	81022	80540	78463	79226
Evans St.	Byberry Rd	Woodhaven Rd	27992	-	7568	6490	2055	7204
Northeast Ave	Red Lion Rd	Tomlinson	11549	10995	12007	11967	10750	11731
Northeast Ave	Tomlinson	Byberry	10942	11177	11694	11899	10575	12069
Northeast Ave	Byberry East	Byberry West	-	11328	11336	11620	11694	12972
Worthington Rd	Byberry	Southampton	4950	6157	5951	6306	7691	6036
Trevose Rd	Bustleton	Southampton	7109	7846	9063	8818	9839	8778
Veree Rd	Red Lion	Bustleton	13649	15068	15831	15447	15135	15000
Pine Rd.	Red Lion	Tomlinson	12075	13786	13372	12797	12993	13306
Pine Rd.	Tomlinson	Byberry	10563	12421	13810	13939	10905	12767
Pine Rd.	Byberry	County Line Rd.	10392	12881	14738	14025	11338	13577

Table V-1. Comparison of 2026 No-Build Average Daily Traffic Volumes Versus Five Build Alternatives (Continued)

Road	From	To	No-Build	Byberry Upgrade	Woodhaven Extension	Modified Extension	Bustleton Ave Alternative	Modified Bustleton Alternative
Buck Rd.	Tomlinson	Byberry	6577	8412	6923	7699	6290	7561
Buck Rd.	Byberry	County Line Rd.	5147	6994	7361	8196	6280	7509
Buck Rd.	County Line Rd.	Street Rd.	7070	8852	8936	8820	7571	8880
PA 232	Red Lion	Tomlinson	20084	19917	19779	19724	20877	19497
PA 232	Tomlinson	Byberry	22308	22018	22113	22602	22738	22248
PA 232	Byberry	County Line Rd.	20794	21321	21638	20888	21859	21427
PA 232	County Line Rd.	Street Rd.	22706	24574	23212	23606	23246	22673
New Rd	Rose Valley Rd	County Line Rd	5199	5383	5022	5037	4852	5026
New Links								
Woodhaven Connection to Byberry	Roosevelt Blvd.	Worthington		12069				
Woodhaven Expressway	US 1	Evans St.	-		49386	48938		47691
Woodhaven Expressway	Bustleton	Evans St.	-		52407	50736		45618
Woodhaven Expressway	Bustleton	Philmont	-		36362	33766		23428
Woodhaven Expressway	Philmont	Byberry	-		23500	20115		16425
Evans St. Ramp	Woodhaven Rd.	Byberry	-		7568	6490	2055	7204
Woodhaven Expressway SB Off	Byberry	Philmont	-		5682	5059		
Woodhaven Expressway	US 1	Evans St.					48260	
Woodhaven Expressway	Evans St.	Worthington St NB Off					46205	
Woodhaven Expressway NB Off-ramp	Woodhaven Rd.	Worthington St.					11350	
Woodhaven Expressway	Worthington St NB Off	Worthington SB Off					34855	
Woodhaven Expressway	Bustleton Ave.	Worthington SB Off					38712	
Woodhaven Expressway SB Access	Woodhaven SB On-ramp	Worthington St.					3857	

APPENDIX A

COMPARISON OF CURRENT COUNTS, 2026 NO-BUILD, AND THE FIVE BUILD ALTERNATIVES AVERAGE DAILY TRAFFIC VOLUMES

Table A-1. Current Counts and 2026 No-Build Average Daily Traffic Volumes

Road	From	To	Current Count	No-Build	Diff.	% Diff.
Byberry Rd.	US 1	Evans	14642	17073	2431	16.60%
Byberry Rd.	Evans	Worthington	31973	34841	2868	8.97%
Byberry Rd.	Worthington	Bustleton	26447	31010	4563	17.25%
Byberry Rd.	Bustleton	Philmont	18008	22991	4983	27.67%
Byberry Rd.	Philmont	Pine Rd.	15026	19609	4583	30.50%
Byberry Rd.	Pine Rd.	Buck Rd.	13984	18615	4631	33.12%
Byberry Rd.	Buck Rd.	PA 232	15600	19471	3871	24.81%
Byberry Rd.	PA 232	Paper Mill Rd.	19460	22554	3094	15.90%
Woodhaven Rd.	Thornton Rd	US 1	58575	64493	5918	10.10%
Woodhaven Rd.	US 1	Evans	24473	27992	3519	14.38%
Philmont Ave	PA 232	Red Lion	21460	23589	2129	9.92%
Philmont Ave	Red Lion	Tomlinson	14871	17108	2237	15.04%
Philmont Ave	Tomlinson	Byberry	17636	20957	3321	18.83%
Philmont Ave	Byberry	Bustleton	13546	16168	2622	19.36%
Philmont Ave	Bustleton	Street Rd.	11045	13583	2538	22.98%
Bustleton Ave	Red Lion	Veree	28924	33402	4478	15.48%
Bustleton Ave	Veree	Tomlinson	32844	37153	4309	13.12%
Bustleton Ave	Tomlinson Rd.	Byberry	31700	36284	4584	14.46%
Bustleton Ave	Byberry	Philmont	34502	39718	5216	15.12%
Bustleton Ave	Philmont	County Line Rd.	34855	40281	5426	15.57%
Bustleton Ave	County Line Rd.	Street Rd.	27510	33441	5931	21.56%
Parallel Roads						
Red Lion Rd.	Roosevelt Blvd	Bustleton	33241	37780	4539	13.65%
Red Lion Rd.	Bustleton	Veree	25657	28855	3198	12.46%
Red Lion Rd.	Veree	Pine Rd.	13358	17616	4258	31.88%
Red Lion Rd.	Pine Rd.	Philmont	12081	16485	4404	36.45%
Red Lion Rd.	Philmont	PA 232	6271	9990	3719	59.30%
Tomlinson Rd.	Northeast Blvd.	Bustleton	3630	5122	1492	41.10%
Tomlinson Rd.	Bustleton	Rennard	9813	12454	2641	26.92%
Tomlinson Rd.	Rennard	Philmont	7179	10378	3199	44.57%
Tomlinson Rd.	Philmont	Buck Rd.	1632	3142	1510	92.54%
Rennard St	Bustleton	Tomlinson	4305	5430	1125	26.12%
Southampton Rd.	US 1	Worthington	13876	16718	2842	20.48%
Southampton Rd.	Worthington	Trevose	5093	7262	2169	42.58%
County Line Rd.	Philmont	Bustleton		7329		
County Line Rd.	Bustleton	Pine Rd.	14138	21133	6995	49.48%
County Line Rd.	Pine Rd.	N. Buck	20233	26805	6572	32.48%
County Line Rd.	Buck Rd.	PA 232	19317	25916	6599	34.16%
County Line Rd.	PA 232	New Rd	28484	33973	5489	19.27%
County Line Rd.	New Rd	Davisville Rd	28508	34083	5575	19.56%
Street Rd.	US 1	Trevose Rd.	45900	51700	5800	12.64%
Street Rd.	Philmont	Bustleton	33506	39648	6142	18.33%
Street Rd.	Bustleton	N. Buck Rd.	33532	40067	6535	19.49%
Street Rd.	N. Buck Rd.	PA 232	34681	40435	5754	16.59%

Table A-1. Current Counts and 2026 No-Build Average Daily Traffic Volumes (Continued)

Road	From	To	Current Count	No-Build	Diff.	% Diff.
Intersecting Roads						
Roosevelt Blvd	Grant Ave.	Red Lion	70159	75610	5451	7.77%
Roosevelt Blvd	Red Lion	Byberry	78974	84327	5353	6.78%
Roosevelt Blvd	Woodhaven Rd	Southampton	72297	77580	5283	7.31%
Roosevelt Blvd	Southampton	Old Lincoln Hwy	70300	74577	4277	6.08%
Roosevelt Blvd	Street Rd.	PA Tpke	78396	83312	4916	6.27%
Roosevelt Blvd	PA Tpke	Rockhill Rd.	72350	79133	6783	9.38%
Evans St.	Byberry Rd	Woodhaven Rd	24473	27992	3519	14.38%
Northeast Ave	Red Lion Rd	Tomlinson	9300	11549	2249	24.18%
Northeast Ave	Tomlinson	Byberry	-	10942	-	-
Worthington Rd	Byberry	Southampton	3985	4950	965	24.22%
Trevose Rd	Bustleton	Southampton	4900	7109	2209	45.08%
Veree Rd	Red Lion	Bustleton	11800	13649	1849	15.67%
Pine Rd.	Red Lion	Tomlinson	9693	12075	2382	24.57%
Pine Rd.	Tomlinson	Byberry	8293	10563	2270	27.37%
Pine Rd.	Byberry	County Line Rd.	8236	10392	2156	26.17%
Buck Rd.	Tomlinson	Byberry	5430	6577	1147	21.12%
Buck Rd.	Byberry	County Line Rd.	3549	5147	1598	45.03%
Buck Rd.	County Line Rd.	Street Rd.	5442	7070	1628	29.92%
PA 232	Red Lion	Tomlinson	17366	20084	2718	15.65%
PA 232	Tomlinson	Byberry	18996	22308	3312	17.43%
PA 232	Byberry	County Line Rd.	16993	20794	3801	22.37%
PA 232	County Line Rd.	Street Rd.	18627	22706	4079	21.90%
New Rd	Rose Valley Rd	County Line Rd	4626	5199	573	12.39%

Table A-2. 2026 No-Build and Byberry Road Upgrade Average Daily Traffic Volumes

Road	From	To	No-Build	Byberry Upgrade	Diff.	% Diff.
Byberry Rd.	US 1	Evans	17073	19606	2534	14.84%
Byberry Rd.	Evans	Worthington	34841	39117	4277	12.27%
Byberry Rd.	Worthington	Bustleton	31010	41882	10872	35.06%
Byberry Rd.	Bustleton	Philmont	22991	30060	7069	30.74%
Byberry Rd.	Philmont	Pine Rd.	19609	25139	5530	28.20%
Byberry Rd.	Pine Rd.	Buck Rd.	18615	23642	5027	27.01%
Byberry Rd.	Buck Rd.	PA 232	19471	22931	3460	17.77%
Byberry Rd.	PA 232	Paper Mill Rd.	22554	24402	1848	8.20%
Woodhaven Rd.	Thornton	US 1	64493	71895	7402	11.48%
Woodhaven Rd.	US 1	Evans	27992	42282	14290	51.05%
Philmont Ave	PA 232	Red Lion	23589	23008	-581	-2.46%
Philmont Ave	Red Lion	Tomlinson	17108	16695	-413	-2.42%
Philmont Ave	Tomlinson	Byberry	20957	21127	170	0.81%
Philmont Ave	Byberry	Bustleton	16168	17375	1207	7.46%
Philmont Ave	Bustleton	Street Rd.	13583	14649	1066	7.85%
Bustleton Ave	Red Lion	Veree	33402	32758	-644	-1.93%
Bustleton Ave	Veree	Tomlinson	37153	36375	-778	-2.10%
Bustleton Ave	Tomlinson Rd.	Byberry	36284	36226	-58	-0.16%
Bustleton Ave	Byberry	Philmont	39718	43171	3453	8.69%
Bustleton Ave	Philmont	County Line Rd.	40281	43096	2815	6.99%
Bustleton Ave	County Line Rd.	Street Rd.	33441	34998	1557	4.66%
Parallel Roads						
Red Lion Rd.	Roosevelt Blvd	Bustleton	37780	37155	-625	-1.65%
Red Lion Rd.	Bustleton	Veree	28855	28718	-137	-0.47%
Red Lion Rd.	Veree	Pine Rd.	17616	18308	692	3.93%
Red Lion Rd.	Pine Rd.	Philmont	16485	16920	435	2.64%
Red Lion Rd.	Philmont	PA 232	9990	9827	-163	-1.63%
Tomlinson Rd.	Northeast Blvd.	Bustleton	5122	4952	-170	-3.33%
Tomlinson Rd.	Bustleton	Rennard	12454	11805	-649	-5.21%
Tomlinson Rd.	Rennard	Philmont	10378	10371	-8	-0.08%
Tomlinson Rd.	Philmont	Buck Rd.	3142	2999	-143	-4.56%
Rennard St	Bustleton	Tomlinson	5430	5959	530	9.76%
Southampton Rd.	US 1	Worthington	16718	15137	-1582	-9.46%
Southampton Rd.	Worthington	Trevose	7262	7053	-209	-2.87%
County Line Rd.	Philmont	Bustleton	7329	7780	451	6.15%
County Line Rd.	Bustleton	Pine Rd.	21133	24030	2897	13.71%
County Line Rd.	Pine Rd.	N. Buck	26805	31391	4586	17.11%
County Line Rd.	Buck Rd.	PA 232	25916	30537	4621	17.83%
County Line Rd.	PA 232	New Rd	33973	36939	2966	8.73%
County Line Rd.	New Rd	Davisville Rd	34083	36789	2706	7.94%
Street Rd.	US 1	Trevose Rd.	51700	50256	-1444	-2.79%
Street Rd.	US 2	Trevose Rd.	51701	50257	-1444	-2.79%
Street Rd.	US 3	Trevose Rd.	51702	50258	-1444	-2.79%
Street Rd.	US 4	Trevose Rd.	51703	50259	-1444	-2.79%

Table A-2. 2026 No-Build and Byberry Road Upgrade Average Daily Traffic Volumes (Continued)

Road	From	To	No-Build	Byberry Upgrade	Diff.	% Diff.
Intersecting Roads						
Roosevelt Blvd	Grant Ave.	Red Lion	75610	76446	836	1.11%
Roosevelt Blvd	Red Lion	Byberry	84327	84776	448	0.53%
Roosevelt Blvd	Woodhaven Rd	Southampton	77580	74773	-2807	-3.62%
Roosevelt Blvd	Southampton	Old Lincoln Hwy	74577	74362	-215	-0.29%
Roosevelt Blvd	Street Rd.	PA Tpke	83312	83088	-224	-0.27%
Roosevelt Blvd	PA Tpke	Rockhill Rd.	79133	78994	-139	-0.18%
Evans St.	Byberry Rd	Woodhaven Rd	27992	-	-	-
Northeast Ave	Red Lion Rd	Tomlinson	11549	10995	-554	-4.80%
Northeast Ave	Tomlinson	Byberry	10942	11177	235	2.15%
Northeast Ave	Byberry East	Byberry West	-	11328	-	-
Worthington Rd	Byberry	Southampton	4950	6157	1207	24.38%
Trevose Rd	Bustleton	Southampton	7109	7846	737	10.37%
Veree Rd	Red Lion	Bustleton	13649	15068	1419	10.40%
Pine Rd.	Red Lion	Tomlinson	12075	13786	1711	14.17%
Pine Rd.	Tomlinson	Byberry	10563	12421	1858	17.59%
Pine Rd.	Byberry	County Line Rd.	10392	12881	2489	23.96%
Buck Rd.	Tomlinson	Byberry	6577	8412	1835	27.91%
Buck Rd.	Byberry	County Line Rd.	5147	6994	1847	35.88%
Buck Rd.	County Line Rd.	Street Rd.	7070	8852	1782	25.20%
PA 232	Red Lion	Tomlinson	20084	19917	-167	-0.83%
PA 232	Tomlinson	Byberry	22308	22018	-290	-1.30%
PA 232	Byberry	County Line Rd.	20794	21321	527	2.53%
PA 232	County Line Rd.	Street Rd.	22706	24574	1869	8.23%
New Rd	Rose Valley Rd	County Line Rd	5199	5383	184	3.54%
New Links						
Woodhaven Connection to Byberry	Roosevelt Blvd.	Worthington	-	12069	-	-

Table A-3. 2026 No-Build and Woodhaven Extension Alternative Average Daily Traffic Volumes

Road	From	To	No-Build	Woodhaven Extension	Diff.	% Diff.
Byberry Rd.	US 1	Evans	17073	12053	-5019	-29.40%
Byberry Rd.	Evans	Worthington	34841	9286	-25555	-73.35%
Byberry Rd.	Worthington	Bustleton	31010	11761	-19248	-62.07%
Byberry Rd.	Bustleton	Philmont	22991	13098	-9894	-43.03%
Byberry Rd.	Philmont	Expressway	19609	6587	-13022	-66.41%
Byberry Rd.	Expressway	Pine Rd.	19609	35265	15656	79.84%
Byberry Rd.	Pine Rd.	Buck Rd.	18615	29864	11249	60.43%
Byberry Rd.	Buck Rd.	PA 232	19471	27375	7904	40.59%
Byberry Rd.	PA 232	Paper Mill Rd.	22554	24124	1570	6.96%
Woodhaven Rd.	Thornton	US 1	64493	76611	12118	18.79%
Woodhaven Rd.	US 1	Evans	27992	49386	21394	76.43%
Philmont Ave	PA 232	Red Lion	23589	23910	322	1.36%
Philmont Ave	Red Lion	Tomlinson	17108	17466	358	2.09%
Philmont Ave	Tomlinson	Byberry	20957	21186	229	1.09%
Philmont Ave	Byberry	Bustleton	16168	17815	1647	10.19%
Philmont Ave	Bustleton	Street Rd.	13583	14784	1201	8.84%
Bustleton Ave	Red Lion	Veree	33402	29257	-4145	-12.41%
Bustleton Ave	Veree	Tomlinson	37153	34159	-2994	-8.06%
Bustleton Ave	Tomlinson Rd.	Expressway	36284	38664	2380	6.56%
Bustleton Ave	Expressway	Byberry	36284	42849	6565	18.09%
Bustleton Ave	Byberry	Philmont	39718	41942	2224	5.60%
Bustleton Ave	Philmont	County Line Rd.	40281	40392	111	0.28%
Bustleton Ave	County Line Rd.	Street Rd.	33441	35529	2088	6.24%
Parallel Roads						
Red Lion Rd	Roosevelt Blvd	Bustleton	37780	33084	-4696	-12.43%
Red Lion Rd	Bustleton	Veree	28855	27896	-959	-3.32%
Red Lion Rd	Veree	Pine Rd.	17616	17897	281	1.60%
Red Lion Rd	Pine Rd.	Philmont	16485	16777	292	1.77%
Red Lion Rd	Philmont	PA 232	9990	9218	-772	-7.72%
Tomlinson Rd	Northeast Blvd.	Bustleton	5122	5308	186	3.63%
Tomlinson Rd	Bustleton	Rennard	12454	11773	-682	-5.47%
Tomlinson Rd	Rennard	Philmont	10378	9929	-449	-4.33%
Tomlinson Rd	Philmont	Buck Rd.	3142	3815	673	21.42%
Rennard St	Bustleton	Tomlinson	5430	7553	2123	39.11%
Southampton Rd.	US 1	Worthington	16718	14136	-2582	-15.45%
Southampton Rd.	Worthington	Trevose	7262	6267	-994	-13.69%
County Line Rd.	Philmont	Bustleton	7329	6956	-373	-5.09%
County Line Rd.	Bustleton	Pine Rd.	21133	21546	413	1.96%
County Line Rd.	Pine Rd.	N. Buck	26805	30326	3521	13.14%
County Line Rd.	Buck Rd.	PA 232	25916	29806	3890	15.01%
County Line Rd.	PA 232	New Rd	33973	37913	3940	11.60%
County Line Rd.	New Rd	Davisville Rd	34083	37072	2989	8.77%
Street Rd.	US 1	Trevose Rd.	51700	49439	-2261	-4.37%
Street Rd.	Philmont	Bustleton	39648	37666	-1982	-5.00%
Street Rd.	Bustleton	N. Buck Rd.	40067	40904	837	2.09%
Street Rd.	N. Buck Rd.	PA 232	40435	41522	1086	2.69%

Table A-3. 2026 No-Build and Woodhaven Extension Alternative Average Daily Traffic Volumes (Continued)

Road	From	To	No-Build	Woodhaven Extension	Diff.	% Diff.
Intersecting Roads						
Roosevelt Blvd	Grant Ave.	Red Lion	75610	79358	3748	4.96%
Roosevelt Blvd	Red Lion	Byberry	84327	87134	2807	3.33%
Roosevelt Blvd	Woodhaven Rd	Southampton	77580	75456	-2124	-2.74%
Roosevelt Blvd	Southampton	Old Lincoln Hwy	74577	73912	-665	-0.89%
Roosevelt Blvd	Street Rd.	PA Tpke	83312	85000	1688	2.03%
Roosevelt Blvd	PA Tpke	Rockhill Rd.	79133	81022	1889	2.39%
Evans St.	Byberry Rd	Woodhaven Rd	27992	7568	-	-
Northeast Ave	Red Lion Rd	Tomlinson	11549	12007	458	3.97%
Northeast Ave	Tomlinson	Byberry	10942	11694	752	6.87%
Northeast Ave	Byberry East	Byberry West	-	11336		
Worthington Rd	Byberry	Southampton	4950	5951	1001	20.23%
Trevose Rd	Bustleton	Southampton	7109	9063	1954	27.48%
Veree Rd	Red Lion	Bustleton	13649	15831	2182	15.98%
Pine Rd.	Red Lion	Tomlinson	12075	13372	1297	10.74%
Pine Rd.	Tomlinson	Byberry	10563	13810	3247	30.74%
Pine Rd.	Byberry	County Line Rd.	10392	14738	4347	41.83%
Buck Rd.	Tomlinson	Byberry	6577	6923	346	5.26%
Buck Rd.	Byberry	County Line Rd.	5147	7361	2214	43.02%
Buck Rd.	County Line Rd.	Street Rd.	7070	8936	1866	26.39%
PA 232	Red Lion	Tomlinson	20084	19779	-305	-1.52%
PA 232	Tomlinson	Byberry	22308	22113	-195	-0.87%
PA 232	Byberry	County Line Rd.	20794	21638	844	4.06%
PA 232	County Line Rd.	Street Rd.	22706	23212	506	2.23%
New Rd	Rose Valley Rd	County Line Rd	5199	5022	-177	-3.40%
New Links						
Woodhaven Expressway	US 1	Evans St.	-	49386	-	-
Woodhaven Expressway	Bustleton	Evans St.	-	52407	-	-
Woodhaven Expressway	Bustleton	Philmont	-	36362	-	-
Woodhaven Expressway	Philmont	Byberry	-	23500	-	-
Evans St. Ramp	Woodhaven Rd.	Byberry	-	7568	-	-
Woodhaven Expressway SB Off	Byberry	Philmont	-	5682	-	-

Table A-4. 2026 No-Build and Modified Woodhaven Extension Alternative Average Daily Traffic Volumes

Road	From	To	No-Build	Modified Extension	Diff.	% Diff.
Byberry Rd.	US 1	Evans	17073	12357	-4715	-27.62%
Byberry Rd.	Evans	Worthington	34841	10492	-24349	-69.88%
Byberry Rd.	Worthington	Bustleton	31010	10954	-20055	-64.67%
Byberry Rd.	Bustleton	Philmont	22991	12061	-10931	-47.54%
Byberry Rd.	Philmont	Expressway	19609	6127	-13482	-68.75%
Byberry Rd.	Expressway	Pine Rd.	19609	31301	11692	59.63%
Byberry Rd.	Pine Rd.	Buck Rd.	18615	26247	7632	41.00%
Byberry Rd.	Buck Rd.	PA 232	19471	24782	5311	27.28%
Byberry Rd.	PA 232	Paper Mill Rd.	22554	23472	918	4.07%
Woodhaven Rd.	Thornton	US 1	64493	75844	11351	17.60%
Woodhaven Rd.	US 1	Evans	27992	48938	20946	74.83%
Philmont Ave	PA 232	Red Lion	23589	24124	536	2.27%
Philmont Ave	Red Lion	Tomlinson	17108	17691	583	3.41%
Philmont Ave	Tomlinson	Byberry	20957	22146	1189	5.67%
Philmont Ave	Byberry	Bustleton	16168	17538	1370	8.47%
Philmont Ave	Bustleton	Street Rd.	13583	14510	927	6.82%
Bustleton Ave	Red Lion	Veree	33402	29157	-4245	-12.71%
Bustleton Ave	Veree	Tomlinson	37153	34021	-3132	-8.43%
Bustleton Ave	Tomlinson Rd.	Expressway	36284	37674	1390	3.83%
Bustleton Ave	Expressway	Byberry	36284	42963	6679	18.41%
Bustleton Ave	Byberry	Philmont	39718	41955	2237	5.63%
Bustleton Ave	Philmont	County Line Rd.	40281	40409	128	0.32%
Bustleton Ave	County Line Rd.	Street Rd.	33441	35711	2270	6.79%
Parallel Roads						
Red Lion Rd	Roosevelt Blvd	Bustleton	37780	33245	-4535	-12.00%
Red Lion Rd	Bustleton	Veree	28855	28282	-573	-1.99%
Red Lion Rd	Veree	Pine Rd.	17616	18072	456	2.59%
Red Lion Rd	Pine Rd.	Philmont	16485	17089	604	3.66%
Red Lion Rd	Philmont	PA 232	9990	9341	-649	-6.49%
Tomlinson Rd	Northeast Blvd.	Bustleton	5122	5425	303	5.91%
Tomlinson Rd	Bustleton	Rennard	12454	12184	-271	-2.17%
Tomlinson Rd	Rennard	Philmont	10378	9978	-400	-3.86%
Tomlinson Rd	Philmont	Buck Rd.	3142	3916	774	24.64%
Rennard St	Bustleton	Tomlinson	5430	7504	2074	38.20%
Southampton Rd.	US 1	Worthington	16718	14129	-2589	-15.49%
Southampton Rd.	Worthington	Trevose	7262	5774	-1487	-20.48%
County Line Rd.	Philmont	Bustleton	7329	7093	-236	-3.22%
County Line Rd.	Bustleton	Pine Rd.	21133	21137	4	0.02%
County Line Rd.	Pine Rd.	N. Buck	26805	30125	3320	12.39%
County Line Rd.	Buck Rd.	PA 232	25916	30791	4875	18.81%
County Line Rd.	PA 232	New Rd	33973	38183	4210	12.39%
County Line Rd.	New Rd	Davisville Rd	34083	37264	3181	9.33%
Street Rd.	US 1	Trevose Rd.	51700	49153	-2547	-4.93%
Street Rd.	Philmont	Bustleton	39648	37485	-2163	-5.46%
Street Rd.	Bustleton	N. Buck Rd.	40067	41863	1796	4.48%
Street Rd.	N. Buck Rd.	PA 232	40435	42372	1936	4.79%

Table A-4. 2026 No-Build and Modified Woodhaven Extension Alternative Average Daily Traffic Volumes (ContInued)

Road	From	To	No-Build	Modified Extension	Diff.	% Diff.
Intersecting Roads						
Roosevelt Blvd	Grant Ave.	Red Lion	75610	79186	3576	4.73%
Roosevelt Blvd	Red Lion	Byberry	84327	87204	2877	3.41%
Roosevelt Blvd	Woodhaven Rd	Southampton	77580	76024	-1556	-2.01%
Roosevelt Blvd	Southampton	Old Lincoln Hwy	74577	73959	-618	-0.83%
Roosevelt Blvd	Street Rd.	PA Tpke	83312	84495	1183	1.42%
Roosevelt Blvd	PA Tpke	Rockhill Rd.	79133	80540	1407	1.78%
Evans St.	Byberry Rd	Woodhaven Rd	27992	6490	-	-
Northeast Ave	Red Lion Rd	Tomlinson	11549	11967	418	3.62%
Northeast Ave	Tomlinson	Byberry	10942	11899	957	8.75%
Northeast Ave	Byberry East	Byberry West	-	11620		
Worthington Rd	Byberry	Southampton	4950	6306	1356	27.40%
Trevose Rd	Bustleton	Southampton	7109	8818	1709	24.03%
Veree Rd	Red Lion	Bustleton	13649	15447	1798	13.17%
Pine Rd.	Red Lion	Tomlinson	12075	12797	722	5.98%
Pine Rd.	Tomlinson	Byberry	10563	13939	3376	31.96%
Pine Rd.	Byberry	County Line Rd.	10392	14025	3634	34.97%
Buck Rd.	Tomlinson	Byberry	6577	7699	1122	17.06%
Buck Rd.	Byberry	County Line Rd.	5147	8196	3049	59.24%
Buck Rd.	County Line Rd.	Street Rd.	7070	8020	950	13.44%
PA 232	Red Lion	Tomlinson	20084	19724	-360	-1.79%
PA 232	Tomlinson	Byberry	22308	22602	294	1.32%
PA 232	Byberry	County Line Rd.	20794	20888	94	0.45%
PA 232	County Line Rd.	Street Rd.	22706	23606	900	3.96%
New Rd	Rose Valley Rd	County Line Rd	5199	5037	-162	-3.12%
New Links						
Woodhaven Expressway	US 1	Evans St.	-	48938	-	-
Woodhaven Expressway	Bustleton	Evans St.	-	50736	-	-
Woodhaven Expressway	Bustleton	Philmont	-	33766	-	-
Woodhaven Expressway	Philmont	Byberry	-	20115	-	-
Evans St. Ramp	Woodhaven Rd.	Byberry	-	6490	-	-
Woodhaven Expressway SB Off	Byberry	Philmont	-	5059	-	-

Table A-5. 2026 No-Build and Bustleton Avenue Alternative Average Daily Traffic Volumes

Road	From	To	No-Build	Bustleton Ave Alternative	Diff.	% Diff.
Byberry Rd.	US 1	Evans	17073	11983	-5090	-29.81%
Byberry Rd.	Evans	Worthington	34841	12898	-21943	-62.98%
Byberry Rd.	Worthington	Bustleton	31010	14990	-16020	-51.66%
Byberry Rd.	Bustleton	Philmont	22991	25360	2369	10.30%
Byberry Rd.	Philmont	Pine Rd.	19609	24385	4776	24.36%
Byberry Rd.	Pine Rd.	Buck Rd.	18615	22626	4011	21.55%
Byberry Rd.	Buck Rd.	PA 232	19471	22056	2585	13.28%
Byberry Rd.	PA 232	Paper Mill Rd.	22554	23117	563	2.50%
Woodhaven Rd.	Thornton	US 1	64493	73189	8696	13.48%
Woodhaven Rd.	US 1	Evans	27992	48260	20268	72.41%
Philmont Ave	PA 232	Red Lion	23589	24228	639	2.71%
Philmont Ave	Red Lion	Tomlinson	17108	17101	-7	-0.04%
Philmont Ave	Tomlinson	Byberry	20957	20956	-1	0.00%
Philmont Ave	Byberry	Bustleton	16168	15752	-416	-2.57%
Philmont Ave	Bustleton	Street Rd.	13583	14204	621	4.57%
Bustleton Ave	Red Lion	Veree	33402	28970	-4432	-13.27%
Bustleton Ave	Veree	Tomlinson	37153	33874	-3279	-8.83%
Bustleton Ave	Tomlinson Rd.	Expressway	36284	40091	3807	10.49%
Bustleton Ave	Expressway	Byberry	36284	50995	14711	40.55%
Bustleton Ave	Byberry	Philmont	39718	43060	3342	8.41%
Bustleton Ave	Philmont	County Line Rd.	40281	42160	1879	4.66%
Bustleton Ave	County Line Rd.	Street Rd.	33441	35182	1741	5.21%
Parallel Roads						
Red Lion Rd	Roosevelt Blvd	Bustleton	37780	33839	-3941	-10.43%
Red Lion Rd	Bustleton	Veree	28855	28666	-189	-0.65%
Red Lion Rd	Veree	Pine Rd.	17616	18195	579	3.29%
Red Lion Rd	Pine Rd.	Philmont	16485	16869	384	2.33%
Red Lion Rd	Philmont	PA 232	9990	9514	-476	-4.76%
Tomlinson Rd	Northeast Blvd.	Bustleton	5122	6442	1320	25.77%
Tomlinson Rd	Bustleton	Rennard	12454	12442	-12	-0.10%
Tomlinson Rd	Rennard	Philmont	10378	11821	1443	13.90%
Tomlinson Rd	Philmont	Buck Rd.	3142	2714	-428	-13.63%
Rennard St	Bustleton	Tomlinson	5430	7171	1741	32.07%
Southampton Rd.	US 1	Worthington	16718	13719	-2999	-17.94%
Southampton Rd.	Worthington	Trevose	7262	5950	-1312	-18.06%
County Line Rd.	Philmont	Bustleton	7329	6604	-725	-9.89%
County Line Rd.	Bustleton	Pine Rd.	21133	22600	1467	6.94%
County Line Rd.	Pine Rd.	N. Buck	26805	30718	3913	14.60%
County Line Rd.	Buck Rd.	PA 232	25916	27691	1775	6.85%
County Line Rd.	PA 232	New Rd	33973	38789	4816	14.18%
County Line Rd.	New Rd	Davisville Rd	34083	38541	4458	13.08%
Street Rd.	US 1	Trevose Rd.	51700	49516	-2184	-4.22%
Street Rd.	Philmont	Bustleton	39648	38088	-1560	-3.93%
Street Rd.	Bustleton	N. Buck Rd.	40067	41019	952	2.38%
Street Rd.	N. Buck Rd.	PA 232	40435	43228	2793	6.91%

Table A-5. 2026 No-Build and Bustleton Avenue Alternative Average Daily Traffic Volumes (Continued)

Road	From	To	No-Build	Bustleton Ave Alternative	Diff.	% Diff.
Intersecting Roads						
Roosevelt Blvd	Grant Ave.	Red Lion	75610	75751	141	0.19%
Roosevelt Blvd	Red Lion	Byberry	84327	84026	-301	-0.36%
Roosevelt Blvd	Woodhaven Rd	Southampton	77580	76083	-1497	-1.93%
Roosevelt Blvd	Southampton	Old Lincoln Hwy	74577	73537	-1040	-1.39%
Roosevelt Blvd	Street Rd.	PA Tpke	83312	81646	-1666	-2.00%
Roosevelt Blvd	PA Tpke	Rockhill Rd.	79133	78463	-670	-0.85%
Evans St.	Byberry Rd	Woodhaven Rd	27992	2055	-25937	-92.66%
Northeast Ave	Red Lion Rd	Tomlinson	11549	10750	-799	-6.92%
Northeast Ave	Tomlinson	Byberry	10942	10575	-367	-3.35%
Northeast Ave	Byberry East	Byberry West	-	11694	-	-
Worthington Rd	Byberry	Southampton	4950	7691	2741	55.37%
Trevose Rd	Bustleton	Southampton	7109	9839	2730	38.40%
Veree Rd	Red Lion	Bustleton	13649	15135	1486	10.89%
Pine Rd.	Red Lion	Tomlinson	12075	12993	918	7.60%
Pine Rd.	Tomlinson	Byberry	10563	10905	342	3.24%
Pine Rd.	Byberry	County Line Rd.	10392	11338	946	9.11%
Buck Rd.	Tomlinson	Byberry	6577	6290	-287	-4.36%
Buck Rd.	Byberry	County Line Rd.	5147	6280	1133	22.01%
Buck Rd.	County Line Rd.	Street Rd.	7070	7571	501	7.08%
PA 232	Red Lion	Tomlinson	20084	20877	793	3.95%
PA 232	Tomlinson	Byberry	22308	22738	430	1.93%
PA 232	Byberry	County Line Rd.	20794	21859	1065	5.12%
PA 232	County Line Rd.	Street Rd.	22706	23246	540	2.38%
New Rd	Rose Valley Rd	County Line Rd	5199	4852	-347	-6.67%
New Links						
Woodhaven Expressway	US 1	Evans St.	-	48260	-	-
Woodhaven Expressway	Evans St.	Worthington St NB Off	-	46205	-	-
Woodhaven Expressway NB Off-ramp	Woodhaven Rd.	Worthington St.	-	11350	-	-
Woodhaven Expressway	Worthington St NB Off	Worthington SB Off	-	34855	-	-
Woodhaven Expressway	Bustleton Ave.	Worthington SB Off	-	38712	-	-
Woodhaven Expressway SB Access	Woodhaven SB On-ramp	Worthington St.	-	3857	-	-
Evans St. Ramp	Woodhaven Rd.	Worthington St.	-	2055	-	-

Table A-6. 2026 No-Build and Modified Bustleton Alternative Average Daily Traffic Volumes

Road	From	To	No-Build	Modified Bustleton Alternative	Diff.	% Diff.
Byberry Rd.	US 1	Evans	17073	13768	-3305	-19.36%
Byberry Rd.	Evans	Worthington	34841	10860	-23981	-68.83%
Byberry Rd.	Worthington	Bustleton	31010	11605	-19404	-62.58%
Byberry Rd.	Bustleton	Philmont	22991	13313	-9679	-42.10%
Byberry Rd.	Philmont	Expressway	19609	12526	-7083	-36.12%
Byberry Rd.	Expressway	Pine Rd.	19609	26478	6869	35.03%
Byberry Rd.	Pine Rd.	Buck Rd.	18615	23843	5228	28.08%
Byberry Rd.	Buck Rd.	PA 232	19471	23351	3880	19.93%
Byberry Rd.	PA 232	Paper Mill Rd.	22554	23709	1155	5.12%
Woodhaven Rd.	Thornton	US 1	64493	74422	9929	15.39%
Woodhaven Rd.	US 1	Evans	27992	47691	19699	70.37%
Philmont Ave	PA 232	Red Lion	23589	23916	328	1.39%
Philmont Ave	Red Lion	Tomlinson	17108	17035	-73	-0.43%
Philmont Ave	Tomlinson	Byberry	20957	20490	-467	-2.23%
Philmont Ave	Byberry	Bustleton	16168	17318	1150	7.11%
Philmont Ave	Bustleton	Street Rd.	13583	14051	468	3.45%
Bustleton Ave	Red Lion	Veree	33402	28641	-4761	-14.25%
Bustleton Ave	Veree	Tomlinson	37153	33519	-3634	-9.78%
Bustleton Ave	Tomlinson Rd.	Expressway	36284	37708	1424	3.92%
Bustleton Ave	Expressway	Byberry	36284	44758	8474	23.35%
Bustleton Ave	Byberry	Philmont	39718	43165	3447	8.68%
Bustleton Ave	Philmont	County Line Rd.	40281	43089	2808	6.97%
Bustleton Ave	County Line Rd.	Street Rd.	33441	35009	1568	4.69%
Parallel Roads						
Red Lion Rd	Roosevelt Blvd	Bustleton	37780	33319	-4461	-11.81%
Red Lion Rd	Bustleton	Veree	28855	27861	-994	-3.45%
Red Lion Rd	Veree	Pine Rd.	17616	17739	123	0.70%
Red Lion Rd	Pine Rd.	Philmont	16485	16695	210	1.27%
Red Lion Rd	Philmont	PA 232	9990	9780	-210	-2.11%
Tomlinson Rd	Northeast Blvd.	Bustleton	5122	6138	1016	19.83%
Tomlinson Rd	Bustleton	Rennard	12454	11812	-643	-5.16%
Tomlinson Rd	Rennard	Philmont	10378	9837	-541	-5.22%
Tomlinson Rd	Philmont	Buck Rd.	3142	3112	-30	-0.96%
Rennard St	Bustleton	Tomlinson	5430	6117	687	12.66%
Southampton Rd.	US 1	Worthington	16718	14314	-2404	-14.38%
Southampton Rd.	Worthington	Trevose	7262	6194	-1068	-14.71%
County Line Rd.	Philmont	Bustleton	7329	6928	-401	-5.47%
County Line Rd.	Bustleton	Pine Rd.	21133	24555	3422	16.19%
County Line Rd.	Pine Rd.	N. Buck	26805	33467	6662	24.85%
County Line Rd.	Buck Rd.	PA 232	25916	30827	4911	18.95%
County Line Rd.	PA 232	New Rd	33973	37477	3504	10.31%
County Line Rd.	New Rd	Davisville Rd	34083	37172	3089	9.06%
Street Rd.	US 1	Trevose Rd.	51700	50195	-1505	-2.91%
Street Rd.	Philmont	Bustleton	39648	38262	-1387	-3.50%
Street Rd.	Bustleton	N. Buck Rd.	40067	40941	874	2.18%
Street Rd.	N. Buck Rd.	PA 232	40435	42353	1917	4.74%

Table A-6. 2026 No-Build and Modified Bustleton Alternative Average Daily Traffic Volumes (Continued)

Road	From	To	No-Build	Modified Bustleton Alternative	Diff.	% Diff.
Intersecting Roads						
Roosevelt Blvd	Grant Ave.	Red Lion	75610	78531	2921	3.86%
Roosevelt Blvd	Red Lion	Byberry	84327	87122	2795	3.31%
Roosevelt Blvd	Woodhaven Rd	Southampton	77580	74759	-2821	-3.64%
Roosevelt Blvd	Southampton	Old Lincoln Hwy	74577	74190	-387	-0.52%
Roosevelt Blvd	Street Rd.	PA Tpke	83312	83680	368	0.44%
Roosevelt Blvd	PA Tpke	Rockhill Rd.	79133	79226	93	0.12%
Evans St.	Byberry Rd	Woodhaven Rd	27992	7204	-	-
Northeast Ave	Red Lion Rd	Tomlinson	11549	11731	182	1.58%
Northeast Ave	Tomlinson	Byberry	10942	12069	1127	10.30%
Northeast Ave	Byberry East	Byberry West	-	12972		
Worthington Rd	Byberry	Southampton	4950	6036	1086	21.94%
Trevose Rd	Bustleton	Southampton	7109	8778	1669	23.48%
Veree Rd	Red Lion	Bustleton	13649	15000	1351	9.90%
Pine Rd.	Red Lion	Tomlinson	12075	13306	1231	10.20%
Pine Rd.	Tomlinson	Byberry	10563	12767	2204	20.87%
Pine Rd.	Byberry	County Line Rd.	10392	13577	3186	30.66%
Buck Rd.	Tomlinson	Byberry	6577	7561	984	14.95%
Buck Rd.	Byberry	County Line Rd.	5147	7509	2362	45.90%
Buck Rd.	County Line Rd.	Street Rd.	7070	8880	1810	25.60%
PA 232	Red Lion	Tomlinson	20084	19497	-587	-2.92%
PA 232	Tomlinson	Byberry	22308	22248	-59	-0.27%
PA 232	Byberry	County Line Rd.	20794	21427	633	3.04%
PA 232	County Line Rd.	Street Rd.	22706	22673	-32	-0.14%
New Rd	Rose Valley Rd	County Line Rd	5199	5026	-173	-3.33%
New Links						
Woodhaven Expressway	US 1	Evans St.	-	47691	-	-
Woodhaven Expressway	Bustleton	Evans St.	-	45618	-	-
Woodhaven Expressway	Bustleton	Philmont	-	23428	-	-
Woodhaven Expressway	Philmont	Byberry	-	16425	-	-
Evans St. Ramp	Woodhaven Rd.	Byberry	-	7204	-	-

APPENDIX B

Detailed Traffic Turning Movement Counts

Figure B-1: Existing - Byberry Road Corridor

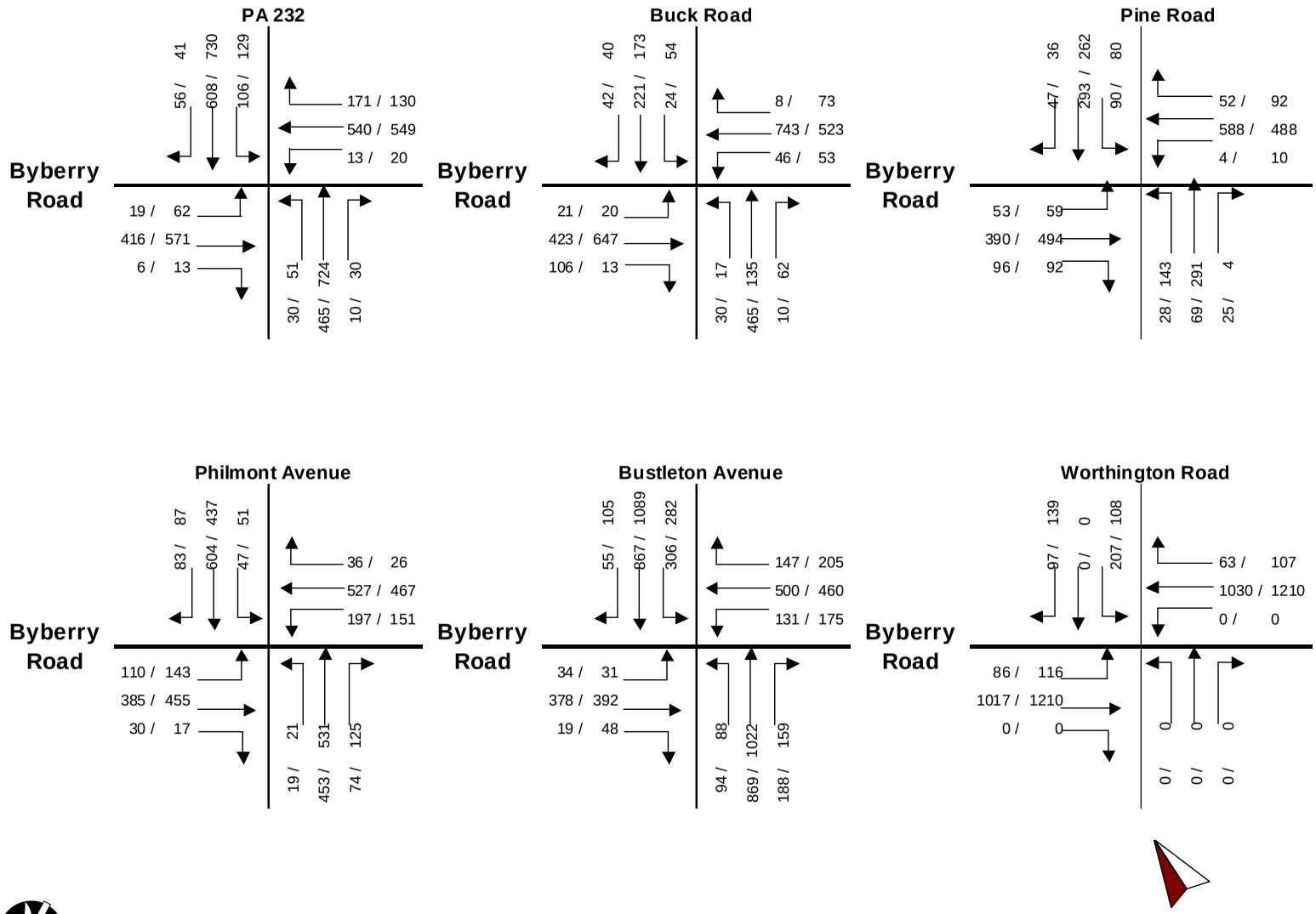
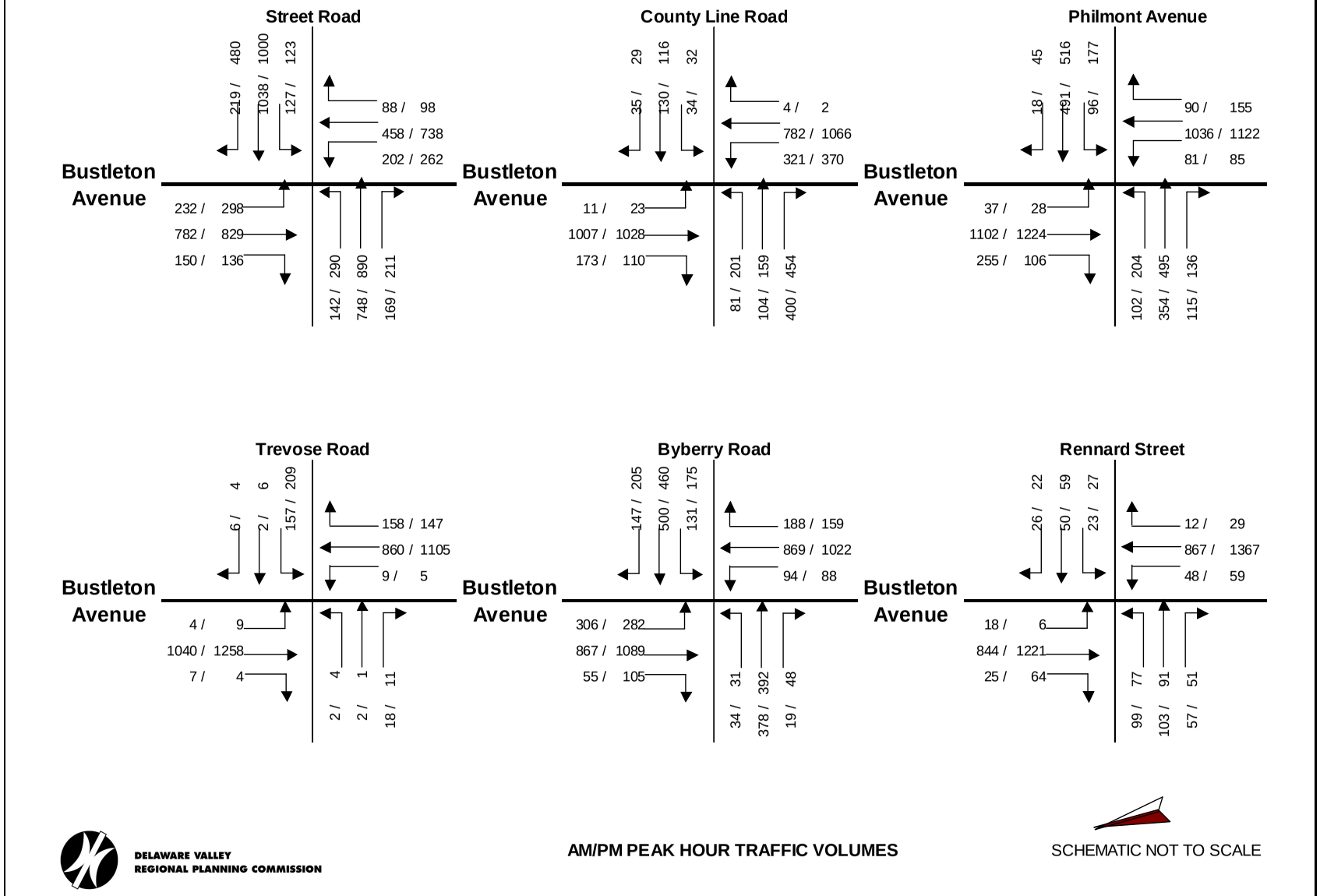


Figure B-2: Existing - Bustleton Avenue Corridor

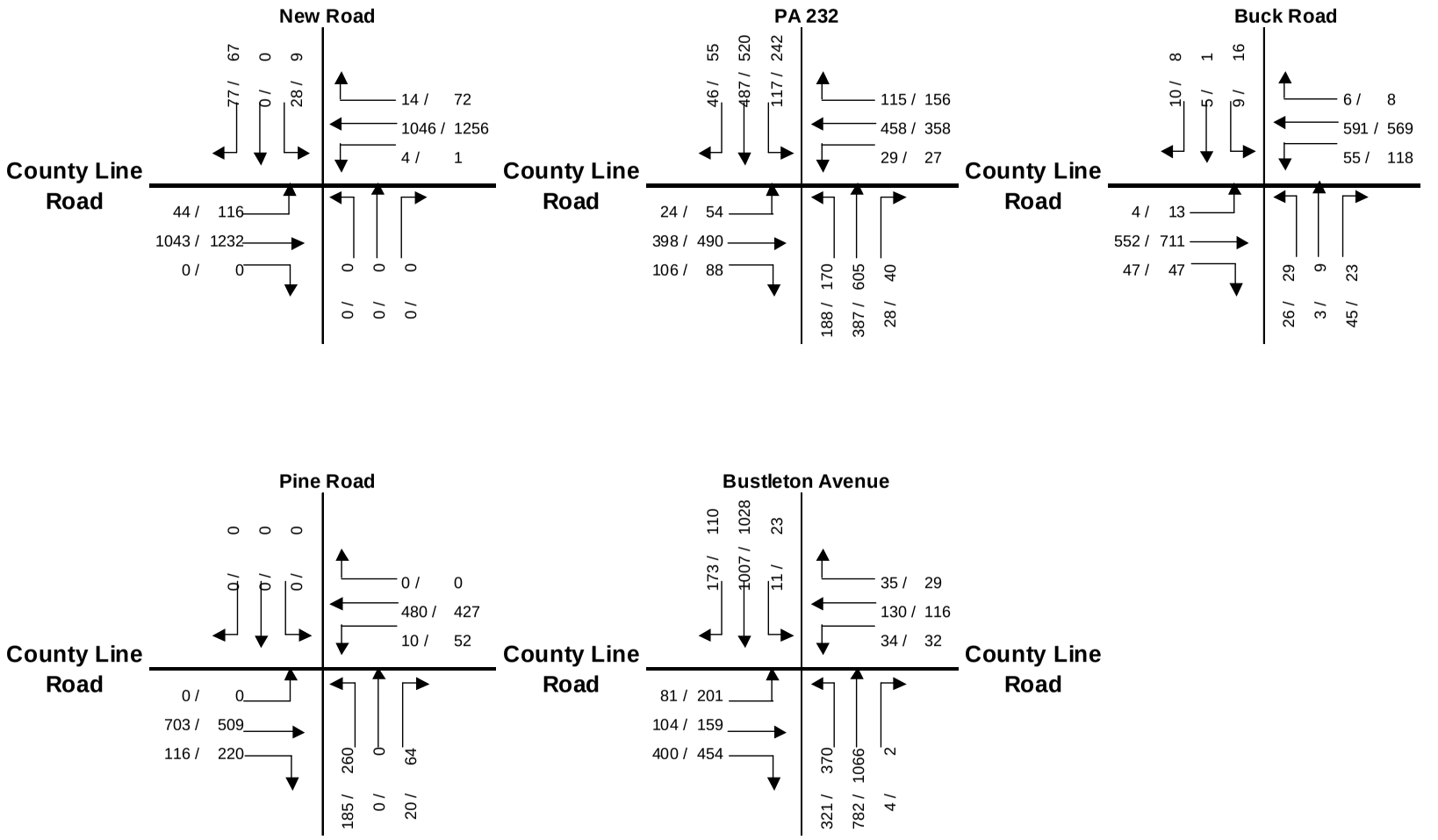


DELAWARE VALLEY
REGIONAL PLANNING COMMISSION

AM/PM PEAK HOUR TRAFFIC VOLUMES

SCHEMATIC NOT TO SCALE

Figure B-3: Existing - County Line Road Corridor



DELAWARE VALLEY
REGIONAL PLANNING COMMISSION

AM/PM PEAK HOUR TRAFFIC VOLUMES

SCHEMATIC NOT TO SCALE

Figure B-4: No-Build - Byberry Road Corridor

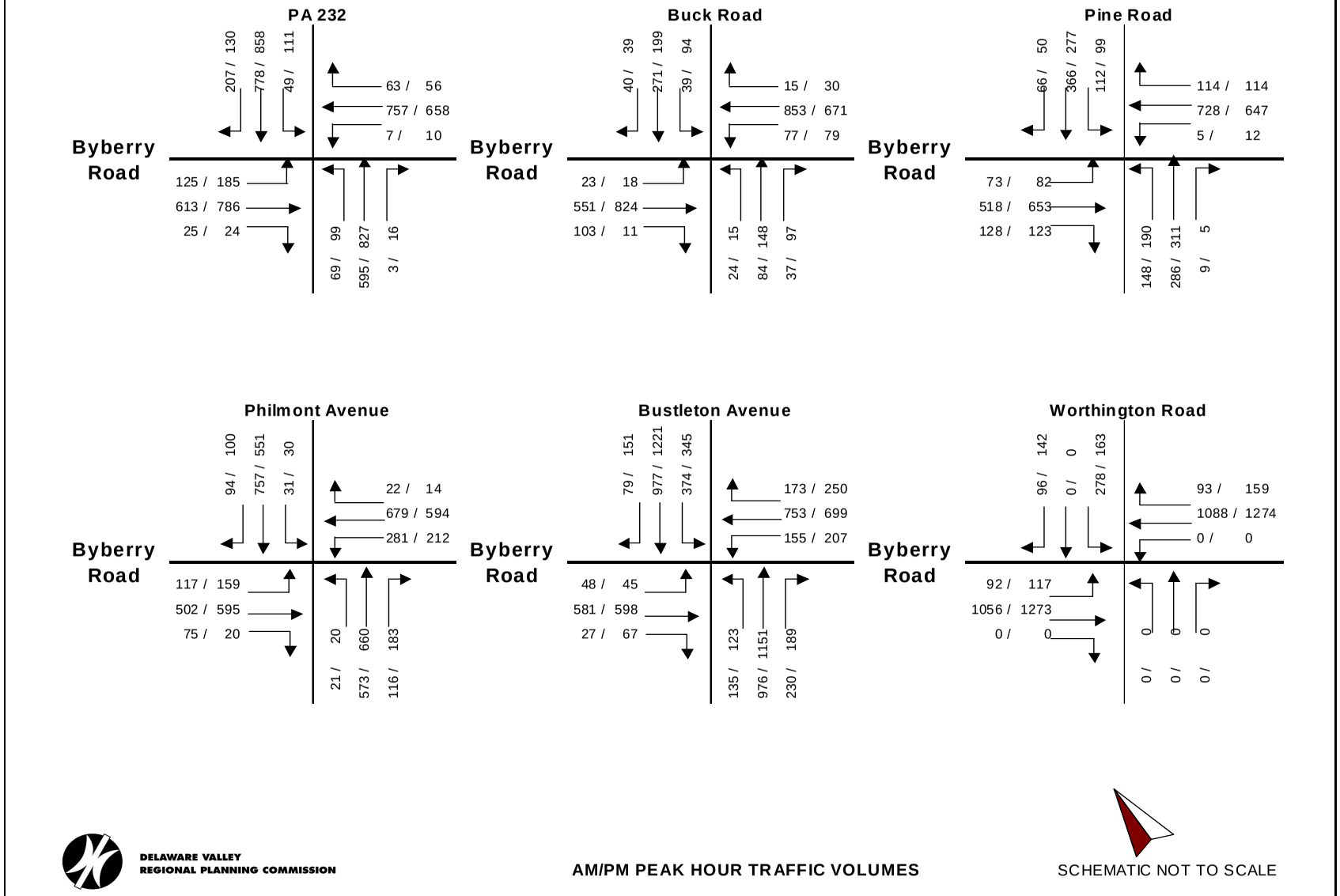


Figure B-5: No-Build - Bustleton Avenue Corridor

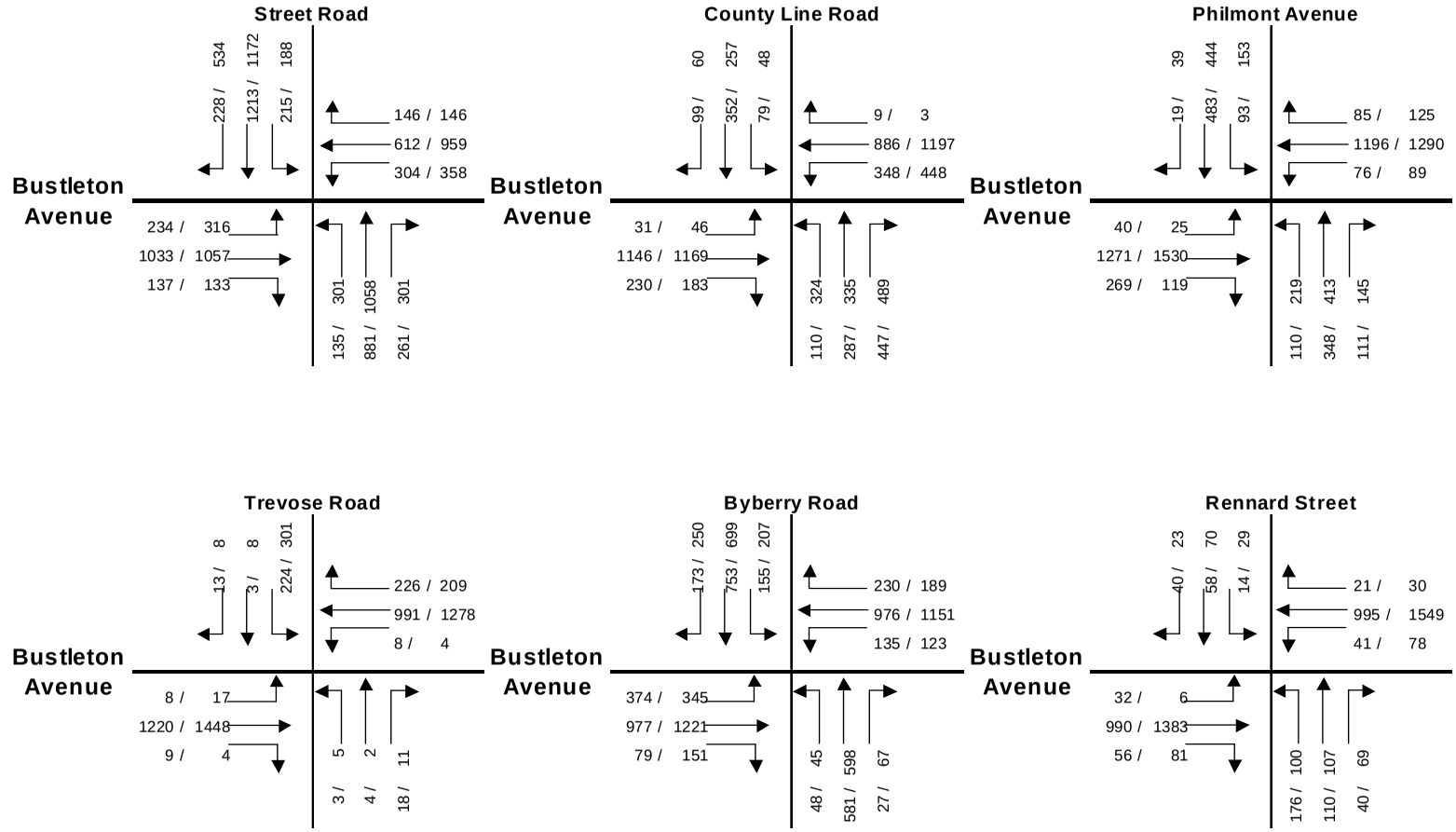


Figure B-6: No-Build - County Line Road Corridor

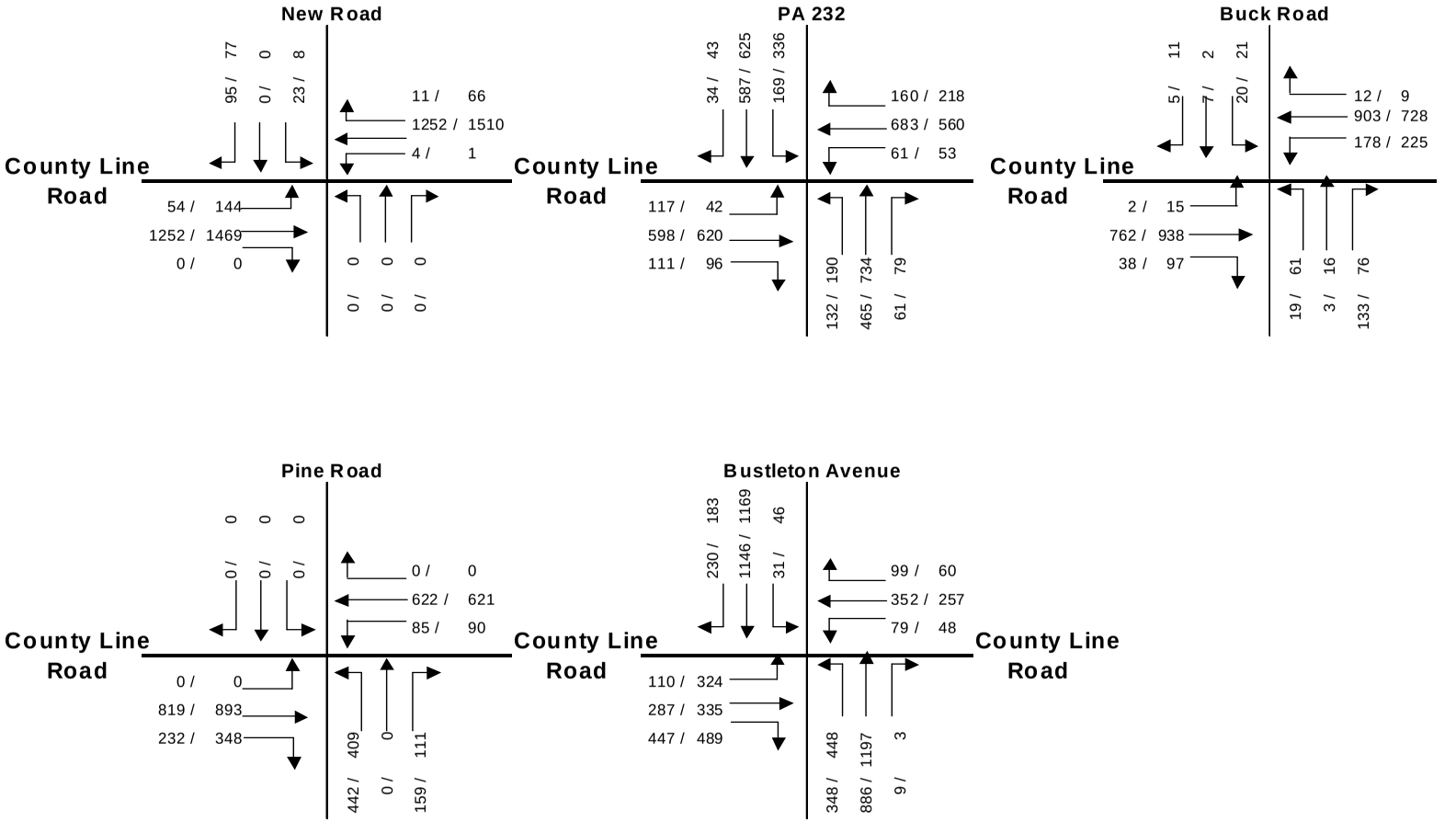


Figure B-7: Bustleton Alternative - Byberry Road Corridor

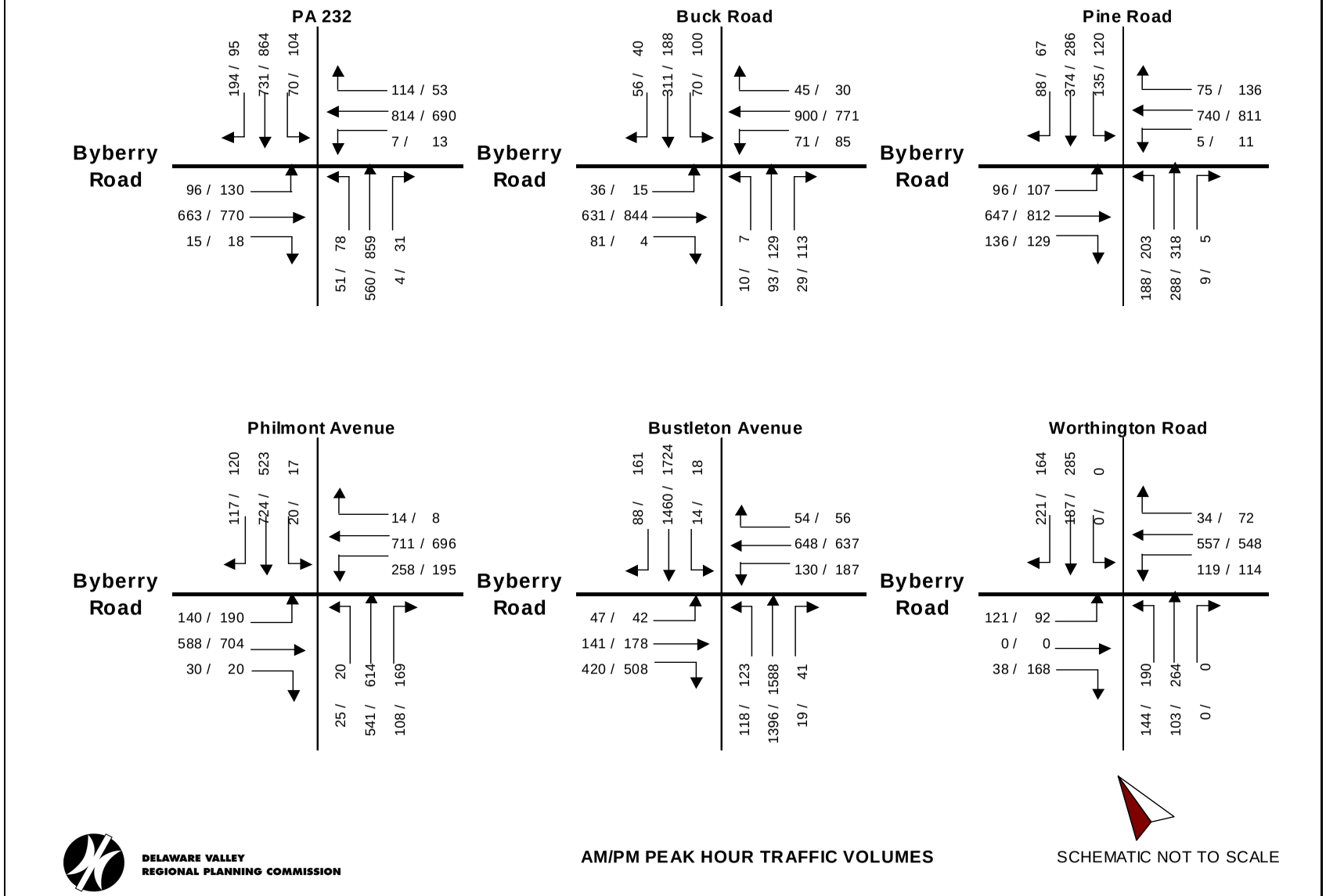
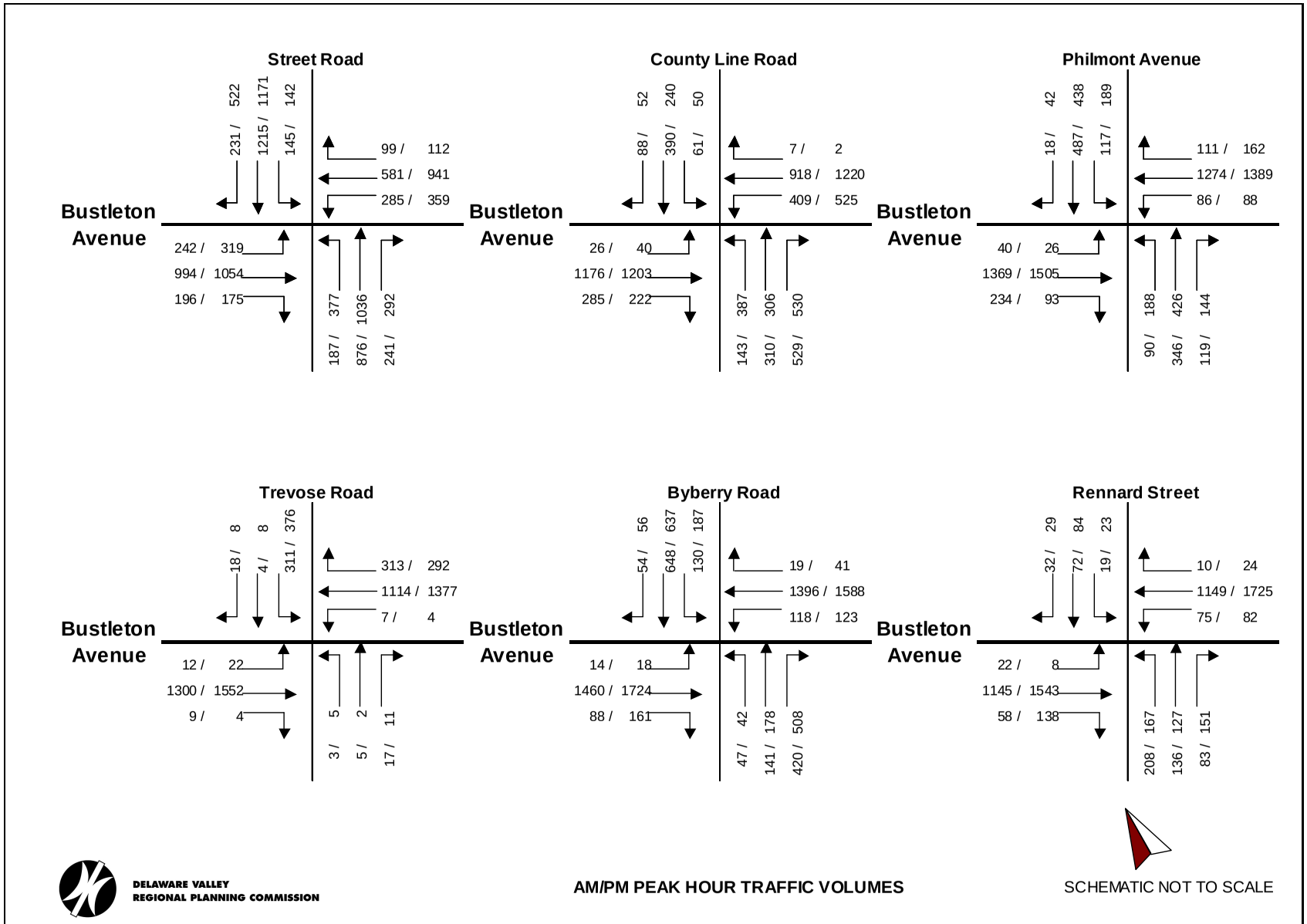


Figure B-8: Bustleton Alternative - Bustleton Avenue Corridor



DELAWARE VALLEY
REGIONAL PLANNING COMMISSION

AM/PM PEAK HOUR TRAFFIC VOLUMES

SCHEMATIC NOT TO SCALE

Figure B-9: Bustleton Alternative - County Line Road Corridor

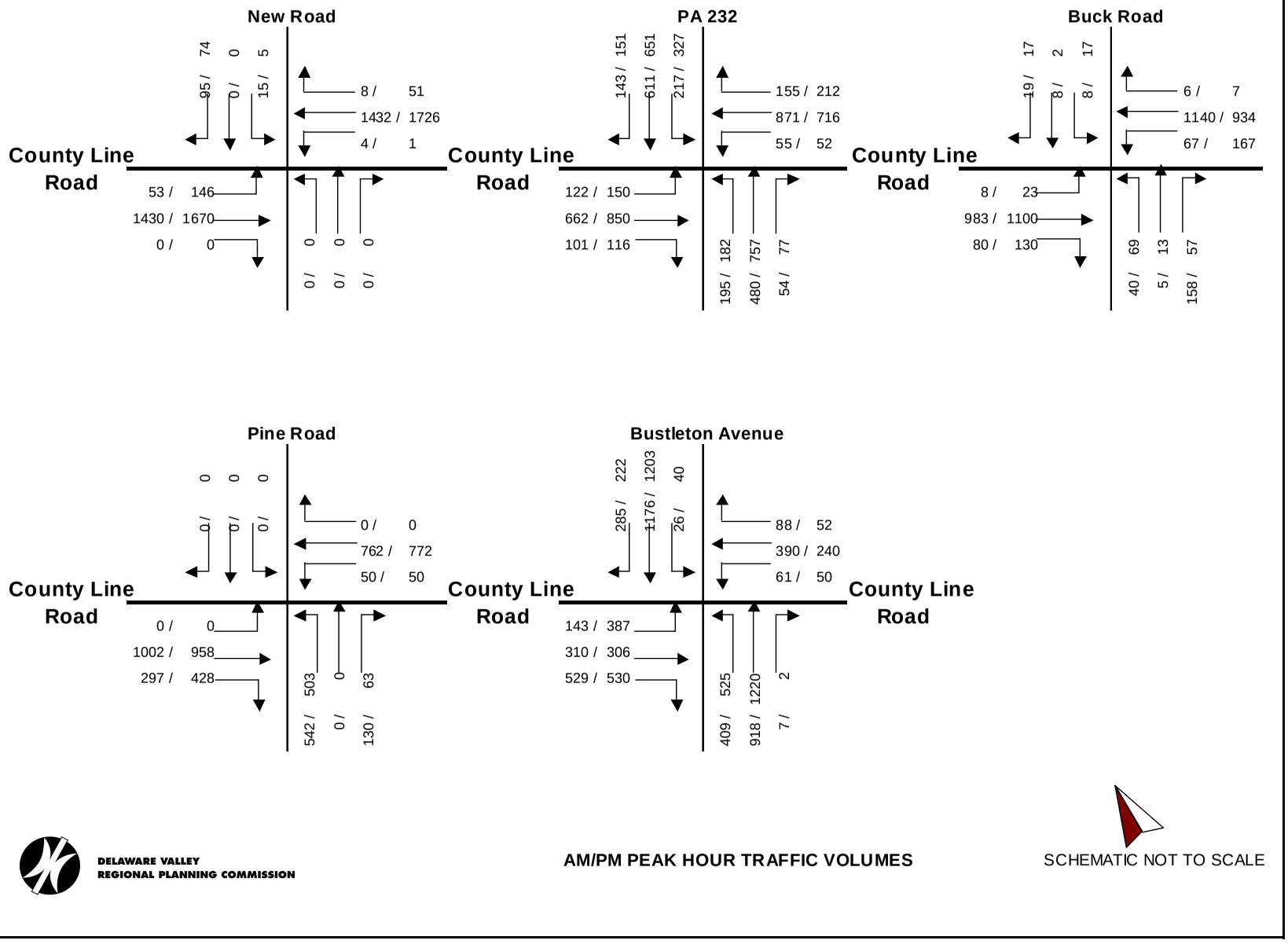
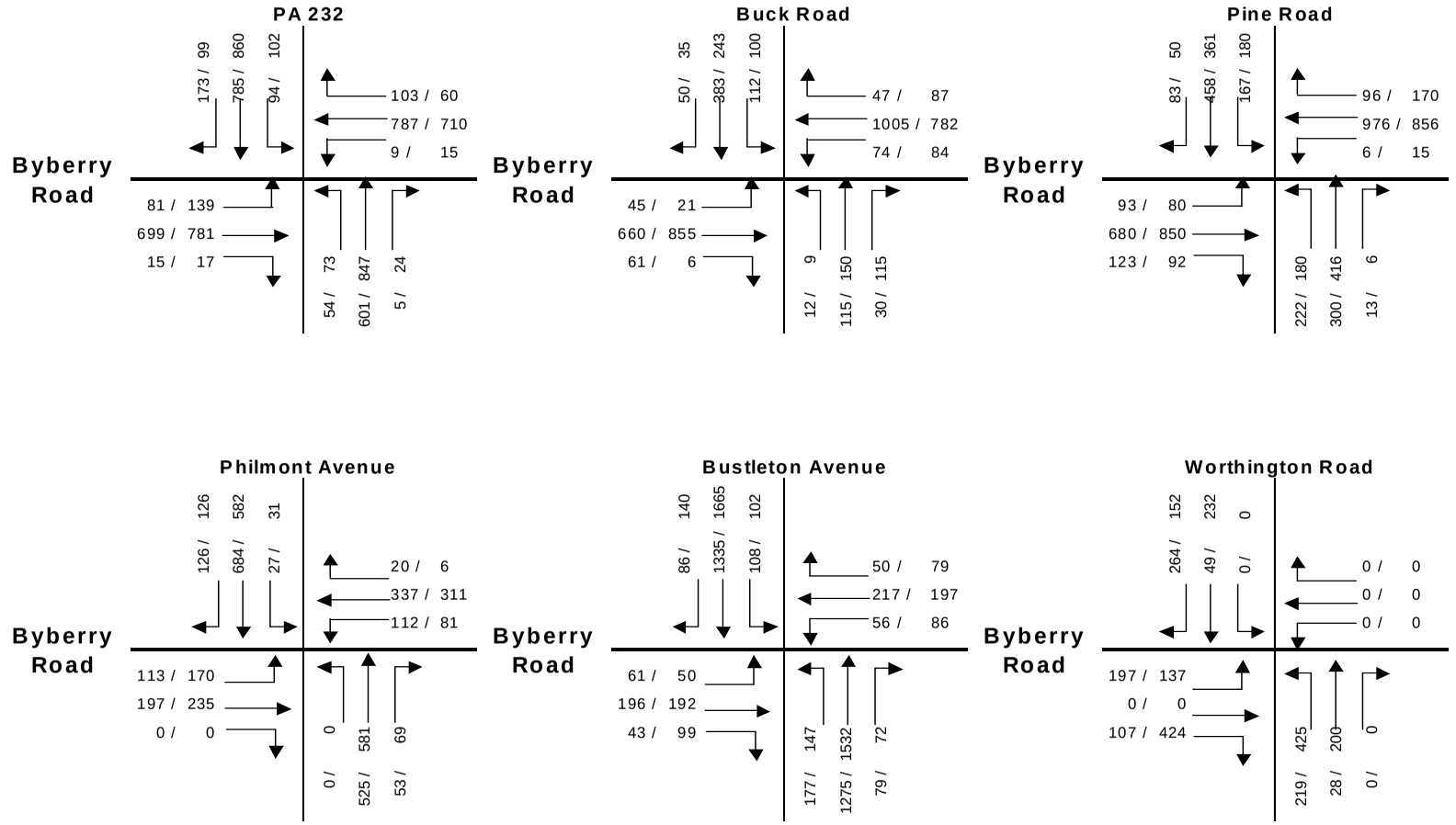


Figure B-10: Bustleton Modified - Byberry Road Corridor

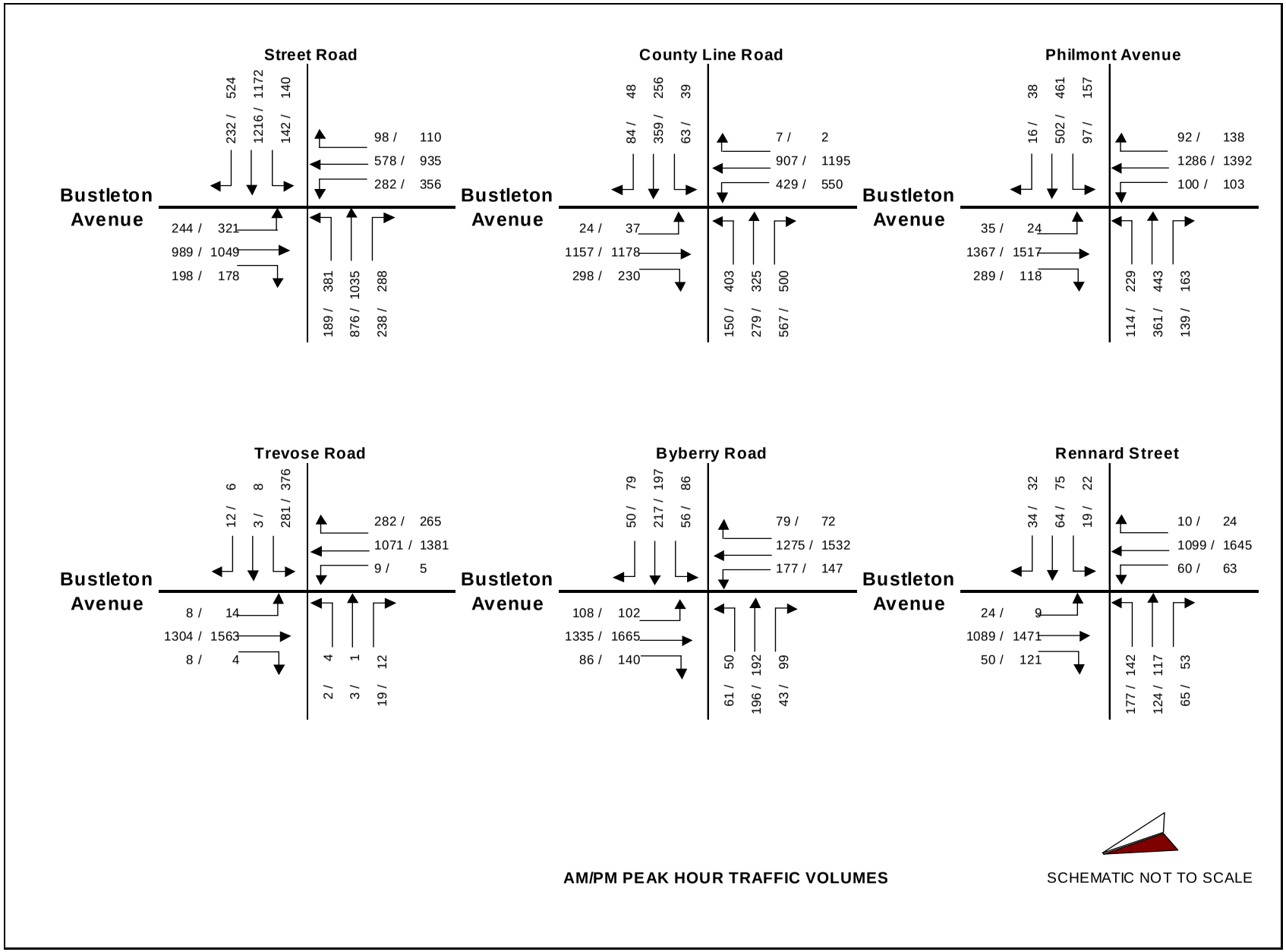


DELAWARE VALLEY
REGIONAL PLANNING COMMISSION

AM/PM PEAK HOUR TRAFFIC VOLUMES

SCHEMATIC NOT TO SCALE

Figure B-11: Bustleton Modified - Bustleton Avenue Corridor



AM/PM PEAK HOUR TRAFFIC VOLUMES

SCHEMATIC NOT TO SCALE

Figure B-12: Bustleton Modified - County Line Road Corridor

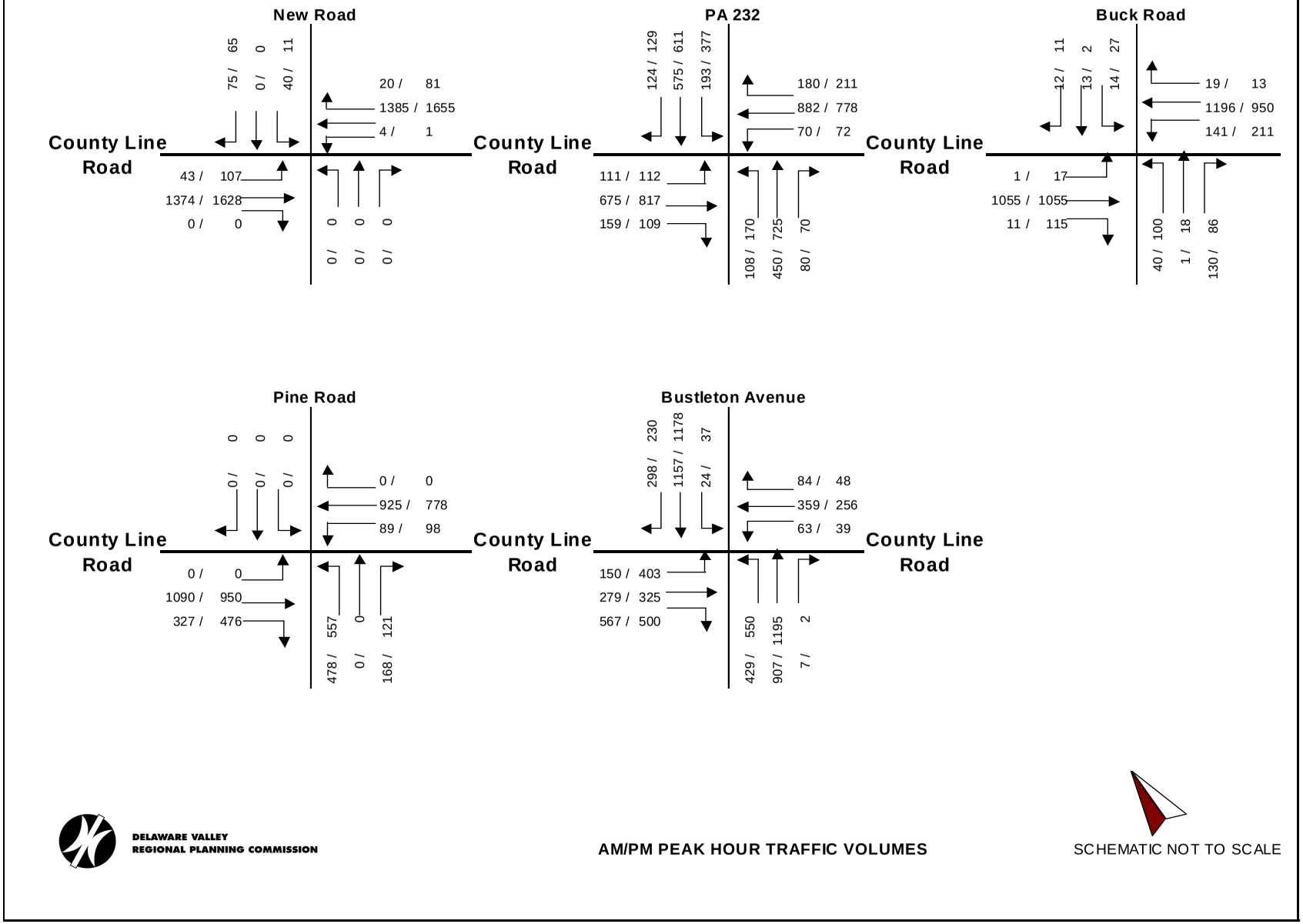


Figure B-13: Byberry Upgrade - Byberry Road Corridor

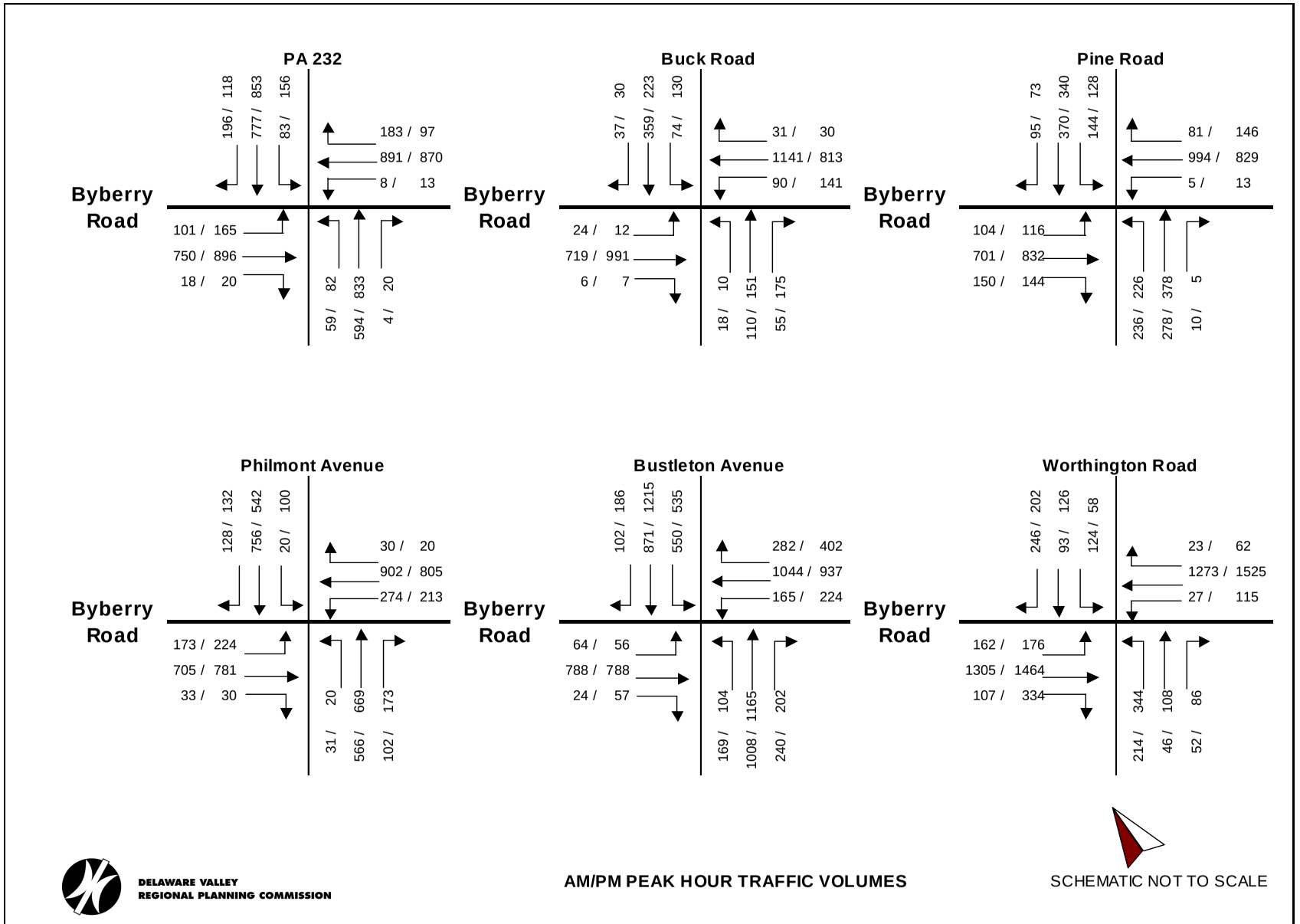


Figure B-14: Byberry Upgrade - Bustleton Avenue Corridor

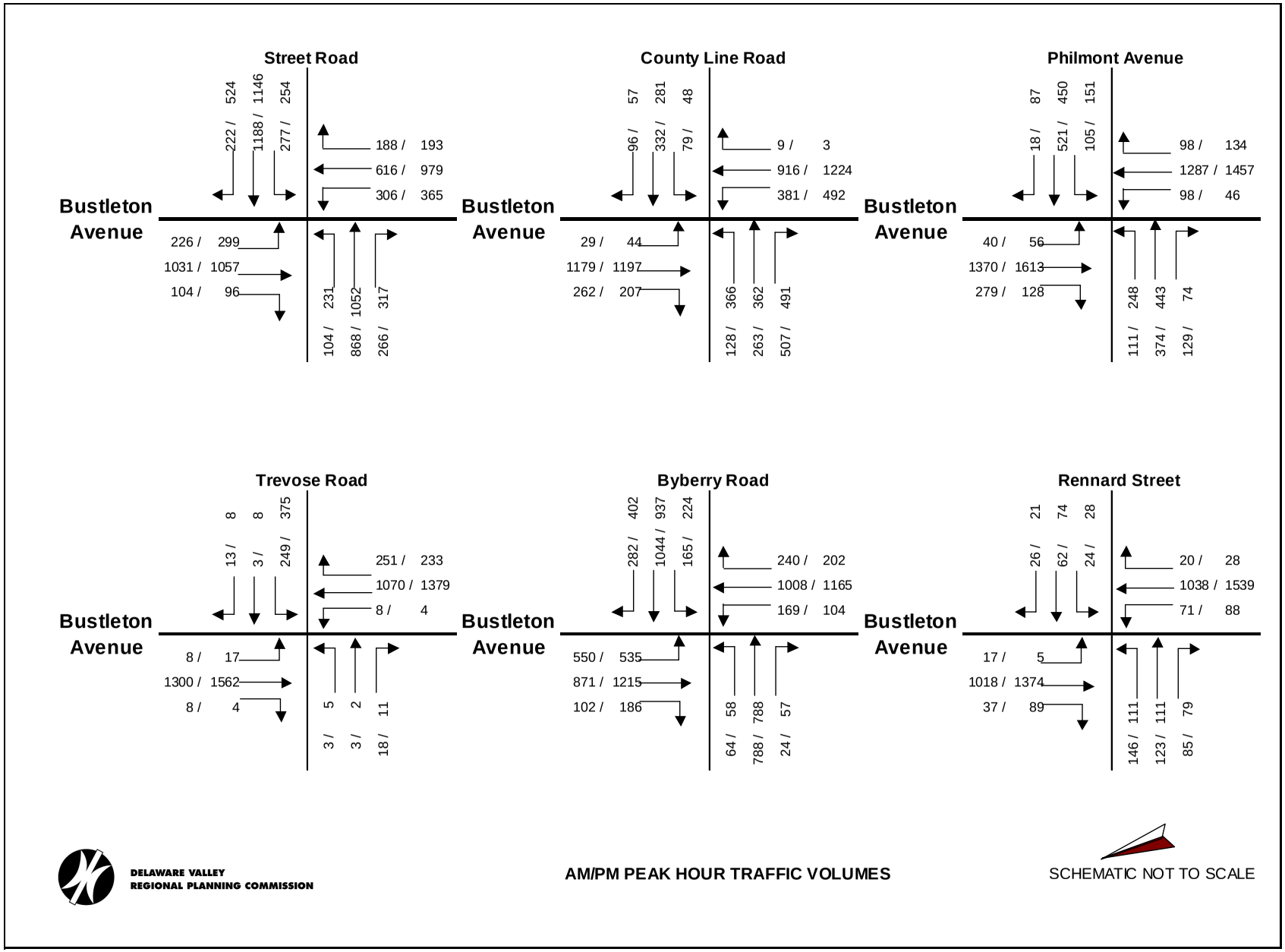


Figure B-15: Byberry Upgrade - County Line Road Corridor

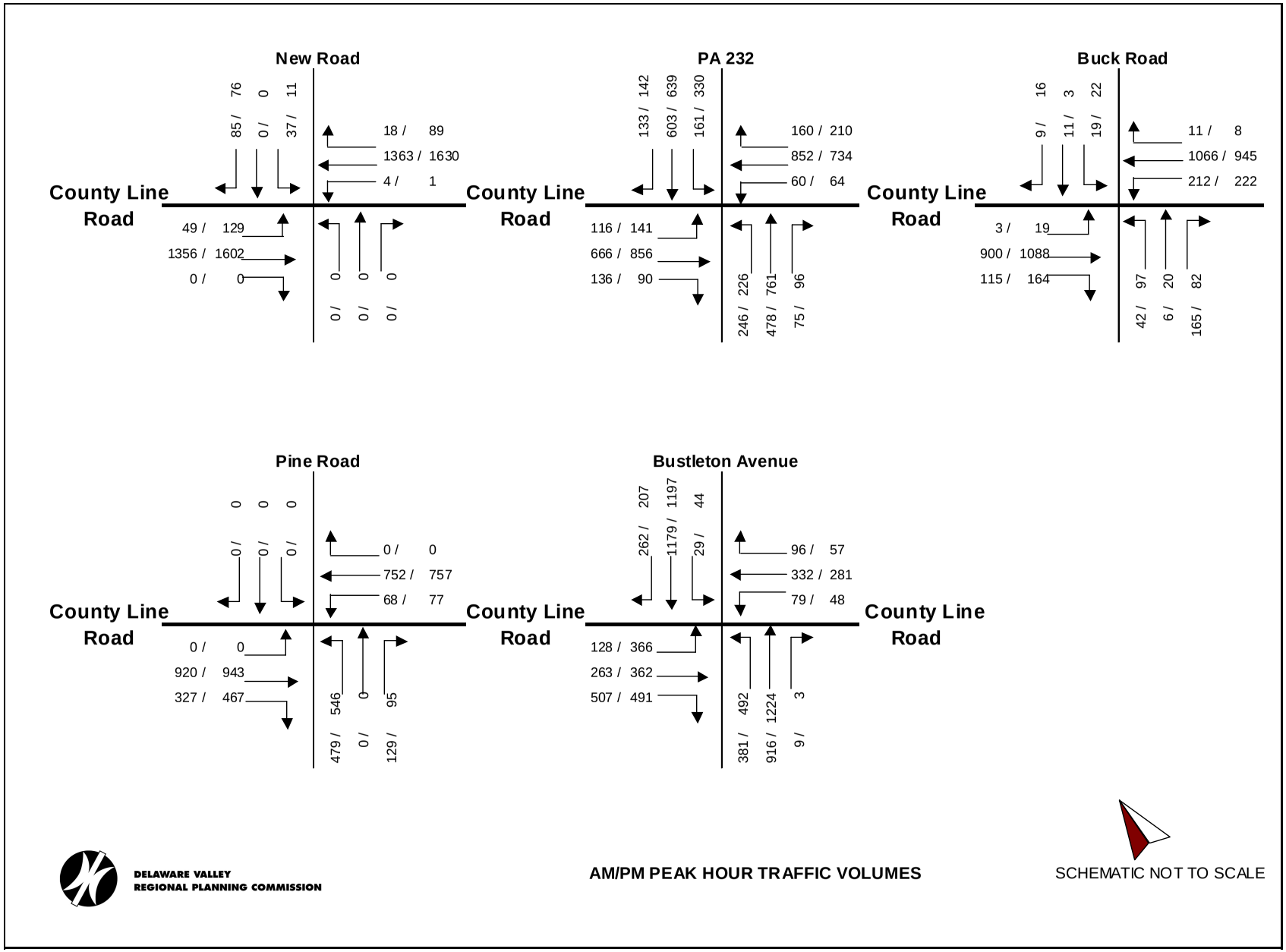


Figure B-16: Woodhaven Extension - Byberry Road Corridor

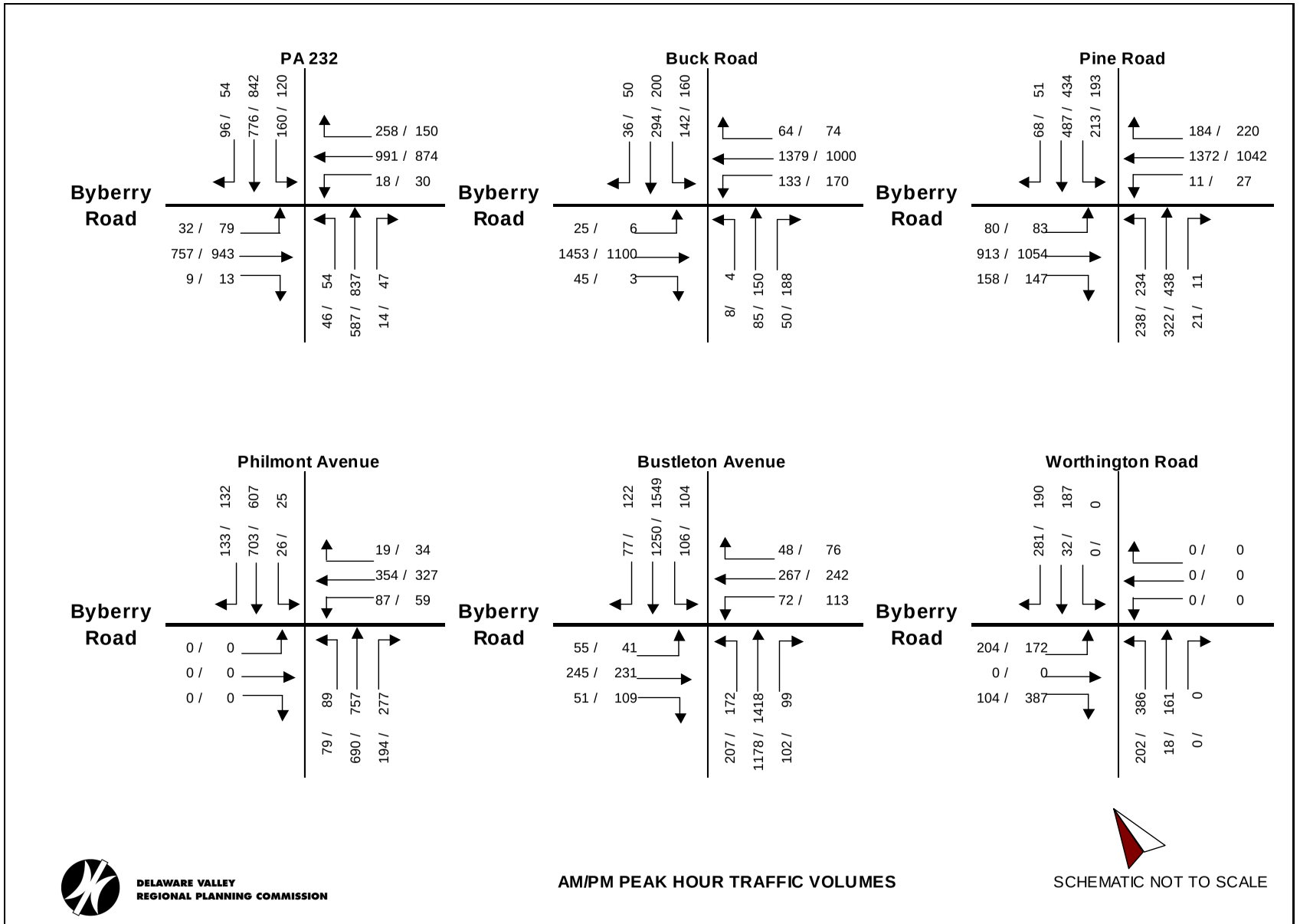


Figure B-17: Woodhaven Extension - Bustleton Avenue Corridor

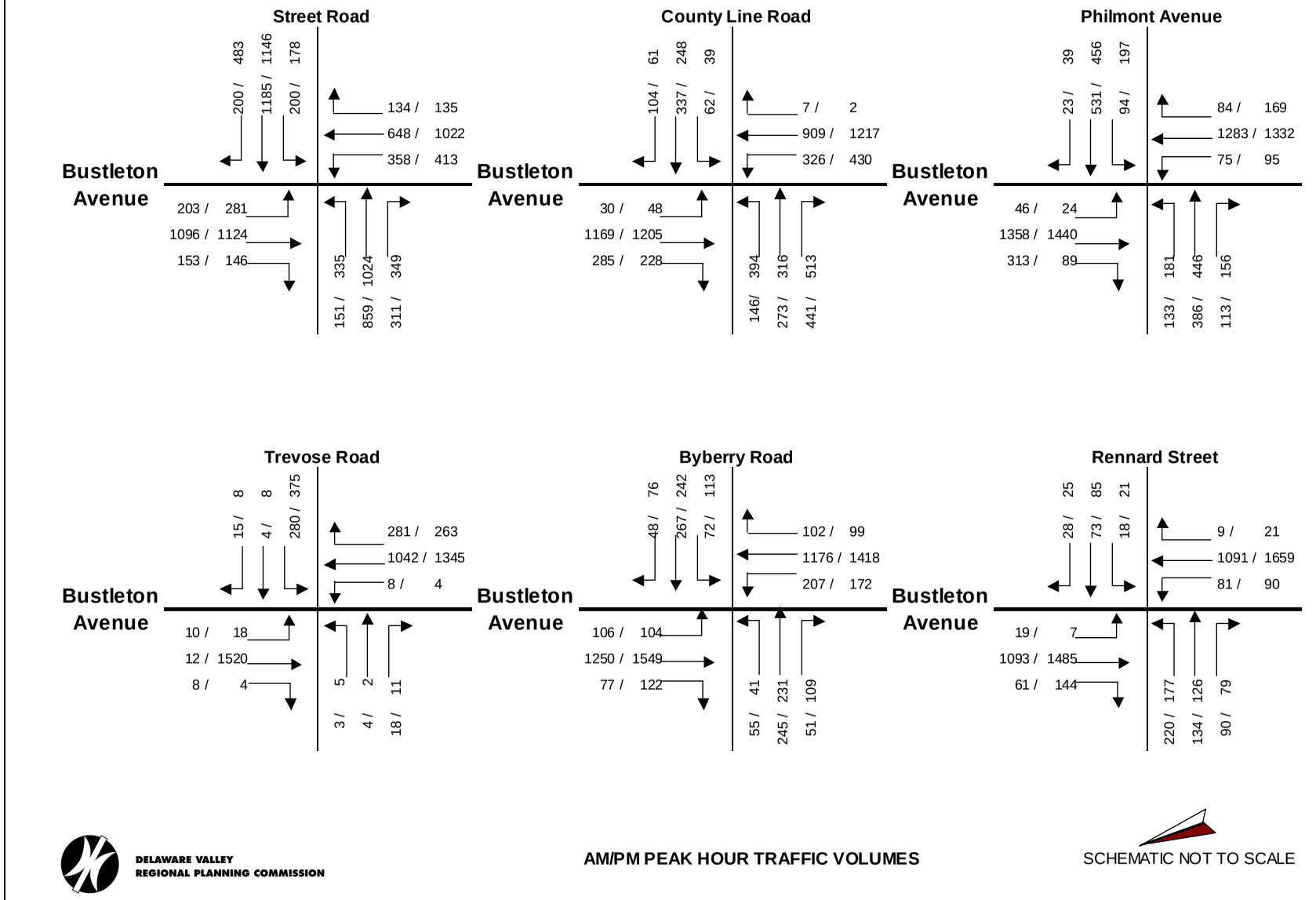


Figure B-18: Woodhaven Extension - County Line Road Corridor

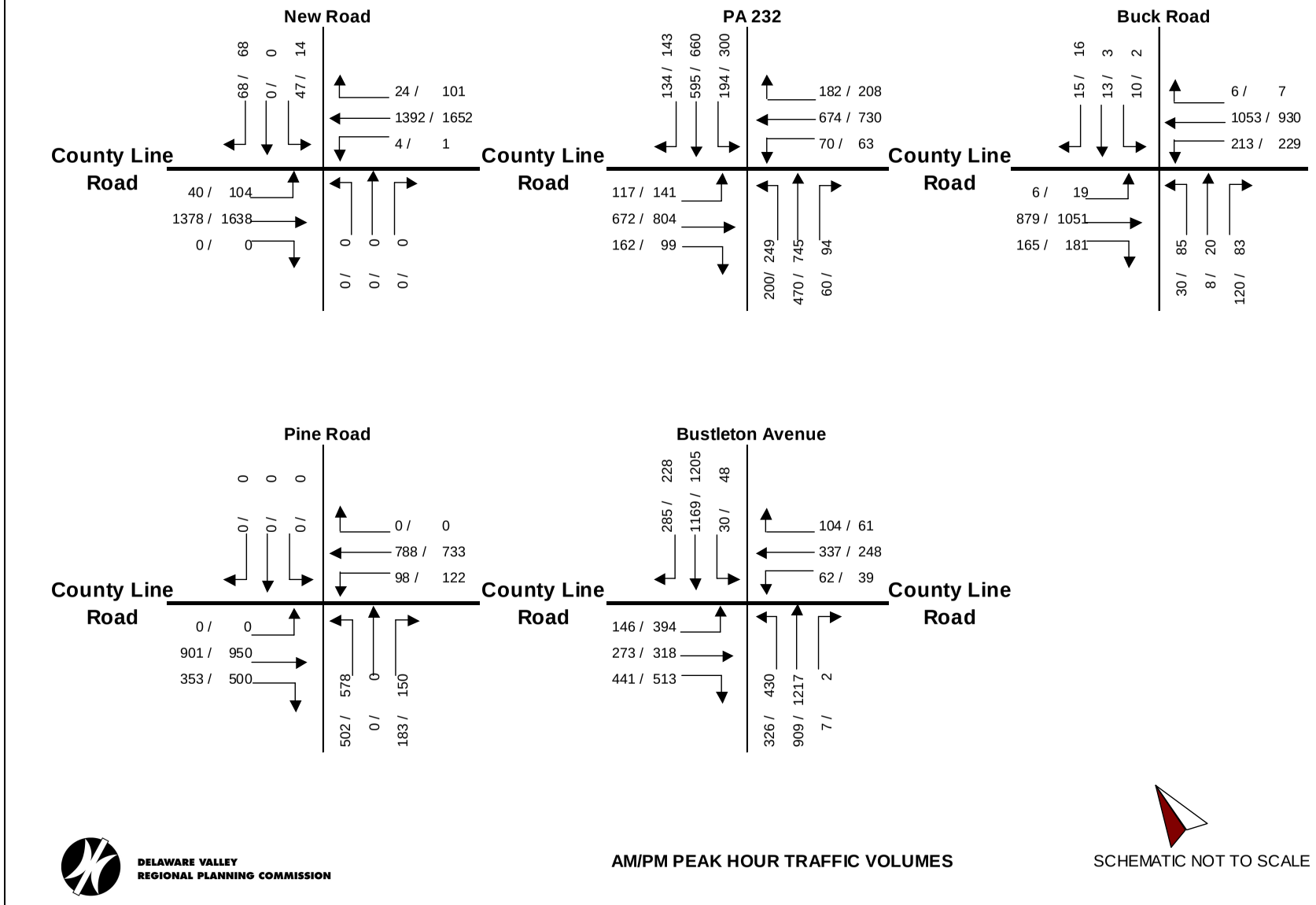


Figure B-19: Woodhaven Modified - Byberry Road Corridor

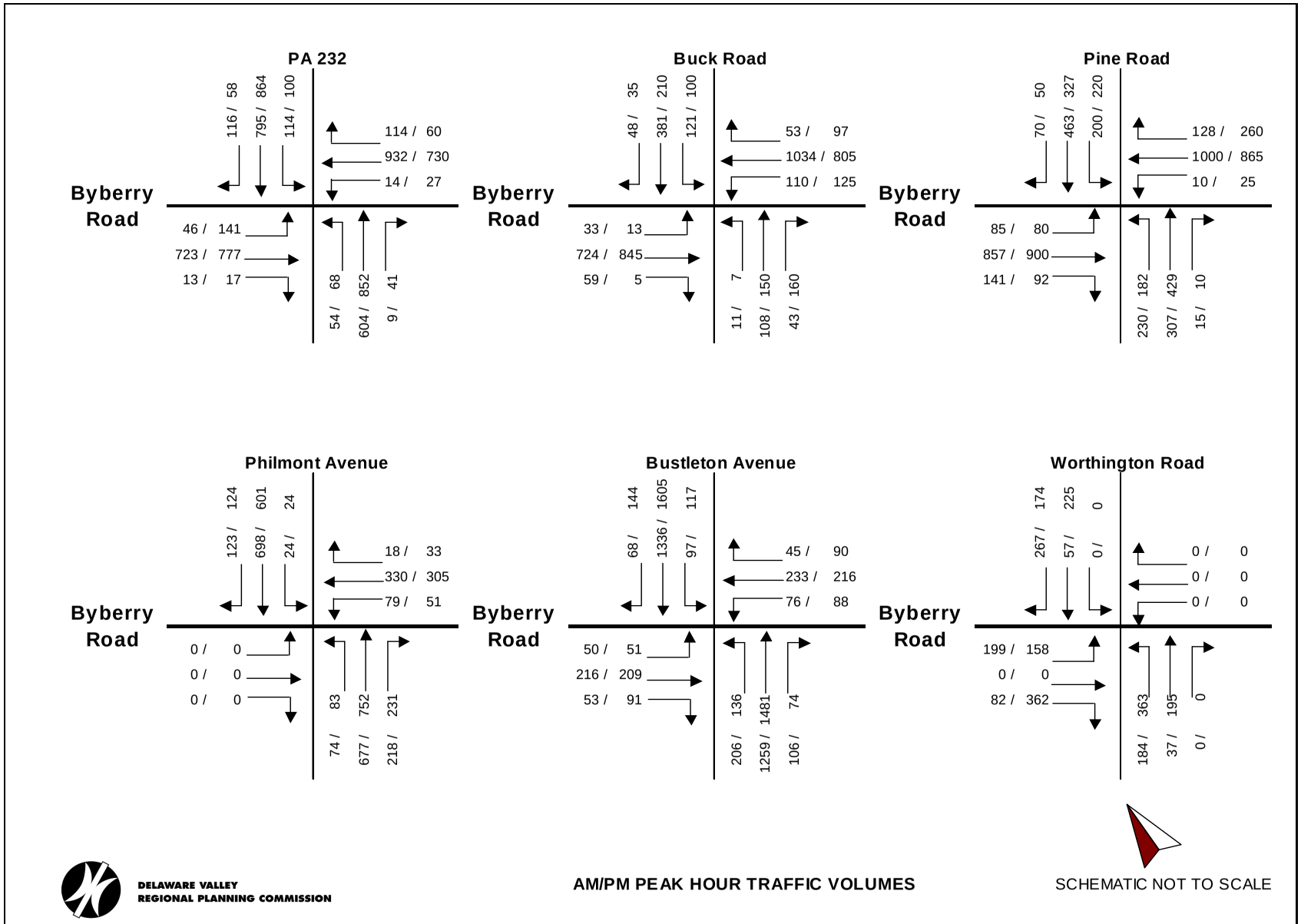


Figure B-20: Woodhaven Modified - Bustleton Avenue Corridor

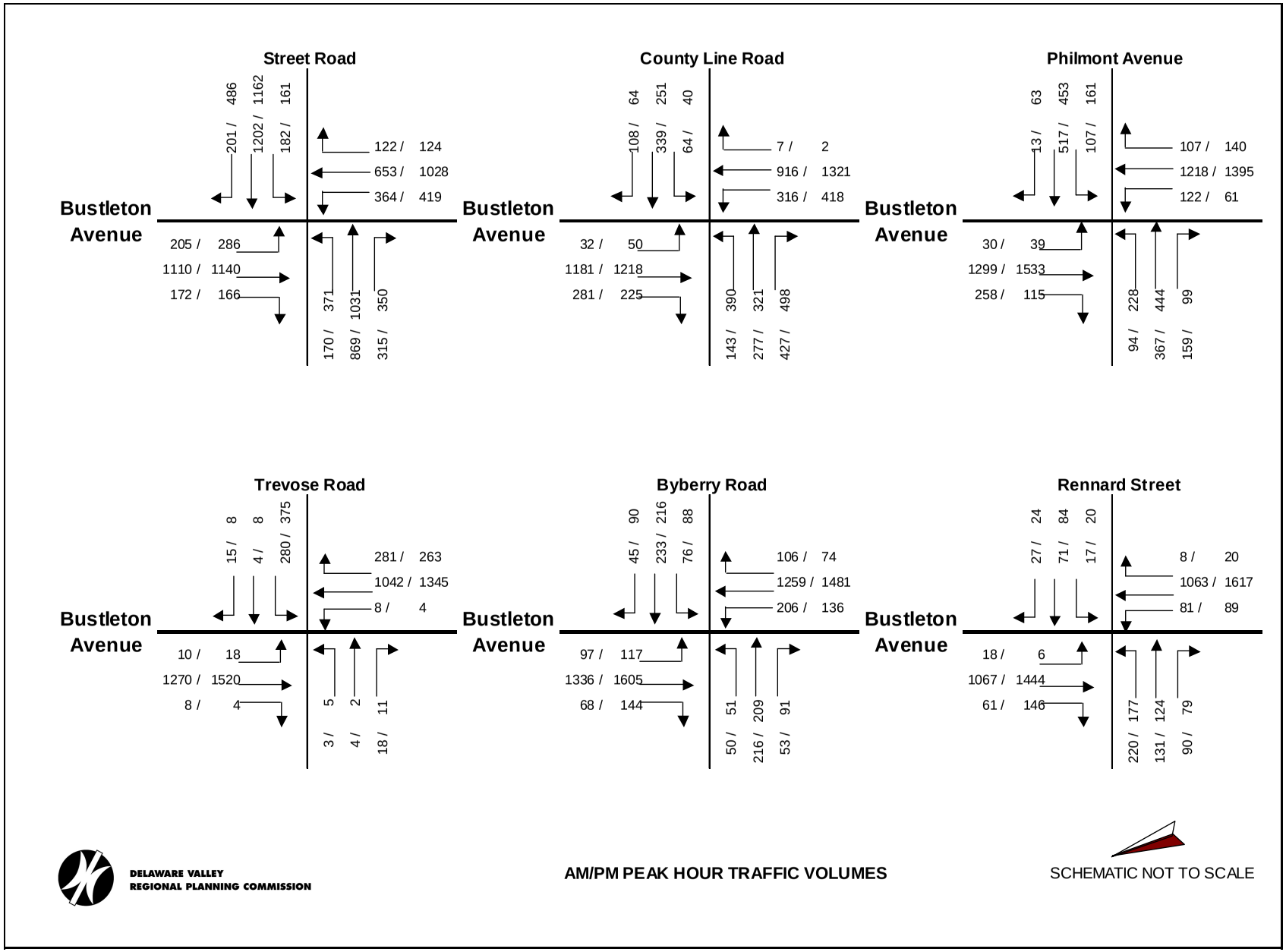
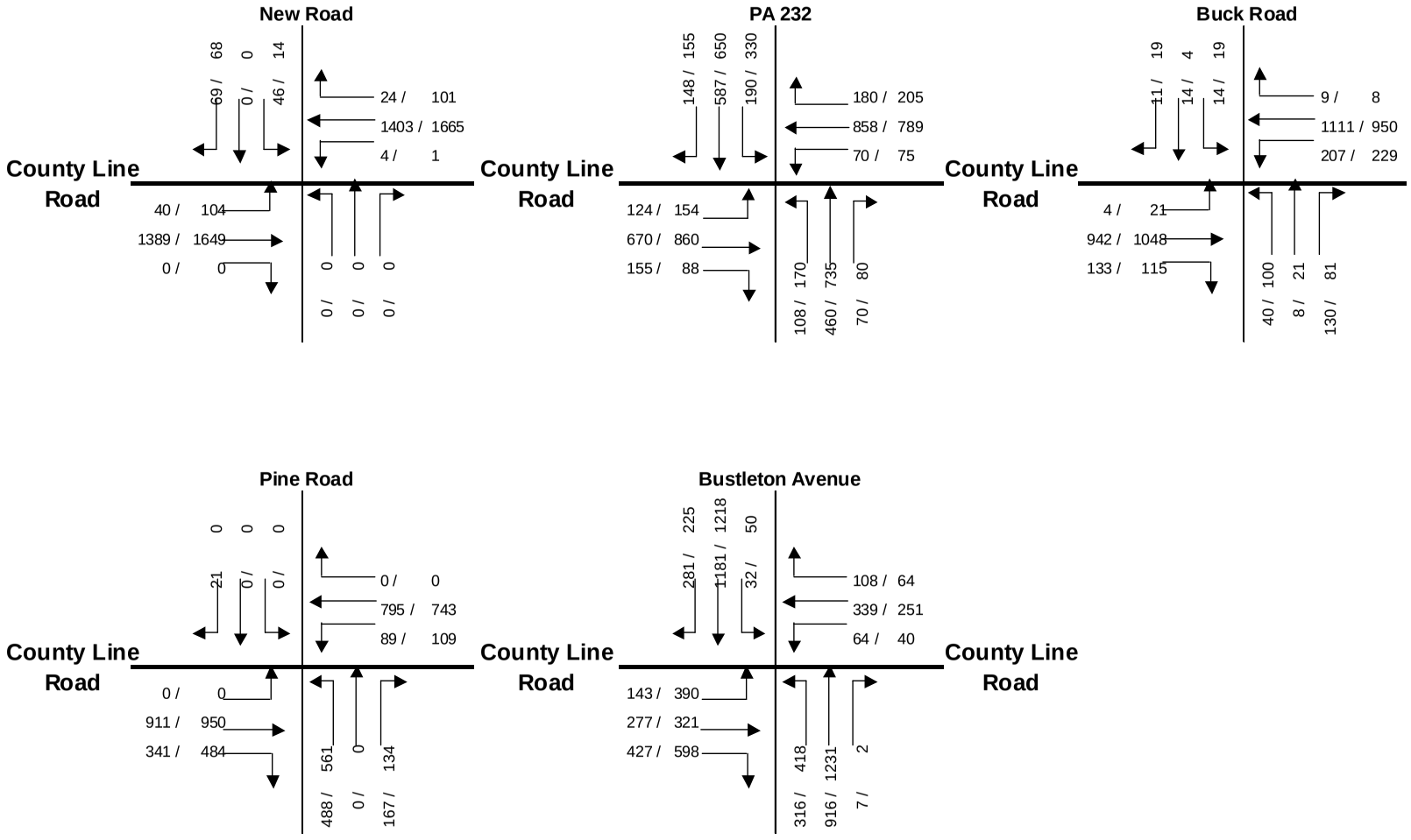


Figure B-21: Woodhaven Modified - County Line Road Corridor



Woodhaven Road Traffic Study - Bucks, Philadelphia & Montgomery Counties, PA

Publication No. : 02011

Date Published: June 2002

Geographic Area Covered: Northeast Philadelphia (Somerton Section) and Lower Moreland Township in Montgomery County and Lower Southampton Township Bucks County in Pennsylvania.

Key Words: Highway Network, Traffic Simulation, Traffic Demand, Forecasting Alternative Analysis, Traffic Volumes, Peak Hour Turning Movements, Design Factors, Land Use, Air Quality, Vehicle Miles of Travel.

ABSTRACT

This report present updated traffic counts and socio-economic data necessary to prepare 2026 forecasts for the no-build and 5 build alternatives for the Woodhaven Road study area. It was prepared at the request of the Pennsylvania Department of Transportation who is conducting a final environmental impact study for Woodhaven Road. DVRPC regional travel simulation model was used to estimate future traffic volumes for five alternatives. These alternatives included: Byberry Road Upgrade, Woodhaven Extension, Modified Woodhaven Extension, Bustleton Avenue, and Modified Bustleton Avenue.

Delaware Valley Regional Planning Commission
8th Floor - The Bourse Building
111 South Independence Mall East
Philadelphia, PA 19106-2582

Phone: 215-592-1800
Fax: 215-592-9125
Internet: www.dvrpc.org

Staff contact: John J. Coscia Jr.
Direct phone: 215-238-2859
E-mail: jcosciajr@dvrpc.org