NEW GARDEN TOWNSHIP

Bowman

Pennsylvania Act 209 Roadway Sufficiency Analysis

New Garden Township, Chester County, PA

Prepared by

Bowman Consulting Group, Ltd.

835 Springdale Drive, Suite 200

Exton, PA 19341

610.594.9995

Prepared for

New Garden Township

DRAFT REPORT FOR PUBLIC REVIEW PRIOR TO ADOPTION BY THE NEW GARDEN TOWNSHIP BOARD OF SUPERVISORS

May 14, 2025

Bowman Project Number: 313674-01-001

TABLE OF CONTENTS

LIST OF APPENDICIES

Introduction

Overview

This Roadway Sufficiency Analysis has been prepared in accordance with the requirements set forth in Pennsylvania Act 209 on behalf of New Garden Township, Chester County, Pennsylvania. Pennsylvania Act 209 was signed into law effective December 19, 1990. It amends the Pennsylvania Municipalities Code (Act 247 of 1968, as amended) to permit municipalities to assess transportation impact fees on new development within their boundaries, provided that they have adopted a municipal transportation impact fee ordinance in accordance with the procedures set forth in the Act. In 2002, Act 68 further modified the Pennsylvania Municipalities Code to add additional provisions and clarify existing provisions of the law.

Impact fees under Act 209 may only be used for those costs incurred for improvements designated in the adopted transportation capital improvements plan of the municipality that are attributable to new development except under certain circumstances that are defined by the legislation (Section 505-A(d)). The impact fees cannot be used for municipal, non-transportation-related capital improvements; for the repair, maintenance, or operation of existing or new municipal transportation capital improvements; or for the upgrade or replacement of existing municipal transportation capital improvements due to operational or safety deficiencies not related to new development. The Act specifically and only applies to off-site transportation capital improvements attributable to new development; it neither applies to, nor restricts the procedures or powers of the municipality to require on-site transportation improvements to remedy impacts of new development, nor is it intended to replace the municipality's ordinance requirements for submission of traffic impact studies.

All appendices supporting the Roadway Sufficiency Analysis referred to in this report are contained in a separate bound document entitled, Pennsylvania Act 209 Transportation Impact Fee Study Technical Appendices, New Garden Township, Chester County, dated July____, 2025.

Process

The process that New Garden Township has undertaken includes the completion of the necessary milestones pursuant to the Act 209 legislation, as follows:

1. Appointment of a Transportation Impact Fee Advisory Committee (TIFAC) and designation of the geographic area of the municipality that will be subject to the transportation impact fee ordinance. The meeting minutes of the Transportation Impact fee Advisory Committee are included in **Appendix A**.

2. Development and adoption of a Land Use Assumptions Report within the Township and the designated geographic area, the Transportation Service Area (TSA), which together with existing development are the subject of a Roadway Sufficiency Analysis and creation of a Transportation Capital Improvement Plan.

3. Completion and approval of a Roadway Sufficiency Analysis for the Transportation Service Area, identifying traffic deficiencies and needed improvements attributable to existing traffic, future traffic not originating from within the service area (i.e., pass-through traffic), and future traffic originating from new development within the service area for a preferred level of service in terms of desired traffic operations during the designated peak hour of study.

4. Adoption of a Transportation Capital Improvement Plan, including costs, implementation priorities, and funding sources, specifically and separately addressing improvements required to remedy:

a. current traffic deficiencies resulting from **existing** traffic volumes and capacity limitations;

b. traffic deficiencies attributable to future **pass-through** traffic after existing deficiencies have been remedied; and

c. traffic deficiencies attributable to expected **new development** within the service area after pass-through traffic and after existing deficiencies have been remedied.

5. Adoption of a Transportation Impact Fee Ordinance based on the total cost of identified transportation improvements attributable to **new development** within the Transportation Service Area to be assessed on a "per trip" basis.

Act 209 requires a minimum future planning horizon of five years. A 10-year planning horizon has been selected for the purpose of this analysis, and the future year 2035 will be considered the design year. However, this document is not a static, "one-time" effort, as the Act 209 legislation has provisions for periodic updates of the Roadway Sufficiency Analysis, Transportation Capital Improvement Plan, and Traffic Impact Fee Ordinance, as changes in the land use assumptions, transportation improvement needs, or funding conditions occur.

Land Use Assumptions

As required by Act 209, a *Land Use Assumptions Report* (dated April 2025) was prepared and completed by the New Garden Township TIFAC with the assistance of Bowman for the purposes of completing this *Roadway Sufficiency Analysis*. Subsequently, the Board of Supervisors adopted the *Land Use Assumptions Report*, as required by Act 209, on April 21, 2025. A copy of the *Land Use Assumptions Report* is provided in **Appendix B**.

The *Land Use Assumptions Report* identifies the potential anticipated ultimate development build-out within the designated Transportation Service Area, as well as the projected build-out on a development zone basis to the year 2035, and it provides figures illustrating the location of these zones. The *Land Use Assumptions Report* projections were used for projecting future development trip generation and for completing the traffic analysis contained in this study. The projected 2035 development, which is the basis of this analysis, is summarized below in **Table 1**.

Table 1. Land Use Assumptions Report 2035 Development Summary

Land Use Classification	10-Year Development Projection
Residential	442
Non-Residential	2,852,964 square feet

Existing Transportation Network

This *Existing Transportation Network* section includes designation of the roadways and intersections selected to be evaluated as part of this *Roadway Sufficiency Analysis*, as well as an inventory of physical and operational characteristics of the existing Township transportation system required for the completion of the *Roadway Sufficiency Analysis*. This section also delineates the Transportation Service Area required by the Act 209 legislation.

Roadway Characteristics

The New Garden Township roadway system, as illustrated in **Figure 1**, consists primarily of two-lane, undivided highways. Major regional access to the Township is provided via the Kennett Oxford Bypass (Route 1), providing access to the east and west, Gap Newport Pike (Route 41) providing movement towards the northwest and southeast, and Newark Road providing access towards the north and south. The roadway network shown in Figure 1 constitutes the transportation roadway network analyzed pursuant to Act 209. The operating characteristics of each major roadway are summarized in **Table 2**.

It is noted that for the purposes of this study, Baltimore Pike, Route 41, and the Kennett Oxford Bypass (U.S. Route 1) are considered to have an east-west orientation through the Township. Newark Road, Penn Green Road, and Limestone Road are considered to north-south routes.

Table 2. Existing Transportation Network Summary

Roadway (Jurisdiction)	Roadway Classification [1]	Posted Speed Limit (mph)
US Route 1 (S.R. 0001 – State)	Expressway	45 to 55 (unposted)
Newark Road (S.R. 3033, S.R. 3025, S.R. 3105 – State)	Major/Community Collector	25 to 40
Baltimore Pike / Cypress Street (S.R. 3046 – State)	Minor/Community Arterial	35 to 45
Penn Green Road (S.R. 3009 south of Route 41, Township north of Route 41)	Minor/Neighborhood Collector	35
Bancroft Road (Township)	Local Distributor	30
Chambers Road (Township)	Local Distributor	35
Scarlet Road (Township)	Local Distributor	25 to 35
Gap Newport Pike (S.R. 0041 – State)	Major/Regional Arterial	45
Hillendale Road (Township)	Minor/Neighborhood Collector	35
New Garden Road (Township)	Local Distributor/Local	35
Buck Toe Road (Township)	Local Distributor	35
Starr Road (Township)	Minor/Neighborhood Collector	35 to 40
Sunny Dell Road (S.R. 3024 – State)	Local Distributor	40
Sharp Road (Township)	Local Distributor	35
Sheehan Road (Township)	Local	30
Reynolds Road (Township)	Local Distributor	30
Limestone Road/Kaolin Road (S.R. 3013 – State)	Major/Regional Arterial	40 to 45
Southwood Road (Township)	Local Distributor	25 to 35

(1) The New Garden Township Comprehensive Plan.

Twenty-six study intersections have been selected by the Township to be evaluated and included in the *Roadway Sufficiency Analysis* and *Transportation Capital Improvements Plan*. These intersections are listed in **Table 3**.

Table 3. Study Intersections

Intersection Reference No.	Intersection	Current Traffic Control
1	US Route 1 Westbound Ramp (S.R. 8015) and Newark Road (S.R. 3033)	Stop Sign
2	US Route 1 Eastbound Ramp (S.R. 8015) and Newark Road (S.R. 3033)	Stop Sign
3	Baltimore Pike (S.R. 3046) and Penn Green Road	Stop Sign
4	Baltimore Pike (S.R. 3046) and Newark Road (S.R. 3033)	Signalized
5	Baltimore Pike (S.R. 3046) and Bancroft Road	Stop Sign
6	Baltimore Pike (S.R. 3046) and Chambers Road	Signalized
7	West Cypress Street (S.R. 3046) and Scarlet Road	Signalized
8	Baltimore Pike (S.R. 3046) and Scarlet Road	Signalized
9	Hillendale Road and Newark Road (S.R. 3033)	Stop Sign
10	New Garden Road/Buck Toe Road and Newark Road (S.R. 3033)	Stop Sign
11	Buck Toe Road and New Garden Road	Stop Sign
12	Gap Newport Pike (S.R. 0041) and Penn Green Road (S.R. 3009)	Signalized
13	Gap Newport Pike (S.R. 0041) and New Garden Road (West)	Stop Sign
14	Gap Newport Pike (S.R. 0041) and Newark Road (S.R. 3033)	Signalized
15	Gap Newport Pike (S.R. 0041) and New Garden Road (East)	Stop Sign
16	Gap Newport Pike (S.R. 0041) and Starr Road/Brittany Drive	Stop Sign
17	Gap Newport Pike (S.R. 0041) and Sunny Dell Road	Stop Sign
18	Gap Newport Pike (S.R. 0041) and Sharp Road	Stop Sign
19	Sheehan Road and Sharp Road	Stop Sign
20	Route 41 Eastbound Ramps (S.R. 8021) and Limestone Road (S.R. 3013)	Stop Sign
21	Route 41 Westbound Ramps (S.R. 8021) and Limestone Road (S.R. 3013)	Stop Sign
22	Kaolin Road/Ewart Road and Limestone Road (S.R. 3013)	Stop Sign
23	Starr Road and Penn Green Road (S.R. 3009)	Stop Sign
24	Starr Road and Newark Road (S.R. 3033)	Stop Sign
25	Kennett Middle School Driveway/Reynolds Road and Sunny Dell Road (S.R. 3024)	Stop Sign
26	Southwood Road and Limestone Road (S.R. 3013)	Signalized

Transportation Service Area

Act 209 requires the establishment of specific study boundaries, or Transportation Service Areas, for evaluation and application of transportation impact fees. By law, each transportation Service Area is required to be completely continuous and is limited to a maximum size of seven square miles. Moreover, Traffic Impact Fees for each Transportation Service Area are applicable only to development located within that respective service area, and therefore, development traffic from one service area is considered pass-through traffic within the other service area(s) if multiple Transportation Service Areas are adopted. Further explanation of pass-through and development traffic will be provided in subsequent sections.

Since New Garden Township is approximately 16 square miles in overall size, several areas of the Township were excluded from the Transportation Service Area encompassing the entire Township were established in accordance with the requirements of Act 209. Based on the Land Use Assumptions Report, Transportation Service Area is approximately 6.99 square miles in size, is generally along the Route 41, Newark Road, and Baltimore Pike corridors. A map of the Transportation Service Area is provided in **Figure 2**.

Existing Traffic Volumes

Traffic operating conditions are influenced by the relationships between traffic volumes and the capacity of the roadways and intersections. In order to evaluate existing traffic conditions, manual turning movement traffic counts were conducted at each of the 26 study intersections during the weekday morning peak period (7:00 AM to 9:00 AM) and afternoon peak period (4:00 PM to 6:00 PM) on typical weekdays in April 2024. These traffic counts were tabulated by fifteen-minute periods to establish the four highest consecutive 15-minute periods, which constitute the weekday afternoon peak hour.

Figure 3 illustrates the 2024 existing weekday morning and weekday afternoon peak hour traffic volumes at the study intersections. The actual traffic counts are provided in **Appendix C**.

Existing Transportation Conditions

The evaluation of the existing transportation network is based on the physical (i.e., traffic control, intersection geometry, lane usage, etc.) and operational (i.e., traffic volumes, signal timing/phasing) characteristics of the study intersections and roadways during the peak operational period. The TIFAC has selected the weekday afternoon peak hour as the basis of this *Roadway Sufficiency Analysis*.

Analysis Methodology

The weekday afternoon peak hour traffic volumes in Figure 3 were subject to detailed capacity/level-of-service analysis in accordance with the standard techniques contained in the ***Highway Capacity Manual***[(1)]. Level of service (LOS) is the criterion utilized to evaluate the study intersections in accordance with standard traffic engineering practice and the Act 209 legislation. A summary this methodology is provided in **Appendix D**.

Preferred Levels of Service

Consistent with the Act 209 legislation, the TIFAC has adopted preferred level-of-service criteria for the various intersections studied. The preferred level of service is considered the operational design standard by which each study intersection must operate under existing conditions, future pass-through conditions, and future development conditions in this *Roadway Sufficiency Analysis*. Any deficient operations that do not satisfy the preferred levels of service at the study intersections must be improved for each condition.

According to Act 209, for unsignalized intersections where the preferred level of service criterion is not satisfied, most often only signalization can mitigate the traffic deficiency; however, where traffic volumes do not meet traffic signal warrant criteria, as required by PennDOT, these intersections cannot be improved through signalization. Therefore, the required signalization improvement must be waived or deferred until traffic volumes warrant signalization. As shown in **Table 4**, the Transportation Advisory Committee has adopted specific preferred level-of-service criteria for the purposes of this *Roadway Sufficiency Analysis*.

Table 4 – Preferred Level-of-Service Criteria

Intersection/Roadway Type	Preferred Level of Service
Signalized	**LOS D** all movements
	LOS D overall
Unsignalized	**LOS D** movements

For signalized intersections, the preferred levels of service indicated above apply to individual movements, as well as overall intersection operations. Conversely, for unsignalized intersections, the preferred levels of service apply only to the critical turning or through movements.

(1) *Transportation Research Board, Special Report 209, Highway Capacity Manual, 6TH Edition published by the Transportation Research Board, Washington, DC, Updated 2016.*

The preferred level of service criteria may be waived at specific locations under certain circumstances according to the Municipalities Planning Code. These circumstances include unavailable right-of-way, physical or environmental constraints, topographic limitations, etc.

Existing Levels of Service

The year 2024 existing weekday afternoon peak hour traffic volumes presented in Figure 3 were subjected to the detailed capacity/level-of-service analysis methodology previously described. The results of the analysis are illustrated in **Figure 4**, and the detailed capacity/level-of-service analysis worksheets are contained in **Appendix E**.

As shown in Figure 4, of the 26 study intersections, 21 presently operate at acceptable levels of service with respect to the preferred levels of service during the weekday afternoon peak hour. The remaining five study intersections, which do not satisfy the preferred levels of service criteria, are unsignalized intersections with the exception of the signalized intersection of Baltimore Pike and Chambers Road. The intersection of Baltimore Pike and Chambers Road presently operates at acceptable overall LOS B, however the northbound approach presently operates at unacceptable LOS F.

The following unsignalized intersections operate at LOS F on at least one of the minor street movements:

- Gap Newport Pike (S.R. 0041) and New Garden Road (East)
- Gap Newport Pike (S.R. 0041) and Starr Road/Brittany Drive
- Gap Newport Pike (S.R. 0041) and Sunny Dell Road
- Gap Newport Pike (S.R. 0041) and Sharp Road

Existing Improvement Program

The improvements necessary to mitigate existing traffic deficiencies and satisfy the preferred level-of-service criteria are described in **Table 5**, and the geometric and traffic signal improvements are also illustrated in **Figure 5**. Improvements will be required at three study intersections in order to achieve the preferred level-of-service under present traffic conditions. It is noted that since the weekday afternoon peak hour traffic conditions will be the basis of the Transportation Impact Fee, the improvements will identified below are based on the weekday afternoon peak hour levels of service only, and the weekday morning peak hours levels of service are shown for informational purposes only.

Since improvements will be recommended for several unsignalized intersections, alternative types of improvements (i.e., signalization and roundabouts) were preliminarily evaluated/considered in accordance with PennDOT's Intersection Control Evaluation (ICE) guidelines. An initial planning level ICE screening for unsignalized intersections has been completed under existing, future pass-through, and future development conditions. The cumulative ICE evaluation summary is provided later in this report.

If a traffic signal is installed at the intersections of PA Route 41/New Garden Road (East) and PA Route 41/Starr Road/Brittany Drive, these currently unsignalized intersections will satisfy the preferred levels of service.

At the signalized intersection of Baltimore Pike/Chambers Road, traffic signal timing modifications are required to achieve the preferred levels of service.

At the unsignalized intersection of PA Route 41/Sharp Road, the existing traffic volumes fail to meet PennDOT's traffic volume warrants for installation of a traffic signal. As such, improvements at this intersection will deferred until traffic signal warrants are met.

Future Traffic Conditions

Act 209 requires a minimum five-year future time horizon for the development of the *Transportation Capital Improvements Plan* and *Transportation Impact Fee Ordinance*. A 10-year time frame was selected by the Transportation Advisory Committee for the New Garden Township Act 209 traffic analysis (2024 to 2035). The *Land Use Assumptions Report* projected the ultimate build-out potential of the Township, as well as the 2035 development projections for the Township as a whole.

Future Traffic Components

Total future traffic volume forecasts for 2035 include three components: existing traffic, pass-through traffic, and development traffic. The first component, **existing traffic** was described in the previous section. The second component of future traffic projections is **pass-through traffic**, which is subdivided into the following three elements:

- The first element reflects future increases in regional traffic, which is both generated and destined to locations external to the Transportation Service Area, but which pass through the service area along the study roadways. This first element of pass-through traffic includes traffic generated by specific known future developments located within the adjacent municipalities.
- The second element of future traffic includes future traffic generated from planned and approved developments located within New Garden Township which pass through the study area roadways.
- The third element of future traffic growth is estimated by applying a background traffic growth factor to the existing traffic volumes. The study uses a background traffic growth factor of 0.48 percent per year, which is slightly higher than the current background traffic growth factor of 0.44 percent per year based on information gathered by PennDOT's Bureau of Planning and Research for August 2024 to July 2025. Based on the combination of all three elements of future traffic noted above, the effective per year traffic growth rate on the various study area roadways ranges from 3.4 percent per year to 12.3 percent per year.

Development traffic that is generated by new development within the Transportation Service Area constitutes the third and final component of future 2035 traffic volumes, based upon the development projections contained in the *Land Use Assumptions Report*.

Trip Generation

Based upon the *Land Use Assumptions Report*, vehicular trip generation was estimated for the 2035 weekday afternoon peak hour utilizing the Institute of Transportation Engineers' publication, ***Trip Generation, 11^{h} Edition***. Additionally, several actively proposed developments were also specifically included in the future 2035 traffic projections to represent current development activity within the Township. The resulting 2035 weekday afternoon peak hour trip generation is summarized in **Table 6** for each service area, and more detailed information regarding the peak hour trip generation of each of the projected developments is provided in **Appendix F**.

Table 6 – Development Conditions Vehicular Trip Generation

Service Area	Total Trip Generation
TSA	3,394 trips

Trip Distribution

Vehicular traffic volumes generated by new development over the next ten years were generally distributed to the area roadway network based on existing travel patterns, as well as the location of specific future development parcels with respect to the roadway network and other major traffic generators and destinations.

2035 Future Pass-Through Traffic

An annual traffic growth rate of 2.05 percent per year was applied to the existing weekday afternoon peak hour traffic volumes to reflect regional traffic growth, which is consistent with the traffic growth rate recommended by PennDOT's Bureau of Planning and Research for similar roadways in Chester County.

In addition, traffic associated with 11 developments located within the surrounding municipalities was distributed through the Township roadway network. These 11 developments, as summarized in **Table 7,** represent the known proposed developments identified by staff of the surrounding municipalities, and were determined to have an influence on the study roadways and intersections.

Table 7 – Proposed Development in Surrounding Municipalities

Municipality	Development	Size
Kennett Township	Kennett Gateway	24 apartments, 53 townhomes, and 14,000 square feet of retail space
	Smith Property	72 single-family homes
East Marlborough Township	802-804 & 805 E. Baltimore Pike	A 5,440 square-foot convenience market, a 2,332 square-foot restaurant, and a 25,500 square-foot medical office building
	532 Walnut Road	33 townhomes
New Garden Township	Stonebridge at Logwood	51 single-family homes
	Copperleaf Ridge	98 townhomes
	New Garden Elementary School	105,240 square-foot elementary school
	Church Street Mews	9 townhomes
	New Garden Center Popeye's	A 2,402 square-foot fast food restaurant
	160 Starr Road	A 15,615 square-foot agricultural building
	163 Sheehan Road	43 townhomes

The 2035 future pass-through weekday morning and weekday afternoon peak hour traffic volumes are illustrated in **Figure 6**. The detailed trip generation for the developments assumed in the 2035 future pass-through conditions have been included in **Appendix G.**

2035 Future Development Traffic

As previously explained, the traffic generated by new development located within the Transportation Service Area constitutes the third and final component of future 2035 traffic. The 2035 future development weekday morning and weekday afternoon peak hour traffic volumes were determined based on assignment of development traffic within the Transportation Service Area and added to 2035 future pass-through traffic volumes. The 2035 future development traffic volumes are illustrated in **Figure 7**.

Programmed Improvements

PennDOT has several active improvement programs planned at the study area intersections, as follows. It is anticipated that these projects will be completed by 2035:

- **Kennett Oxford Bypass Interchange with Newark Road –** PennDOT plans to install a single lane roundabout at both the Northbound and Southbound off ramp intersections with Newark Road.

- **Baltimore Pike and Newark Road –** PennDOT plans to improve this intersection by realigning the north leg of the intersection to better align with the southern leg of the intersection. In addition, it is proposed to widen eastbound Baltimore Pike for a separate left-turn lane, and westbound Baltimore Pike for separate left- and right-turn lanes. It is also planned to widen northbound Newark Road for a separate left-turn lane and southbound Newark Road for a separate left- and right-turn lane.

2035 Future Pass-Through Traffic Levels of Service

The future 2035 pass-through traffic volumes illustrated in Figure 6 were subject to the previously described capacity/level-of-service analysis procedures to determine 2035 pass-through levels of service, and the detailed analyses are provided in **Appendix H**. As required by Act 209, the future conditions analysis was completed for future 2035 pass-through traffic volumes for each study intersection, assuming implementation of the improvements included in the Existing Capital Improvement Program, in order to determine the incremental traffic impacts and required for mitigation of future pass-through traffic.

Figure 8 summarize the results of the 2035 future pass-through traffic capacity/level-of-service analyses for the study intersections, with completion of the previously described programmed and required improvements. Traffic operating conditions at the following study intersections will not satisfy the preferred level of service criteria under 2035 future pass-through conditions.

- Baltimore Pike and Bancroft Road
- PA Route 41 and Sunny Dell Road
- PA Route 41 and Sharp Road

2035 Future Pass-Through Improvement Program

The additional improvements required to accommodate pass-through traffic, beyond those improvements necessary to accommodate existing traffic at the preferred levels of service are illustrated in **Figure 9.** Also, these specific improvements required by future pass-through traffic to achieve the preferred level of service criteria are summarized in more detail in **Table 8** for each study intersection. Improvements will be required at two study intersections in order to achieve the preferred level-of-service under future pass-through traffic conditions. It is noted that although the intersection of PA Route 41 and Sharp Road does not meet the preferred level-of-service criteria, PennDOT's traffic signal warrant criteria are also not met, and therefore improvements at this intersection are deferred.

In order to achieve the preferred level-of-service criteria at the Baltimore Pike/Bancroft Road intersection, it is recommended to install a traffic signal, which is warranted based on PennDOT criteria.

At the PA Route 41/Sunny Dell Road intersection it is necessary to install a traffic signal and widen westbound PA Route 41 to provide a separate left-turn lane.

In addition, it is noted that the programmed improvement noted above at the Newark Road intersections with the U.S. Route 1 Northbound Ramps, the U.S. Route 1 Southbound Ramps, and Baltimore Pike will allow each of these intersections to achieve the preferred level-of-service criteria.

2035 Future Development Traffic Levels of Service

The future development traffic volumes presented in Figure 7 were subject to the previously described capacity/level-of-service analysis procedures to determine future 2035 development levels of service, and the detailed analyses are provided in **Appendix I**. The 2035 future development conditions are illustrated in **Figure 10**, and indicate that the following 12 study intersections will not satisfy the preferred levels of service criteria, and will require further improvements beyond the previously identified existing improvements, programmed/committed improvements, and future pass-through improvements:

- Baltimore Pike and Penn Green Road
- Baltimore Pike and Newark Road
- Baltimore Pike and Chambers Road
- Newark Road and Hillendale Road
- Newark Road and New Garden Road
- PA Route 41 and Newark Road
- PA Route 41 and Starr Road
- PA Route 41 and Sunny Dell Road
- PA Route 41 and Sharp Road
- Limestone Road and PA Route 41 Eastbound Ramps
- Limestone Road and Ewart Road/Kaolin Road
- Newark Road and Starr Road

2035 Future Development Improvement Program

The improvements necessary to achieve the preferred level of service criteria under 2035 development traffic conditions at the study intersections are summarized in **Table 9** and are also illustrated in **Figure 11**. In summary, improvements will be required

at 12 study intersections to accommodate development-generated traffic within the respective transportation service area to satisfy the preferred levels-of-service.

In order to achieve the preferred level-of-service criteria at the Baltimore Pike/Penn Green Road, Newark Road/Hillendale Road, Limestone Road/PA Route 41 Eastbound Ramps, and Newark Road/Starr Road intersections, it is necessary to install a traffic signal at each intersection, which are warranted based on PennDOT criteria.

At the intersections of Newark Road/New Garden Road/Bucktoe Road and Limestone Road/Kaolin Road/Ewart Road, a traffic signal would achieve preferred levels of service at both intersections, along with realignment of Bucktoe Road to intersect New Garden Road south of the existing intersection.

At the Baltimore Pike/Newark Road intersection, it is necessary to widen eastbound Baltimore Pike for a second through lane and southbound Newark Road for a separate right-turn lane; however, even these improvements fail to achieve the preferred level-of-service at this intersection. Furthermore, due to the close spacing of roadside development within the Village of Toughkenamon, it is not feasible to provide a second eastbound Baltimore Pike through lane. As such, it is recommended to widen eastbound Baltimore Pike for a separate right-turn lane instead of providing a second through lane, and the additional improvements necessary to achieve the preferred level-of-service are deferred.

At the Baltimore Pike/Bancroft Road intersection, it is necessary to widen eastbound Baltimore Pike for a separate left-turn lane.

At the Baltimore Pike/Chambers Road intersection, it is necessary to widen eastbound Baltimore Pike and northbound Chambers Road for a separate right-turn lane.

At the intersection of PA Route 41 and Newark Road, it is necessary to widen PA Route 41 to provide a second through lane in each direction, as well as a westbound separate left-turn lane. In addition, it is necessary to widen southbound Newark Road for a second left-turn lane. With these improvements, this intersection will satisfy the preferred level-of-service criteria.

In order to achieve the preferred level-of-service at the PA Route 41/Starr Road intersection, it is necessary to widen eastbound PA Route 41 for a second through lane.

At the PA Route 41/Sunny Dell Road intersection, it is necessary to widen eastbound PA Route 41 for a second through lane and a separate right-turn lane. In addition, it is necessary to widen northbound Sunny Dell Road for a separate right-turn lane. These improvements will allow the intersection to achieve the preferred level of service.

At the PA Route 41/Sharp Road intersection, it is necessary to realign Sharp Road and Sheen Road such that they no longer intersect PA Route 41. In addition, the new access point for Sharp Road and Sheehan Road along PA Route 41 will be opposite a new signalized access point for the property on the south side of PA Route 41 which is assumed to be developed within the next 10 years. This new intersection will require two through lanes in each direction along PA Route 41, as well as eastbound and westbound PA Route 41 left-turn lanes. With these improvements, the new intersection will achieve the preferred level-of-service criteria.

At the PA Route 41/New Garden Road (East) intersection, additional improvements are not required to achieve the preferred levels of service. However, due to the improvements necessary at the closely spaced PA Route 41 intersections with Newark Road and Starr Road, it is desirable to extend the improvements through the PA Route 41/New Garden Road (East)

intersection. Furthermore, the Route 41 Planning Study, prepared by Bowman, dated October 2024 recommends provision of a continuous center left-turn lane within New Garden Township, and this improvement is provided to be consistent with this recommendation.

At the PA Route 41/New Garden Road (West) intersection, additional improvements are not required to achieve the preferred levels of service. However, the Route 41 Planning Study, prepared by Bowman, dated October 2024 recommends provision of a continuous center left-turn lane within New Garden Township, and this improvement is provided to be consistent with this recommendation.

Preliminary PennDOT Intersection Control Evaluation (ICE)

Table 10 summarizes the initial evaluation of the alternative roundabout intersection improvements at currently unsignalized study intersections, where signalization may have traditionally been recommended in the past. This evaluation is based on a planning-level Level 1 Screening per PennDOT guidelines. As engineering for the recommended improvements advances in the future, a more detailed ICE evaluation will be required.

Table 10. Preliminary ICE Evaluation Study Intersections

Existing Conditions

Int No.	Intersection	Requires Improvements	Traffic Signal Warranted	Roundabout	Limitations	Recommended Improvement
15	Route 41 and New Garden Road (East)	Yes	Yes	Multi-Lane	Right-of-Way Grading Impacts	Traffic Signal
16	Route 41 and Starr Road/Brittany Drive	Yes	Yes	Multi-Lane	Right-of-Way Adjacent Structures	Traffic Signal

Future Pass-Through Conditions

Int No.	Intersection	Requires Improvements	Traffic Signal Warranted	Roundabout	Limitations	Recommended Improvement
1	Newark Road and U.S. Route 1 WB Ramps	Yes	Yes	Single-Lane	Right-of-way Grading Impacts	Roundabout (proposed by PennDOT)
2	Newark Road and U.S. Route 1 EB Ramps	Yes	Yes	Single-Lane	Right-of-way	Roundabout (proposed by PennDOT)
5	Baltimore Pike and Bancroft Road	Yes	Yes	Single-Lane	Right-of-Way Environmental Adjacent Structures	Traffic Signal
17	Route 41 and Sunny Dell Road	Yes	Yes	Multi-Lane	Right-of-Way	Traffic Signal

Future Development Conditions

Int No.	Intersection	Requires Improvements	Traffic Signal Warranted	Roundabout	Limitations	Recommended Improvement
9	Newark Road and Hillendale Road	Yes	Yes	Multi-Lane	Right-of-Way Grading Impacts Adjacent Structures	Traffic Signal
10	Newark Road/New Garden Road/Bucktoe Road	Yes	Yes	Single-Lane	Right-of-Way Adjacent Structures	Traffic Signal
18 & 19	Route 41 and Sharp Road/Sheehan Road	Yes	Yes	Multi-Lane	Right-of-Way Grading Impacts	Traffic Signal
20	Limestone Road and Route 41 EB Ramps	Yes	Yes	Multi-Lane	Right-of-Way Topography	Traffic Signal
22	Limestone Road and Ewart Road/Kaolin Road	Yes	No	Single-Lane	Right-of-Way Adjacent Structures	Roundabout
24	Newark Road and Starr Road	Yes	Yes	Single-Lane	Right-of-Way Grading Impacts	Traffic Signal

Table 5. Existing Improvement Program

Int No.	Intersection	Traffic Control	Recommended Capacity Improvements[1]
1	Newark Road and US Route 1 Westbound Ramp	Stop Sign	No improvements recommended or required.
2	Newark Road and US Route 1 Eastbound Ramp	Stop Sign	No improvements recommended or required.
3	Baltimore Pike and Penn Green Road	Stop Sign	No improvements recommended or required.
4	Baltimore Pike and Newark Road	Traffic Signal	No improvements recommended or required.
5	Baltimore Pike and Bancroft Road	Stop Sign	No improvements recommended or required.
6	Baltimore Pike and Chambers Road	Traffic Signal	Modify existing signal timings.
7	West Cypress Street and Scarlet Road	Traffic Signal	No improvements recommended or required.
8	Balimore Pike and Scarlet Road	Traffic Signal	No improvements recommended or required.
9	Newark Road and Hillendale Road	Stop Sign	No improvements recommended or required.
10	Newark Road and New Garden Road/Buck Toe Road	Stop Sign	No improvements recommended or required.
11	Buck Toe Road and New Garden Road	Stop Sign	No improvements recommended or required.
12	Route 41 and Penn Green Road	Traffic Signal	No improvements recommended or required.
13	Route 41 and New Garden Road (West)	Stop Sign	No improvements recommended or required.
14	Route 41 and Newark Road	Traffic Signal	No improvements recommended or required.
15	Route 41 and New Garden Road (East)	Stop Sign	Install a traffic signal.
16	Route 41 and Starr Road/Brittany Drive	Stop Sign	Install a traffic signal.
17	Route 41 and Sunny Dell Road/Driveway	Stop Sign	No improvements recommended or required.
18	Route 41 and Sharp Road	Stop Sign	No improvements recommended or required.
19	Sharp Road and Sheehan Road	Stop Sign	No improvements recommended or required.
20	Limestone Road and Route 41 Eastbound Ramps	Stop Sign	No improvements recommended or required.
21	Limestone Road and Route 41 Westbound Ramps	Stop Sign	No improvements recommended or required.
22	Limestone Road/Kaolin Road/Ewart Road	Stop Sign	No improvements recommended or required.
23	Starr Road and Penn Green Road	Stop Sign	No improvements recommended or required.
24	Newark Road and Starr Road	Stop Sign	No improvements recommended or required.
25	Sunny Dell Road and Reynolds Road/Kennett Middle School Driveway	Stop Sign	No improvements recommended or required.
26	Limestone Road and Southwood Road	Traffic Signal	No improvements recommended or required.

1 - Recommended improvements to achieve the preferred level-of-service requirements during the weekday afternoon peak hour.

Table 8. Pass-Through Improvement Program

Int No.	Intersection	Traffic Control	Recommended Capacity Improvements[1]
1	Newark Road and US Route 1 Westbound Ramp	Stop Sign	Install a single lane roundabout. This improvement is proposed by PennDOT
2	Newark Road and US Route 1 Eastbound Ramp	Stop Sign	Install a single lane roundabout. This improvement is proposed by PennDOT
3	Baltimore Pike and Penn Green Road	Stop Sign	No improvements recommended or required.
4	Baltimore Pike and Newark Road	Traffic Signal	Modify traffic signal timings and install an eastbound Baltimore Pike left turn lane, westbound Baltimore Pike left and right turn lanes, northbound Newark Road left and right turn lanes, and a southbound Newark Road left turn lane. This improvement is proposed by PennDOT
5	Baltimore Pike and Bancroft Road	Stop Sign	Install a traffic signal.
6	Baltimore Pike and Chambers Road	Traffic Signal	No improvements recommended or required.
7	West Cypress Street and Scarlet Road	Traffic Signal	No improvements recommended or required.
8	Balimore Pike and Scarlet Road	Traffic Signal	No improvements recommended or required.
9	Newark Road and Hillendale Road	Stop Sign	No improvements recommended or required.
10	Newark Road and New Garden Road/Buck Toe Road	Stop Sign	No improvements recommended or required.
11	Buck Toe Road and New Garden Road	Stop Sign	No improvements recommended or required.
12	Route 41 and Penn Green Road	Traffic Signal	No improvements recommended or required.
13	Route 41 and New Garden Road (West)	Stop Sign	No improvements recommended or required.
14	Route 41 and Newark Road	Traffic Signal	No improvements recommended or required.
15	Route 41 and New Garden Road (East)	Traffic Signal	No improvements recommended or required.
16	Route 41 and Starr Road/Brittany Drive	Traffic Signal	No improvements recommended or required.
17	Route 41 and Sunny Dell Road/Driveway	Stop Sign	Install a traffic signal and provide PA Route 41 westbound left turn lane.
18	Route 41 and Sharp Road	Stop Sign	No improvements recommended or required.
19	Sharp Road and Sheehan Road	Stop Sign	No improvements recommended or required.
20	Limestone Road and Route 41 Eastbound Ramps	Stop Sign	No improvements recommended or required.
21	Limestone Road and Route 41 Westbound Ramps	Stop Sign	No improvements recommended or required.
22	Limestone Road/Kaolin Road/Ewart Road	Stop Sign	No improvements recommended or required.
23	Starr Road and Penn Green Road	Stop Sign	No improvements recommended or required.
24	Newark Road and Starr Road	Stop Sign	No improvements recommended or required.
25	Sunny Dell Road and Reynolds Road/Kennett Middle School Driveway	Stop Sign	No improvements recommended or required.
26	Limestone Road and Southwood Road	Traffic Signal	No improvements recommended or required.

1 - Recommended improvements to achieve the preferred level-of-service requirements during the weekday afternoon peak hour.

Table 9. Development Improvement Program

Int No.	Intersection	Traffic Control	Recommended Capacity Improvements[1]
1	Newark Road and US Route 1 Westbound Ramp	Roundabout	No improvements recommended or required.
2	Newark Road and US Route 1 Eastbound Ramp	Roundabout	No improvements recommended or required.
3	Baltimore Pike and Penn Green Road	Stop Sign	Install a traffic signal.
4	Baltimore Pike and Newark Road	Traffic Signal	Provide a dedicated eastbound Baltimore Pike right turn lane.
5	Baltimore Pike and Bancroft Road	Traffic Signal	Provide an eastbound Baltimore Pike left turn lane.
6	Baltimore Pike and Chambers Road	Traffic Signal	Provide an eastbound Baltimore Pike right turn lane and northbound Chambers Road right turn lane.
7	West Cypress Street and Scarlet Road	Traffic Signal	No improvements recommended or required.
8	Balimore Pike and Scarlet Road	Traffic Signal	No improvements recommended or required.
9	Newark Road and Hillendale Road	Stop Sign	Install a traffic signal.
10	Newark Road and New Garden Road/Buck Toe Road	Stop Sign	Realign Buck Toe Road and install a traffic signal for the 4-leg intersection.
11	Buck Toe Road and New Garden Road	Stop Sign	Realign into New Garden Road as a unsignalized intersection.
12	Route 41 and Penn Green Road	Traffic Signal	No improvements recommended or required.
13	Route 41 and New Garden Road (West)	Stop Sign	Provide an eastbound PA Route 41 left turn lane.[2]
14	Route 41 and Newark Road	Traffic Signal	Provide a second eastbound PA Route 41 through lane, a westbound PA Route 41 right-turn lane and a second through lane lane, and a second southbound Newark Road left turn lane.
15	Route 41 and New Garden Road (East)	Traffic Signal	Provide an eastbound PA Route 41 left turn lane and a second through lane, and a westbound PA Route 41 left turn lane.[2]
16	Route 41 and Starr Road/Brittany Drive	Traffic Signal	Provide a second eastbound PA Route 41 through lane.
17	Route 41 and Sunny Dell Road/Driveway	Traffic Signal	Provide an eastbound PA Route 41 left turn lane, right turn lane, and second through lane, and northbound Sunny Dell Road right turn lane.
18	Route 41 and Sharp Road	Stop Sign	Realign Sharp Road to connect to Sheehan Road to create a continuous roadway, and remove its interseciton with PA Route 41.
19	Sharp Road and Sheehan Road	Stop Sign	Install a new signalized intersection opposite of the proposed White Clay Point Access with a left turn lane, a second through lane, and shared thru/right lane in both the eastbound and westbound directions along PA Route 41.
20	Limestone Road and Route 41 Eastbound Ramps	Stop Sign	Install a traffic signal.
21	Limestone Road and Route 41 Westbound Ramps	Stop Sign	No improvements recommended or required.
22	Limestone Road/Kaolin Road/Ewart Road	Stop Sign	Install a single lane roundabout.
23	Starr Road and Penn Green Road	Stop Sign	No improvements recommended or required.
24	Newark Road and Starr Road	Stop Sign	Install a traffic signal.
25	Sunny Dell Road and Reynolds Road/Kennett Middle School Driveway	Stop Sign	No improvements recommended or required.
26	Limestone Road and Southwood Road	Traffic Signal	No improvements recommended or required.

1 - Recommended improvements to achieve the preferred level-of-service requirements during the weekday afternoon peak hour.

2 - These improvements are provided for corridor consistency and will not be included as a developer responsibility in the Ttransportation Capital Improvements Plan and Transortation Impact Fee.

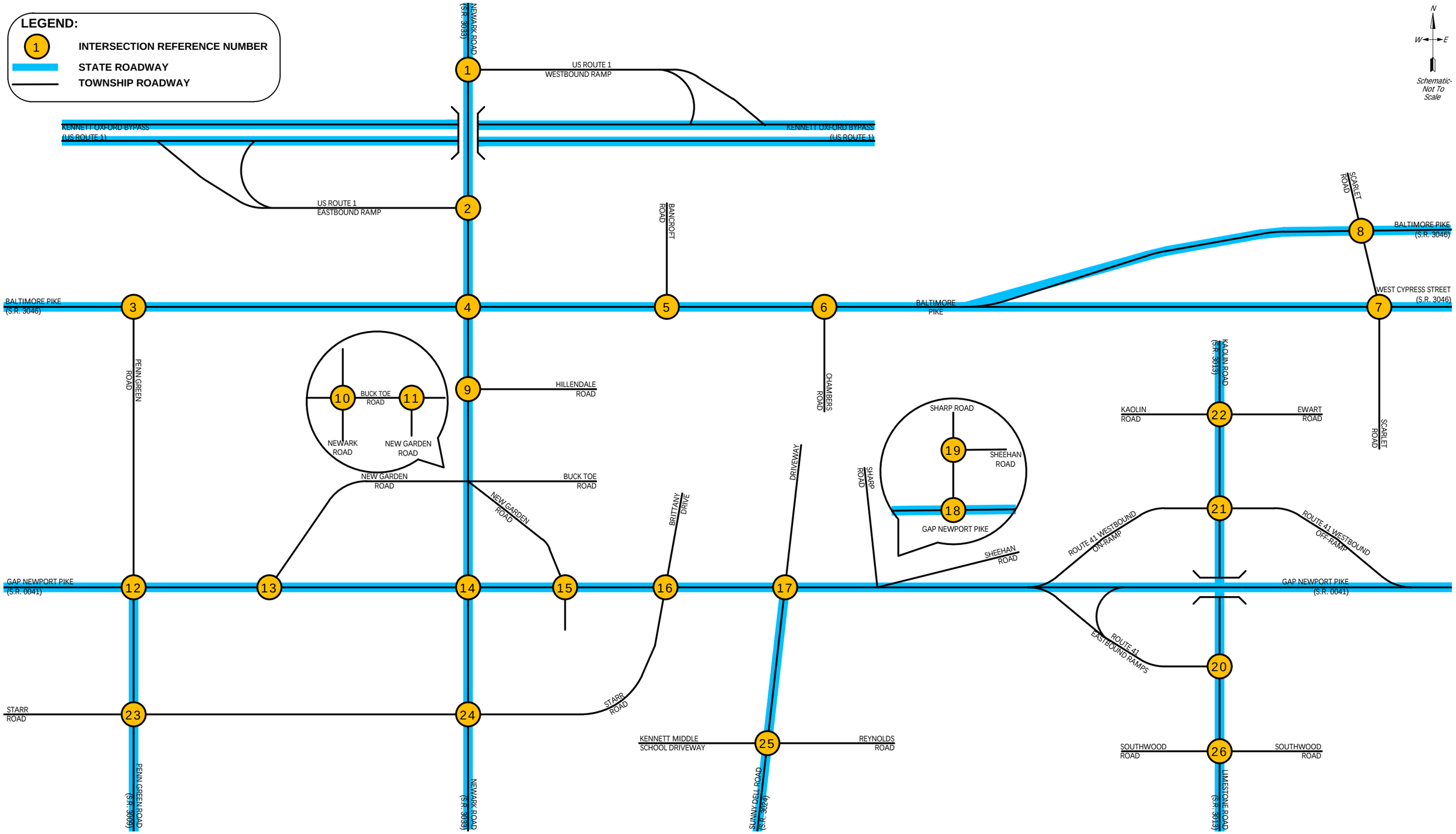

FIGURE 1
Study Area Map

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\1313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 1.dwg

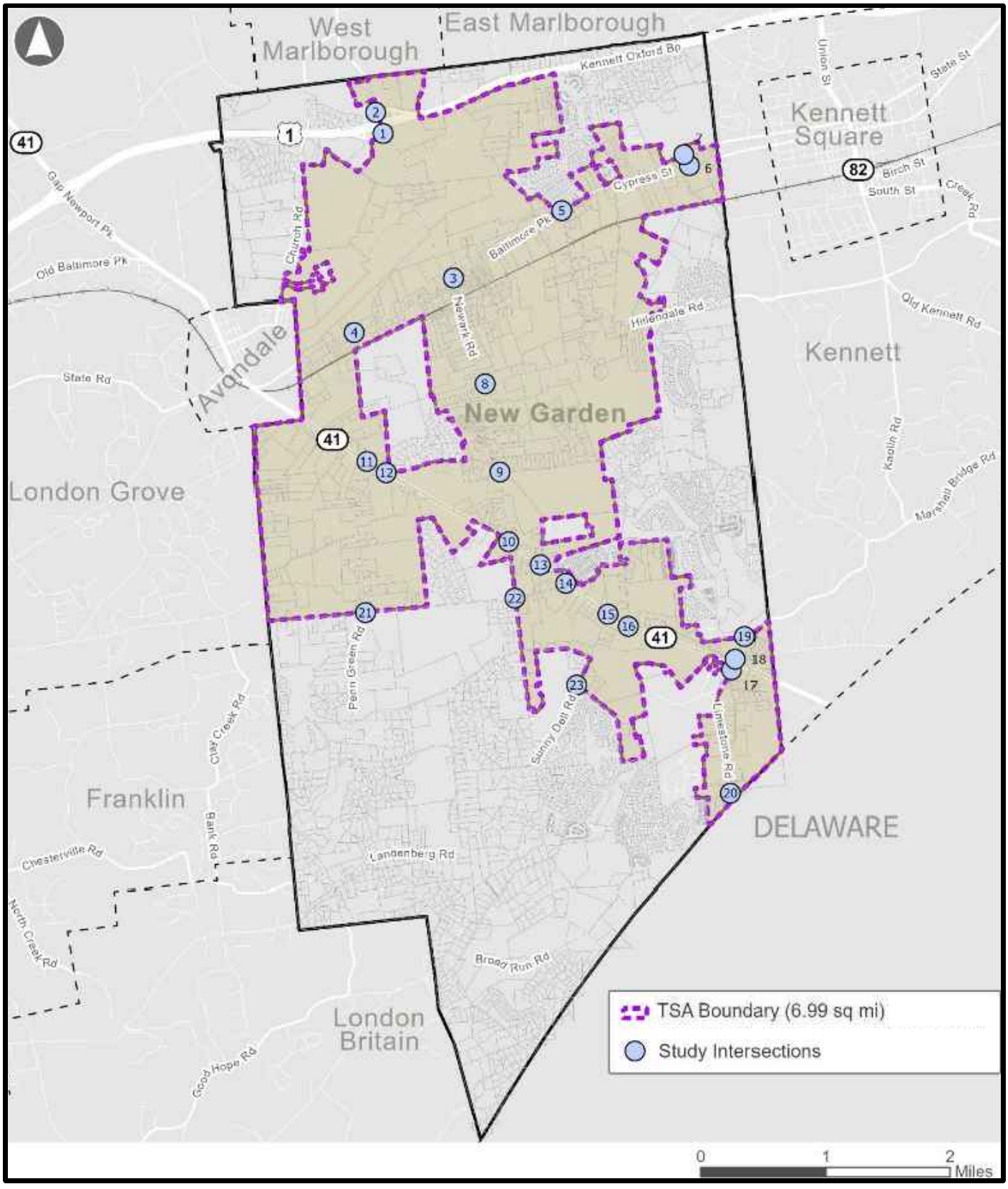

FIGURE 2
LUAR Map

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 2.dwg

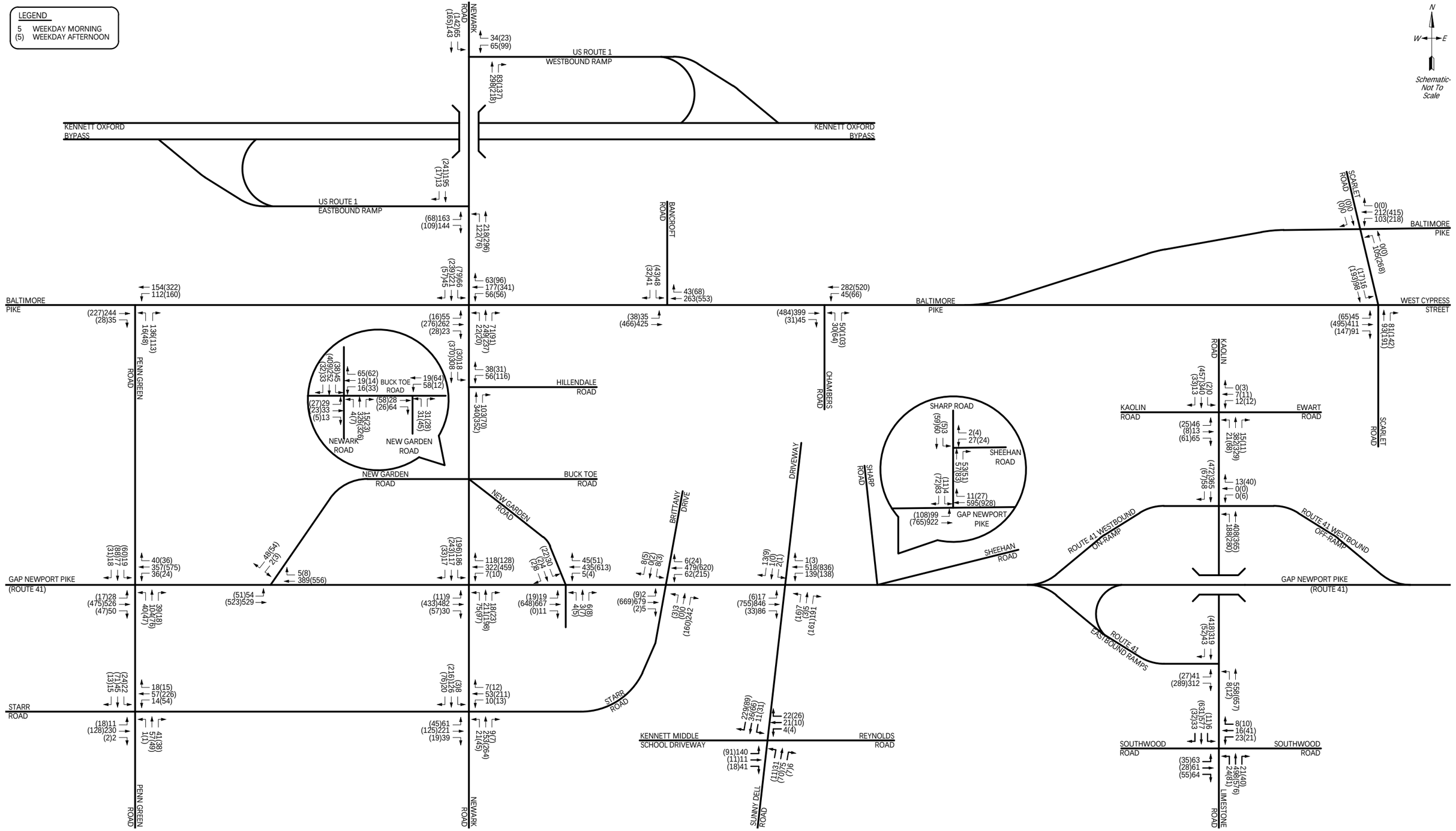

FIGURE 3

2024 Existing Peak Hour Traffic Volumes

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 3.dwg

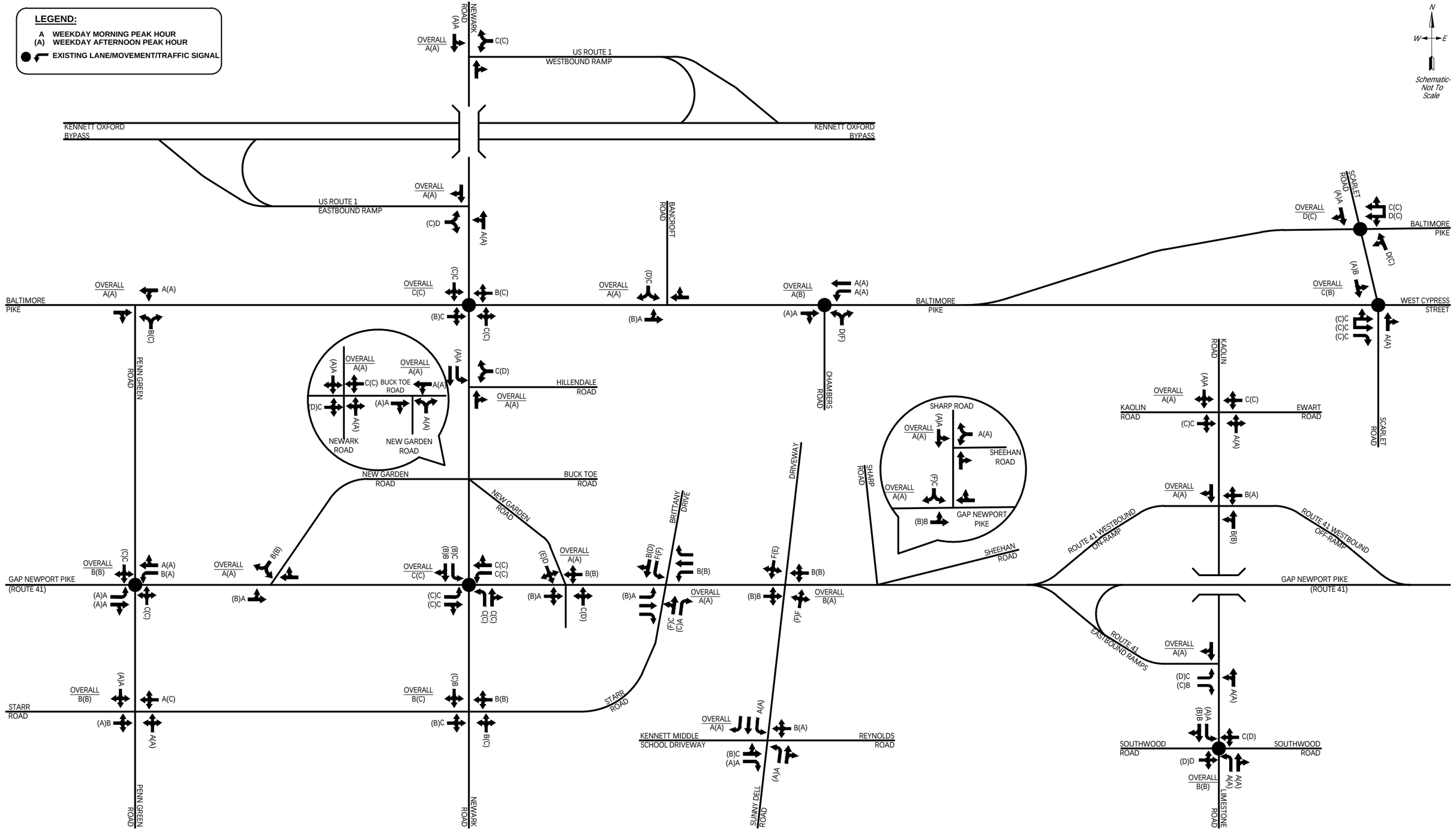

FIGURE 4
2024 Existing Peak Hour Levels of Service

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD\1313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 4.dwg

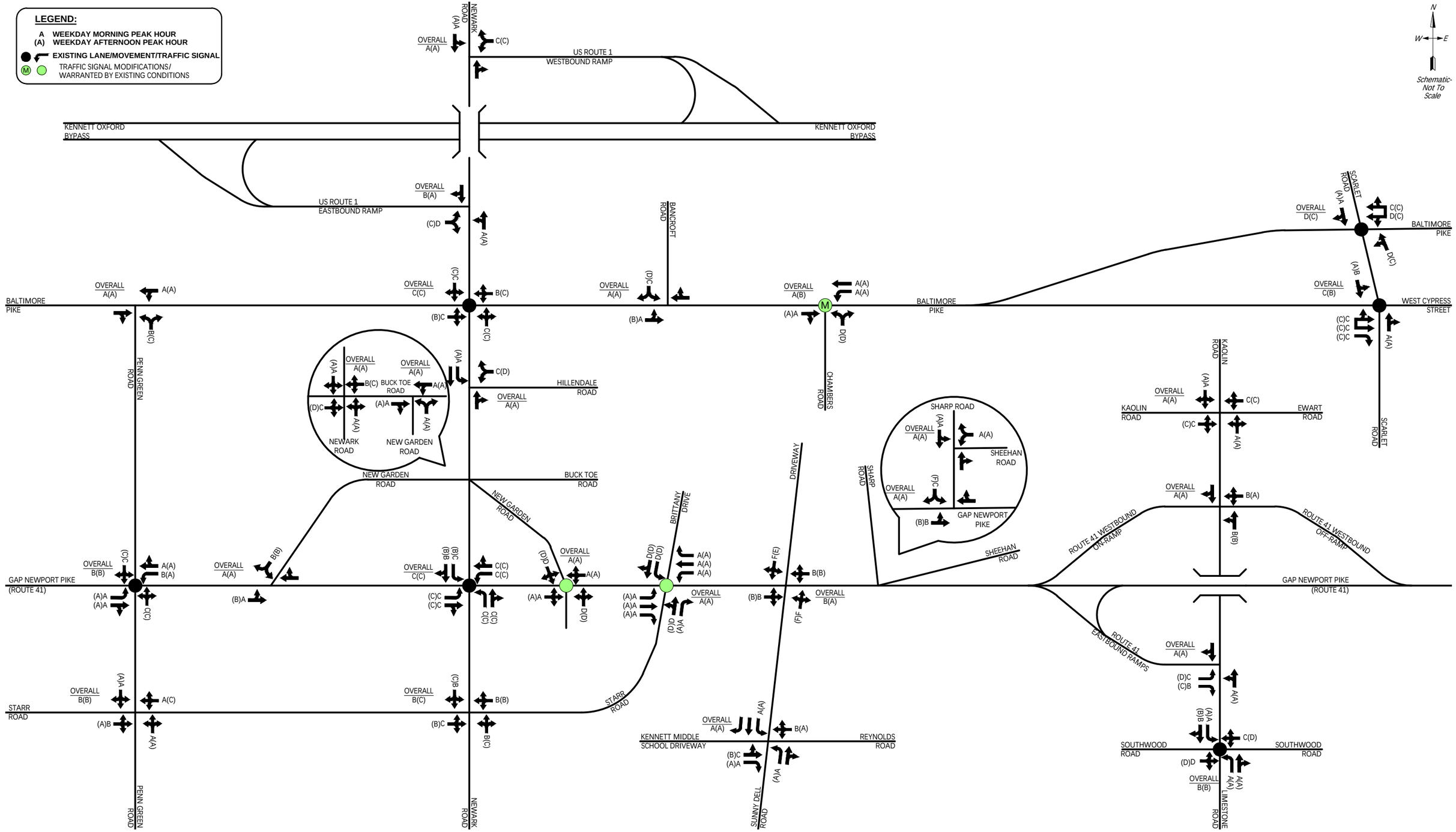

FIGURE 5
2024 Existing Peak Hour Levels of Service - with Improvements

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD\1313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 5.dwg

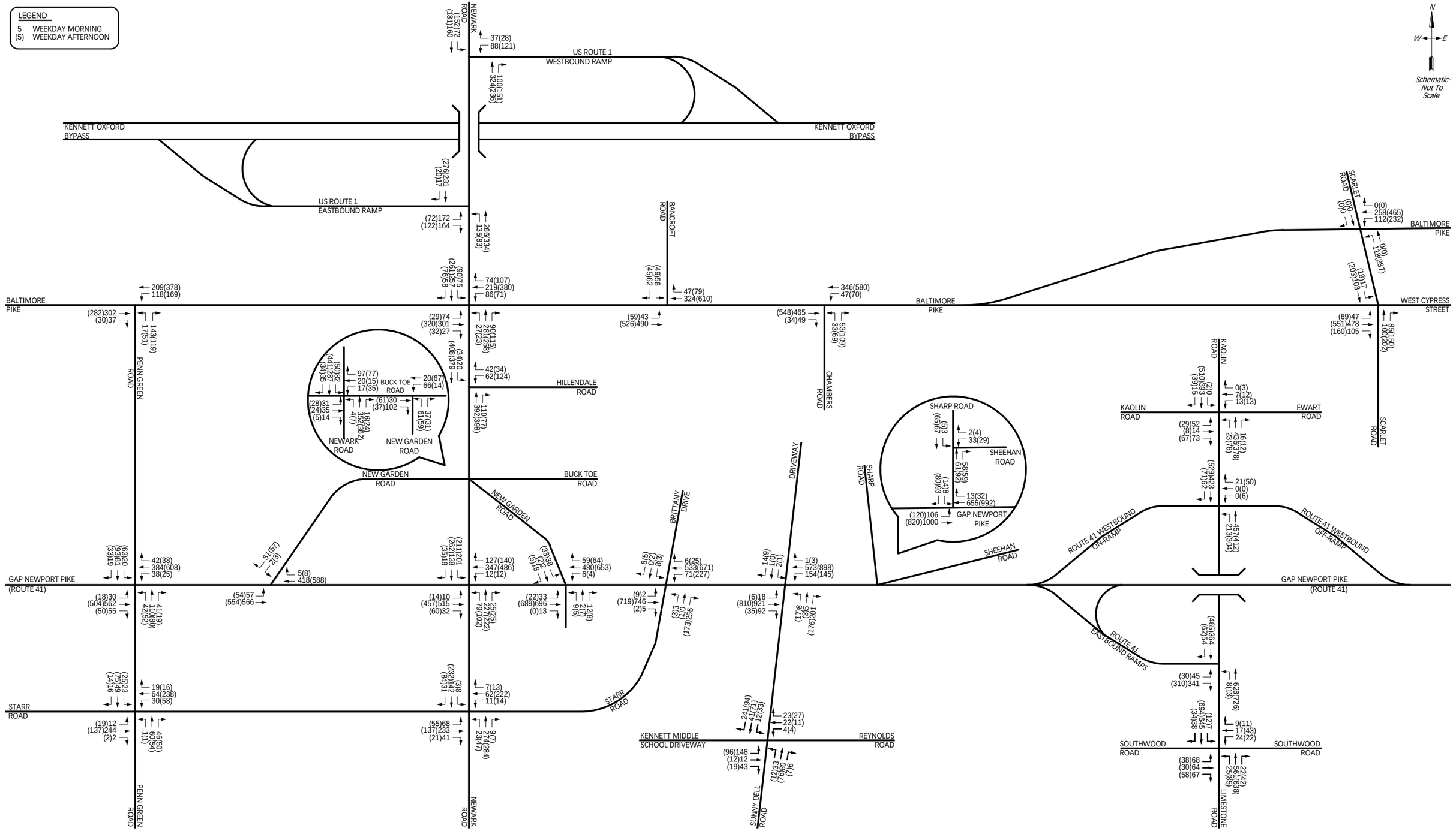

FIGURE 6

2035 Future Pass-Through Peak Hour Traffic Volumes

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 6.dwg

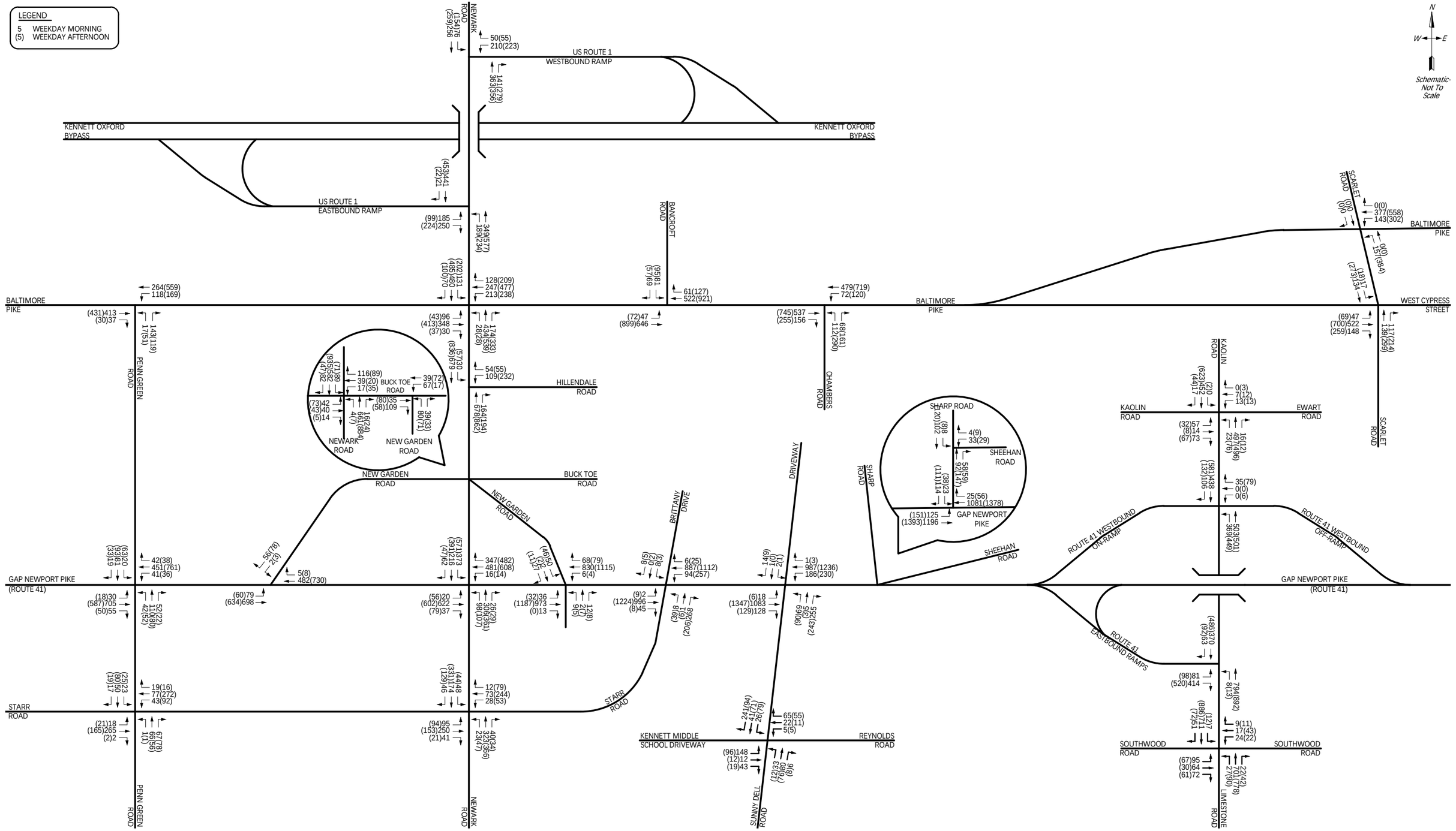

FIGURE 7

2035 Future Development Peak Hour Traffic Volumes

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 7.dwg

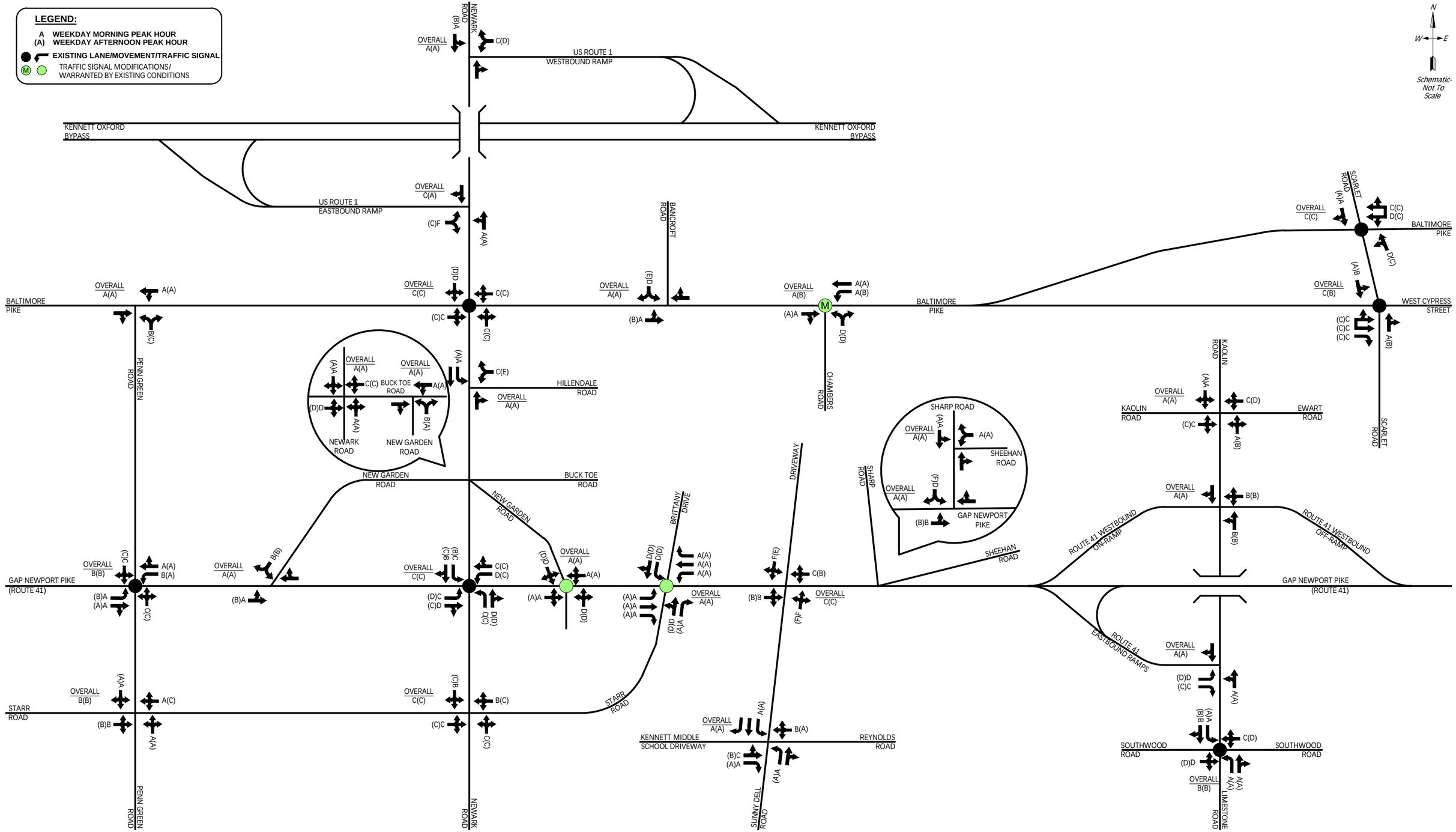

FIGURE 8

2035 Future Pass-Through Peak Hour Levels of Service

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 8.dwg

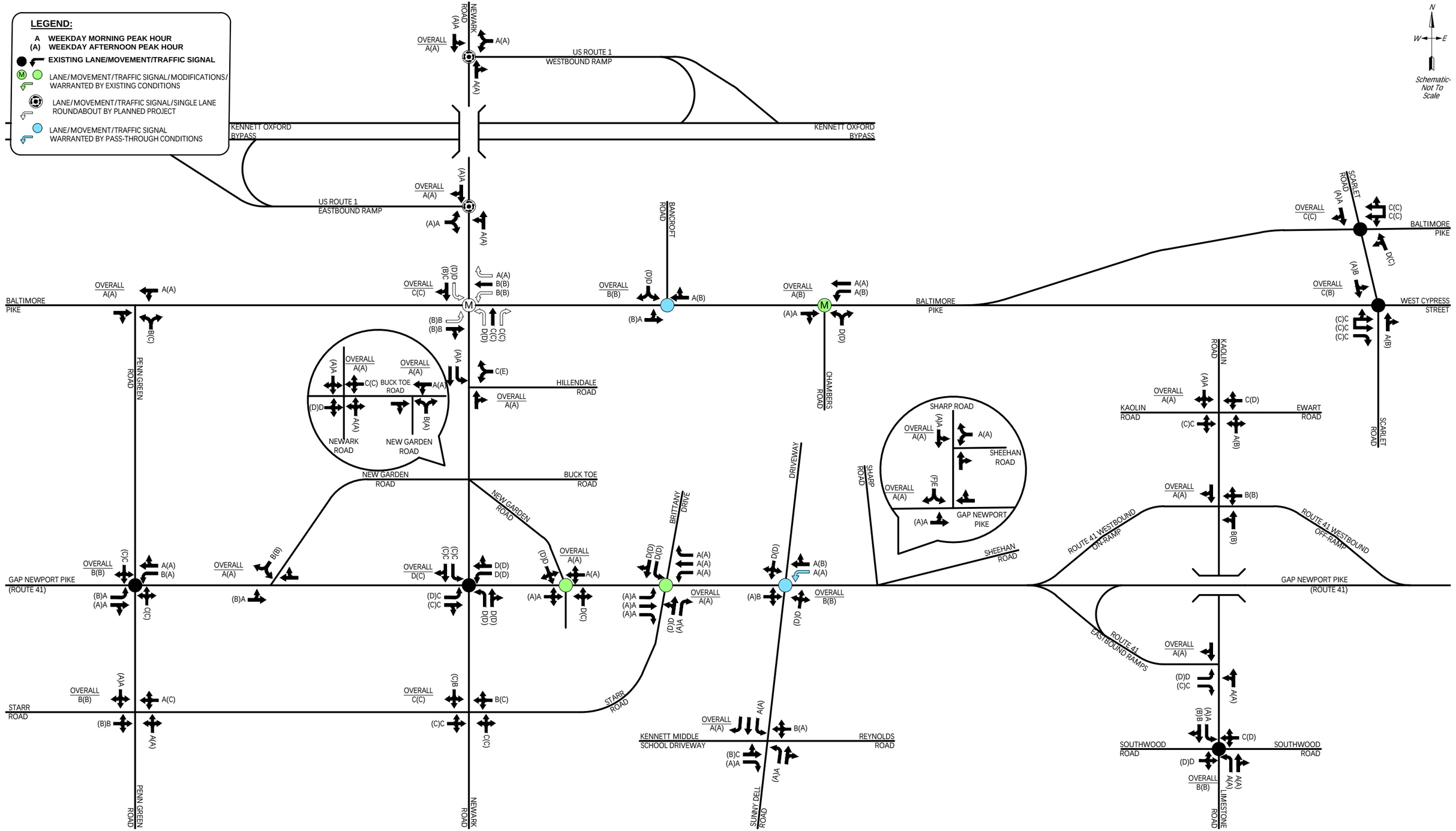

FIGURE 9

2035 Future Pass-Through Peak Hour Levels of Service - with Improvements

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 9.dwg

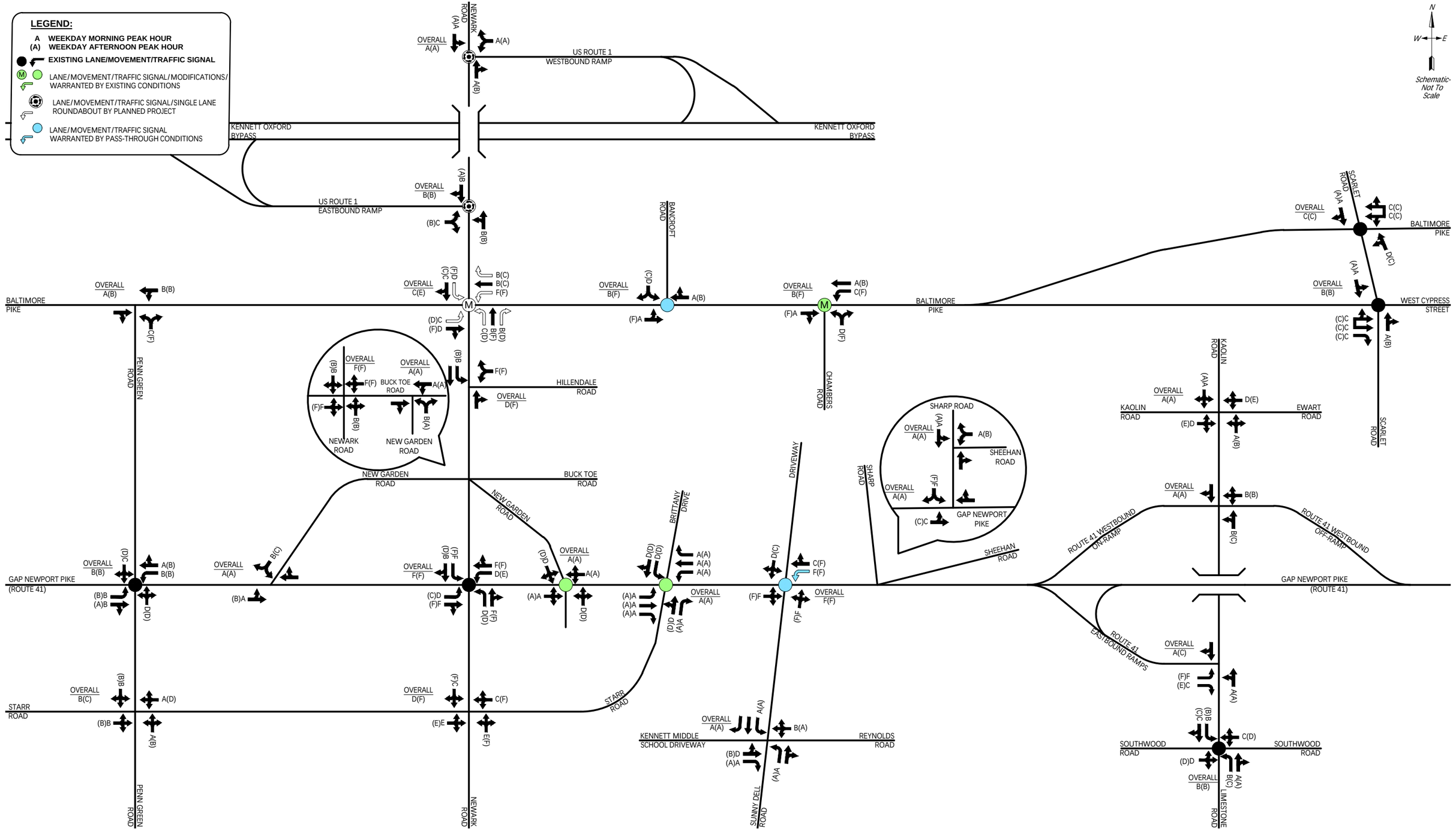

FIGURE 10

2035 Future Development Peak Hour Levels of Service

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\engl\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 10.dwg

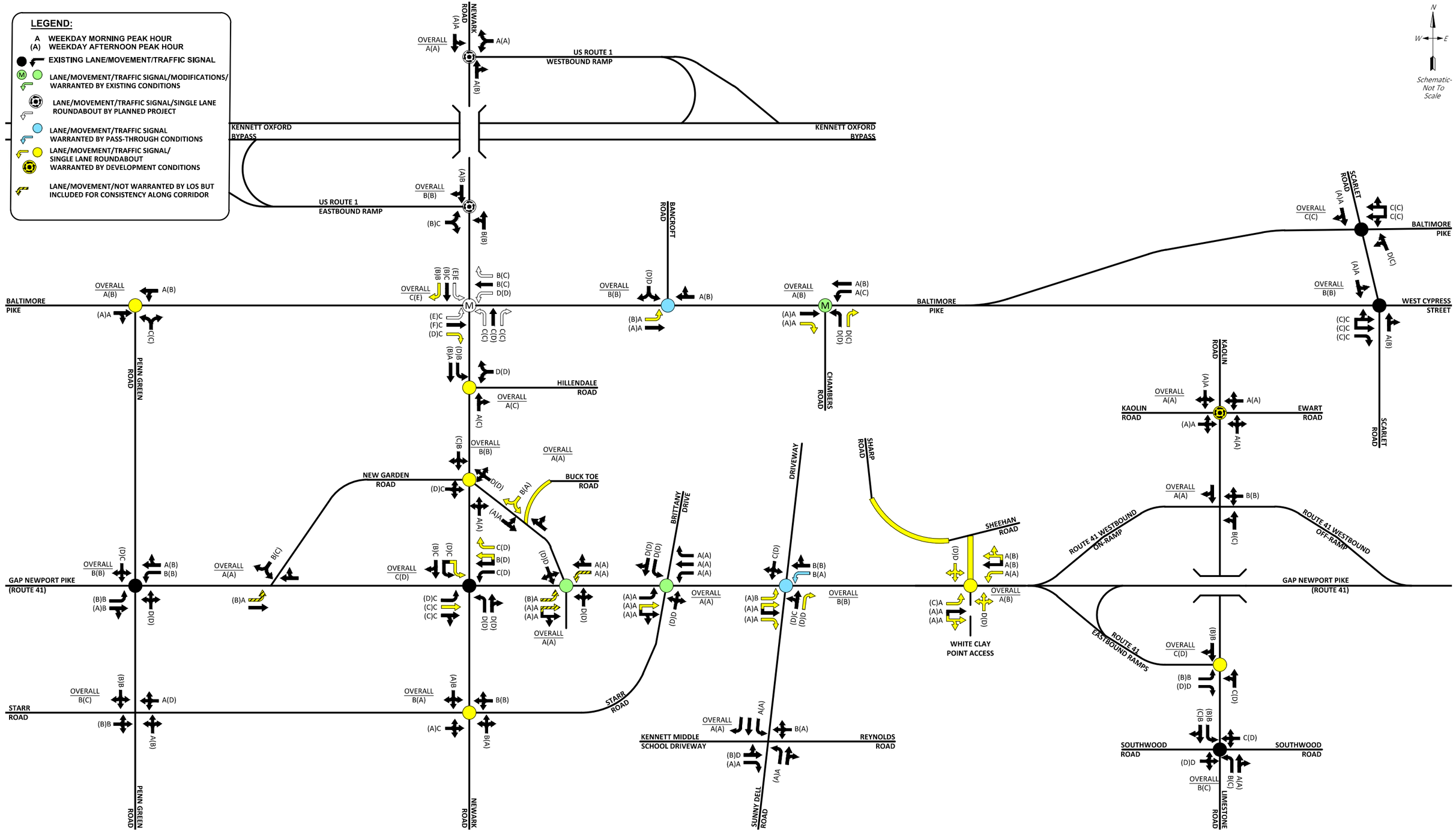

FIGURE 11

2035 Future Development Peak Hour Levels of Service - Improvements

ACT 209 STUDY

NEW GARDEN TOWNSHIP, CHESTER COUNTY, PA

Bowman

Q:\PA-EXTO-MC\mcm\eng\NEWGARD1\313674 - Act 209\Traffic\Graphics\2024-05 Act 209\Figure 11.dwg