Roadway Sufficiency Analysis

East Whiteland Township, Chester County, PA

Prepared by
McMahon Associates, Inc.
840 Springdale Drive
Exton, PA 19341
610.594.9995

Prepared for
East Whiteland Township

March 14, 2018
McMahon Project Number 816611.11

RESOLUTION 16 – 2018
EAST WHITELAND TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

A RESOLUTION OF EAST WHITELAND TOWNSHIP, CHESTER COUNTY, APPROVING THE ROADWAY SUFFICIENCY ANALYSIS (RSA) REPORT.

WHEREAS, East Whiteland Township passed Resolution #29-2016 appointing members of the Act 209 Transportation Impact Fee Advisory Committee ("TIFAC"); and

WHEREAS, the TIFAC has submitted a Roadway Sufficiency Analysis Report to the Board of Supervisors of East Whiteland Township for the implementation of impact fees for capital improvements; and

WHEREAS, the Board of Supervisors of East Whiteland ("Township") desires to take action on the Roadway Sufficiency Analysis Report.

NOW, THEREFORE BE IT RESOLVED, by the East Whiteland Township Board of Supervisors, this 14th day of March, 2018:

1. The Roadway Sufficiency Analysis Report dated March 14, 2018, and prepared by McMahon Associates, Inc. for the East Whiteland Township TIFAC is hereby approved.

2. This Resolution is enacted in order to comply with the requirements of the Pennsylvania Municipalities Planning Code, and in particularly Section 504-A (d) (1) and (2) of the Code.

RESOLVED AND APPROVED this 14th day of March, 2018.

EAST WHITELAND TOWNSHIP

BOARD OF SUPERVISORS

ATTEST:

By:_____

John B. Nagel, Township Manager

By:_____

Susan Drummond, Chairperson

East Whiteland Township Board of Supervisors

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Introduction

Overview

This *Roadway Sufficiency Analysis* has been prepared in accordance with the requirements set forth in Pennsylvania Act 209 on behalf of East Whiteland Township in 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 they have adopted a municipal transportation impact fee ordinance in accordance with the procedures set forth in the Act.

Impact fees under Act 209 are used to fund improvements in the adopted transportation capital improvements plan that are attributable to new development. 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* referenced in this report are contained in a separate bound document entitled *Roadway Sufficiency Analysis Technical Appendix*, dated March 14, 2018.

Process

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

1. Appointment of a Transportation Advisory Committee (also referred to as a Traffic Impact Fee Advisory Committee) and designation of the geographic area(s) of the municipality that will be subject to the transportation impact fee ordinance. The meeting minutes of the Transportation Advisory Committee are included in **Appendix A**. The Transportation Advisory Committee consisted of the following members appointed by the Township Board of Supervisors:

Deborah Abel	Kerry Jones
Chuck Barbera	Anthony Nichols
Michael Chain	Timothy Phelps
Peter Fixler	Daniel Sevick
Veronica Holmes	

2. Development and adoption of land use assumptions, which estimate future land development within the Township and the designated geographic area known as the Transportation Service Area (TSA), and this future development, combined with existing development are the subject of a roadway sufficiency analysis and transportation capital improvement plan.

3. Completion and approval of a roadway sufficiency analysis for the TSA, identifying traffic deficiencies and needed improvements attributable to existing traffic, future traffic not originating from within the TSA (i.e., pass-through traffic), and future traffic originating from new development within the TSA for a preferred level(s) of service in terms of desired traffic operations during the designated peak hour of study.

4. Development and 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 existing and pass-through traffic deficiencies have been remedied.

5. Adoption of an updated 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 2027 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, capital improvement plan, and impact fees, as changes in the land use assumptions, transportation improvement needs, or funding conditions occur.

Land Use Assumptions

As required by Act 209, a public hearing on the East Whiteland Township *Land Use Assumptions Report,* dated May 2017, as prepared by Thomas Comitta Associates, Inc., was held on May 10, 2017. Subsequently, the Board of Supervisors adopted the *Land Use Assumptions Report* by

resolution on May 10, 2017, and the Board adopted technical corrections to the report on September 13, 2017. A copy of the *Land Use Assumptions Report* is provided in **Appendix B**.

The *Land Use Assumptions Report* identifies the anticipated long-term ultimate development build-out within East Whiteland Township, as well as the projected short-term 2027 build-out. The projected short-term 2027 build-out, which is the basis of this analysis, is summarized below in **Table 1**.

Table 1. Land Use Assumptions Report 2027 Build-out Summary

Land Use Classification	10-Year Build-out Projection
Residential	1,010 dwelling units
Non-Residential	3,450,400 square feet

Existing Transportation Network

This section includes a 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 (TSA) required by the Act 209 legislation.

Transportation Service Areas

Act 209 requires the establishment of specific study boundaries, or TSAs, for evaluation and application of transportation impact fees. By law, the Transportation Service Area is required to be completely contiguous and is limited to a maximum size of seven square miles. Moreover, traffic impact fees are applicable only to development located within the TSA.

The Transportation Advisory Committee established one TSA within East Whiteland Township in accordance with the requirements of Act 209. The contiguous TSA is generally located along the U.S. Route 30 (Lancaster Avenue), S.R. 0401 (Conestoga Road), and S.R. 0029 (Morehall Road) corridors and measures approximately seven square miles. A more definitive delineation of the service area boundaries is included in Appendix B (Map 1 of the *Land Use Assumptions Report*).

Roadway Characteristics

The roadway system in the East Whiteland Township TSA, as illustrated in **Figure 1**. Major regional access to and through the Township is provided via U.S. Route 202, U.S. Route 30 (Lancaster Avenue), the Pennsylvania Turnpike (I-76), S.R. 0401 (Conestoga Road), and S.R. 0029 (Morehall Road). The roadway network shown in Figure 1, including both roadway segments and intersections, constitutes the transportation roadway network analyzed pursuant to Act 209. The operating characteristics of each of the major study roadways are summarized as shown in **Table 2**.

Several other Township roadways also comprise the transportation roadway network of the Township; however, these roadways are generally classified as local roads that provide access to the major arterials and collector roads. In particular, Map 2 in the *Land Use Assumptions Report* depicts the roadway classifications. The *East Whiteland Township Comprehensive Plan* (2016) and *Land Use Assumptions Report* (2017) provide a further description of the existing Township roadway network, as well as other elements of the Township's transportation system, including the Chester Valley Trail and SEPTA transit services.

Table 2. Existing Transportation Network Summary

Roadway	Roadway Classification[1]	Ownership	Posted Speed Limit (mph)[2]
U.S. Route 202	Expressway	State	55
PA Route 29 (Morehall Road)	Major Arterial	State	45
PA Route 30 (Lancaster Avenue)	Major Arterial	State	35 and 45
PA Route 352 (Sproul Road)	Minor Arterial	State	35
PA Route 401 (Conestoga Road)	Minor Arterial	State	35 and 45
PA Route 2011 (Phoenixville Pike) *South of PA Route 30*	Major Collector	State	40
Phoenixville Pike *North of Swedesford Road*	Major Collector	Township	35, 40, and 45
Planebrook Road	Major Collector	Township	35
PA Route 2022 (W. King Road)	Major Collector	State	35
Swedesford Road *Between Township's western border & Bacton Hill Road*	Major Collector	Township	35
Swedesford Road *Between Bacton Hill Road & Planebrook Road/Phoenixville Pike*	Major Collector	State	35
PA Route 1002 (Swedesford Road) *Between Planebrook Road/Phoenixville Pike & Township's eastern border*	Major Collector	State	35 and 45
Old Lincoln Highway	Minor Collector	Township	35
Malin Road	Minor Collector	Township	30
N. Bacton Hill Road	Minor Collector	Township	45
Matthews Road	Minor Collector	Township	35
Yellow Springs Road	Minor Collector	Township	35
Church Road	Local Distributor	Township	25
Hershey Mill Road	Local Distributor	Township	35
Morstein Road	Local Distributor	Township	35
Ravine Road	Local Distributor	Township	25
West Liberty Boulevard	Local Distributor	Private	None
East Liberty Boulevard	Local Distributor	Township	None
Valley Stream Parkway	Local Distributor	Township	None
Mill Lane	Local Distributor	Township	25
Sidley Road	Local Distributor	Township	25
Moores Road	Local Distributor Local *Between Church Rd & Phoenixville Pike*	Township	25

(1) Based on *Land Use Assumptions Report, May 2017*
(2) Based on *East Whiteland Township Code, Chapter 189-7* and speed limit postings

Forty-three (43) study intersections have been selected by the Township to be evaluated and included in the *Roadway Sufficiency Analysis* and *Transportation Capital Improvement Plan*, and include the following intersections, as indicated in **Table 3** and shown in Figure 1**.** The Township maintains coordinated signal systems along U.S. Route 30 (Lancaster Avenue) and S.R. 0029 (Morehall Road), as well as a coordinated traffic adaptive system along (S.R. 0401) Conestoga Road, which improves signal operations along these corridors.

Table 3. Study Intersections

ID No.	Intersection	Current Traffic Control
1	Phoenixville Pike and Ravine Road	Stop Sign
2	Phoenixville Pike and Lancaster Avenue (U.S. Route 30)	Traffic Signal
3	Planebrook Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal
4	Sproul Road (S.R. 0352) and Lancaster Avenue (U.S. Route 30)	Traffic Signal
5	Church Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal
6	Sproul Road (S.R. 0352) and Three Tun Road	Stop Sign
7	Sproul Road (S.R. 0352) and College Avenue	Stop Sign
8	Sproul Road (S.R. 0352) and West King Road	Traffic Signal
9	Frazer Road and West King Road	Stop Sign
10	Hershey Mill Road and West King Road	Stop Sign
11	Morstein Road and West King Road	Stop Sign
12	Ravine Road and West King Road	Stop Sign
13	Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)	Traffic Signal
14	Lindenwood Drive / Matthews Road and Morehall Road (S.R. 0029)	Traffic Signal
15	Swedesford Road and Morehall Road (S.R. 0029)	Traffic Signal
16	Liberty Boulevard and Morehall Road (S.R. 0029)	Traffic Signal
17	Valley Stream Parkway and Morehall Road (S.R. 0029)	Traffic Signal
19	Great Valley Parkway and Morehall Road (S.R. 0029)	Traffic Signal
20	Flat Road / Atwater Drive South and Morehall Road (S.R. 0029)	Traffic Signal
21	Pennsylvania Turnpike Ramps and Morehall Road (S.R. 0029)	Traffic Signal
22	General Warren Boulevard / Atwater Drive North and Morehall Road (S.R. 0029)	Traffic Signal
23	Liberty Boulevard and East Swedesford Road	Traffic Signal
24	Valley Stream Parkway and East Swedesford Road	Traffic Signal
25	Old Lincoln Highway and Old Lancaster Road / Weybridge Road	Traffic Signal
26	Old Lincoln Highway and Lancaster Avenue (U.S. Route 30)	Traffic Signal
27	U.S. Route 202 Ramps and Matthews Drive / Foundry Way	Traffic Signal
28	Conestoga Road (S.R. 0401) and Lancaster Avenue (U.S. Route 30)	Traffic Signal
29	Malin Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal
30	West Liberty Boulevard and West Swedesford Road	Traffic Signal

31	West Liberty Boulevard and Old Morehall Road	Traffic Signal
32	West Swedesford Road / Malin Road and Conestoga Road (S.R. 0401)	Traffic Signal
33	West Swedesford Road and Conestoga Road (S.R. 0401)	Stop Sign
34	Mill Lane and Conestoga Road (S.R. 0401)	Traffic Signal
35	Mill Lane and Swedesford Road	Stop Sign
36	Church Road and Swedesford Road	Stop Sign
37	Moores Road and Conestoga Road (S.R. 0401)	Traffic Signal
38	Moores Road and Church Road	Stop Sign
39	Phoenixville Pike and Conestoga Road (S.R. 0401)	Traffic Signal
40	Bacton Hill Road / Whispering Woods Lane and Conestoga Road (S.R. 0401)	Stop Sign
41	Craig Lane / Moores Road and Phoenixville Pike	Stop Sign
42	Swedesford Road and Phoenixville Pike / Planebrook Road	Traffic Signal
43	Bacton Hill Road and Swedesford Road	Stop Sign
44	Phoenixville Pike and Yellow Springs Road / Sidley Road	Traffic Signal

Note: There is no intersection labeled "18"

Existing Traffic Volumes

Traffic operating conditions are influenced by the relationships between traffic volumes and the service capacities of the roadways or intersections. In order to evaluate existing traffic conditions, manual turning movement traffic counts were conducted at each of the 43 study intersections during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon (4:00 PM to 6:00 PM) peak periods. The actual traffic counts are provided in **Appendix C**.

These traffic counts were tabulated by fifteen-minute periods to establish the four highest consecutive 15-minute periods, which constitute the peak hours, and serve as the basis for this analysis. It is noted that the Transportation Advisory Committee has selected the weekday afternoon peak hour as the basis of this *Roadway Sufficiency Analysis*, and as such, **Figure 2** illustrates the existing weekday afternoon peak hour traffic volumes at the study intersections. The weekday morning peak hour traffic volumes and associated analysis for existing, pass-through and development conditions is provided in the appendix of this report.

Existing Transportation Conditions

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 during the peak period.

Analysis Methodology

The peak hour traffic volumes shown in Figure 2 were analyzed to determine the existing operating conditions, in accordance with the standard techniques contained in the *Highway Capacity Manual (6th Edition)*. These standard capacity/level-of-service analysis techniques, which calculate total control delay, are more thoroughly described in **Appendix D** for both signalized and unsignalized intersections, as well the correlation between average total control delay and the respective level of service (LOS) criteria for each intersection type.

Preferred Levels of Service

Consistent with the Act 209 legislation, the Transportation Advisory Committee 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*. Capacity improvements are identified for any deficient (worsened) operations that do not satisfy the preferred levels of service at the study intersections.

According to Act 209, the preferred level of service may be waived by the municipality at individual intersections based upon difficulty in implementing various improvements (i.e. geometric design limitations, topographic limitations, or the unavailability of necessary right-of-way). For unsignalized intersections where the preferred level of service criterion is not satisfied, signalization is often identified as an improvement to mitigate the deficiencies. However, signalization is only permissible if PennDOT's traffic signal warrant criteria are met. As a result, the signalization improvement may 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	TSA
Signalized	**LOS E** movements **LOS D** overall
Unsignalized	**LOS E** movements **LOS D** overall

For all study intersections, the preferred levels of service indicated above apply to individual movements, as well as overall intersection operations.

The Transportation Advisory Committee identified some improvements which were necessary to achieve the preferred level-of-service, but were deemed infeasible and/or inconsistent with Township's vision. These improvements are represented with hatched arrows on the improvement figures for the Existing, Pass-Through, and Development conditions (see Figures 4, 7, and 10, respectively), and are not included in the Transportation Capital Improvement Plan. The improvements are shown on the figures for informational purposes only.

Additionally, some improvements identified to achieve the preferred level-of-serve were deemed infeasible due to exorbitant cost, property impacts, and structural impacts. Based on recommendations from the Transportation Advisory Committee, these improvements are also not included in the Transportation Capital Improvement Plan.

The East Whiteland Township *Comprehensive Plan Update* (2016) presents the vision for consistent future cross sections of the U.S. Route 30 and S.R. 0029 corridors in the Township. Improvements that would require widening of U.S. Route 30 or S.R. 0029 beyond the vision presented in the *Comprehensive Plan* are not included in the Transportation Capital Improvement Plan. The vision for these corridors include the following:

- U. S. Route 30 Corridor: Two through travel lanes in each direction and a center-turn lane.
- S.R. 0029 Corridor: Three through travel lanes in each direction.

Conversely, in order to achieve the Township's vision documented in the *Comprehensive Plan* for consistent future cross sections on U. S. Route 30 and S. R. 0029, some additional travel lanes that are not required to achieve the preferred level-of-service are shown on the Development improvement figure. These improvements are represented with hollow red arrows and are not included in the Transportation Capital Improvement Plan. The improvements are shown on the figure for informational purposes only.

Programmed Improvements

The following improvements have previously been planned for and committed to for various East Whiteland Township roadways and intersections, which will directly affect traffic operations:

- **S.R. 0029 (Morehall Road):** As part of the Uptown Worthington development, a highway occupancy permit has been issued to provide a third northbound S.R. 0029 (Morehall Road) through lane through the intersections with Matthews Road and Swedesford Road via restriping of the roadway. It is anticipated that this improvement will be constructed by the 2027 horizon year.

- **U.S. Route 30 Adaptive Traffic Control System:** The Township is currently designing and implementing an adaptive traffic control system along the entire U.S. Route 30 corridor within the Township. It is anticipated that this system will be operational by the 2027 horizon year. Due to the nature of adaptive traffic control systems, any traffic signal timing changes necessary to achieve the preferred level-of-service were not considered as improvements in future traffic operations analysis, as the system will be more flexible to adjust timings to changing traffic conditions.

Existing Levels of Service

The existing weekday peak hour traffic volumes presented in Figure 2 were subject to detailed capacity/level-of-service analysis according to the methodology previously described. The results of the analysis are illustrated in **Figure 3**, and the detailed capacity/level-of-service analysis worksheets are contained in **Appendix E**. In addition, for informational purposes, the existing weekday morning peak hour traffic volumes and level-of-service analysis worksheets are also contained in Appendix E.

As shown in Figure 3, 28 of the 43 study intersections presently operate with acceptable levels of service with respect to the adopted preferred levels of service during the weekday afternoon peak hour. The remaining 15 study intersections do not satisfy the preferred levels of service criteria. The following signalized intersections operate below LOS E for at least one movement:

- West Swedesford Road and Planebrook Road / Phoenixville Pike
- Lancaster Avenue (U.S. Route 30) and Sproul Road (S.R. 0352)
- Lancaster Avenue (U.S. Route 30) and Conestoga Road (S.R. 0401)
- Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)
- Lancaster Avenue (U.S. Route 30) and Old Lincoln Highway
- Old Lincoln Highway and Old Lancaster Road / Weybridge Drive
- Conestoga Road (S.R. 0401) and Malin Road / Swedesford Road
- Conestoga Road (S.R. 0401) and Moores Road
- Morehall Road (S.R. 0029) and Lindenwood Drive / Matthews Road

- Matthews Road and Foundry Drive / U.S. Route 202 Ramps
- Morehall Road (S.R. 0029) and Swedesford Road
- Morehall Road (S.R. 0029) and Valley Stream Parkway
- Morehall Road (S.R. 0029) and Great Valley Parkway
- Morehall Road (S.R. 0029) and General Warren Boulevard / Atwater Drive North
- Sproul Road (S.R. 0352) and West King Road

Existing Improvement Plan

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 4**. Improvements are required at 15 study intersections within the TSA in order to achieve the preferred levels of service under present traffic conditions.

Table 5. Existing Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
1	Phoenixville Pike and Ravine Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
2	Phoenixville Pike and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
3	Planebrook Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
4	Sproul Road (S.R. 0352) and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen eastbound Lancaster Avenue (U.S. Route 30) to provide a right-turn lane. Modify traffic signal timings.
5	Church Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
6	Sproul Road (S.R. 0352) and Three Tun Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
7	Sproul Road (S.R. 0352) and College Avenue	Stop Sign	No improvements required to achieve the preferred levels-of-service.
8	Sproul Road (S.R. 0352) and West King Road	Traffic Signal	Modify traffic signal timings.
9	Frazer Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
10	Hershey Mill Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
11	Morstein Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
12	Ravine Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
13	Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.
14	Lindenwood Drive / Matthews Road and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.
15	Swedesford Road and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.
16	Liberty Boulevard and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.
17	Valley Stream Parkway and Morehall Road (S.R. 0029)	Traffic Signal	Widen westbound Valley Stream Parkway to provide an additional right-turn lane. Modify traffic signal timings.
19	Great Valley Parkway and Morehall Road (S.R. 0029)	Traffic Signal	Restripe the eastbound Great Valley Parkway approach to provide a left, left-through, and right-turn lane. Modify traffic signal timings.
20	Flat Road / Atwater Drive South and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.
21	Pennsylvania Turnpike Ramps and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.

Table 5. Existing Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
22	General Warren Boulevard / Atwater Drive North and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.
23	Liberty Boulevard and East Swedesford Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
24	Valley Stream Parkway and East Swedesford Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
25	Old Lincoln Highway and Old Lancaster Road / Weybridge Road	Traffic Signal	Modify traffic signal timings.
26	Old Lincoln Highway and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Modify traffic signal timings.
27	U.S. Route 202 Ramps and Matthews Drive / Foundry Way	Traffic Signal	Modify traffic signal timings.
28	Conestoga Road (S.R. 0401) and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Modify traffic signal timings.
29	Malin Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
30	West Liberty Boulevard and West Swedesford Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
31	West Liberty Boulevard and Old Morehall Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
32	West Swedesford Road / Malin Road and Conestoga Road (S.R. 0401)	Traffic Signal	Modify traffic signal timings.
33	West Swedesford Road and Conestoga Road (S.R. 0401)	Stop Sign	No improvements required to achieve the preferred levels-of-service.
34	Mill Lane and Conestoga Road (S.R. 0401)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
35	Mill Lane and Swedesford Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
36	Church Road and Swedesford Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
37	Moores Road and Conestoga Road (S.R. 0401)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
38	Moores Road and Church Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
39	Phoenixville Pike and Conestoga Road (S.R. 0401)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
40	Bacton Hill Road / Whispering Woods Lane and Conestoga Road (S.R. 04	Stop Sign	No improvements required to achieve the preferred levels-of-service.
41	Craig Lane / Moores Road and Phoenixville Pike	Stop Sign	No improvements required to achieve the preferred levels-of-service.
42	Swedesford Road and Phoenixville Pike / Planebrook Road	Traffic Signal	Modify traffic signal timings.
43	Bacton Hill Road and Swedesford Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
44	Phoenixville Pike and Yellow Springs Road / Sidley Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.

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 East Whiteland Township Act 209 traffic analysis, which is consistent with the short-term development projections contained in the *Land Use Assumptions Report*, and which produces a forecast year of 2027.

Future Traffic Components

Total future traffic volume forecasts for 2027 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 reflects future increases in regional traffic. This includes traffic generated by specific approved future developments located within East Whiteland Township, as outlined in the *Land Use Assumptions Report*, as well as a regional background traffic growth factor of 0.5 percent per year, compounded for 10 years to 2027 (or 5.64 percent total).

Development traffic that is generated by new development within the designated Transportation Service Area constitutes the third and final component of future 2027 traffic volumes, and it is 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 2027 weekday afternoon peak hour utilizing the Institute of Transportation Engineers publication, ***Trip Generation, 9th Edition***. The resulting 2027 weekday afternoon peak hour trip generation is summarized in **Table 6** the TSA. In addition, the detailed trip generation estimates are shown in **Appendix F**.

Table 6. Future Weekday Afternoon Peak Hour Trip Generation for the Transportation Service Area (1)

Pass-Through (2) New Trips	Development New Trips	Total New Trips
5,248 trips	6,575 trips	11,823 trips

(1) Based on the *Land Use Assumptions Report*.
(2) Exclusive of regional background growth.

Trip Distribution

Vehicular traffic volumes generated by new development over the next 10 years were generally distributed to the area roadway network based on existing travel patterns determined from the existing peak hour traffic volumes entering and exiting the Township, as well as the location of specific future developments with respect to the study roadway network and other major traffic generators and destinations. The resultant overall directions of approach and departure are indicated in **Table 7**.

Table 7. Directions of Approach and Departure
Transportation Service Area Development

Roadway	External Location (to/from)	Arrival/Departure
U.S. Route 202	western edge of Township	12 %
U.S. Route 202	eastern edge of Township	15 %
PA Route 29	north of General Warren Boulevard	11 %
U.S. Route 30	west of Phoenixville Pike	8 %
U.S. Route 30	east of Old Lincoln Highway	10 %
Pennsylvania Turnpike	the west and east	6 %
Conestoga Road (S.R. 0401)	west of Bacton Hill Road	6 %
Phoenixville Pike	north of Sidley Road	6 %
Phoenixville Pike	west of Ravine Road	2 %
Swedesford Road	east of Valley Stream Parkway	6 %
Swedesford Road	west of Bacton Hill Road	3 %
West King Road	west of Ravine Road	2 %
West King Road	east of Sproul Road (S.R. 0352)	3 %
Sproul Road (S.R. 0352)	south of West King Road	3 %
Old Lincoln Highway	south of Old Lancaster Road	3 %
Old Lancaster Road	west of Old Lincoln Highway	2 %
Yellow Springs Road	west of Phoenixville Pike	2 %

2027 Future Pass-Through Traffic

Traffic generated by approved land developments identified in the *Land Use Assumptions Report* were included in the future pass-through traffic projections. This traffic was generally assigned to the study intersections based on the trip distribution assumptions previously described. Also, an annual traffic growth rate of one half of one percent per year was applied to the existing peak hour traffic volumes to reflect regional traffic growth.

The 2027 future pass-through weekday afternoon peak hour traffic volumes are illustrated in **Figure 5**.

2027 Future Pass-Through Traffic Levels of Service

The future 2027 pass-through traffic volumes illustrated in Figure 5 were subject to the previously described capacity/level-of-service analysis procedures to determine 2027 pass-through levels of service, and the detailed analyses are provided in **Appendix G**. In addition, for informational purposes, the pass-though weekday morning peak hour traffic volumes and level-of-service analysis worksheets are also contained in Appendix G. As required by Act 209, the future conditions analysis was completed for future 2027 pass-through volumes for each study intersection, assuming implementation of the improvements identified in the Existing Improvement Plan, in order to determine the incremental traffic impacts and required mitigation of future pass-through traffic. The future conditions analysis also assumes completion of the previously described programmed improvements.

Figure 6 summarizes the results of the 2027 future pass-through traffic capacity/level-of-service analyses for the study intersections. Traffic operating conditions at the following study intersections will not satisfy the preferred level of service criteria under 2027 future pass-through conditions.

- Swedesford Road and Bacton Hill Road
- Swedesford Road and Phoenixville Pike / Planebrook Road
- Conestoga Road (S.R. 0401) and Bacton Hill Road
- Conestoga Road (S.R. 0401) and Phoenixville Pike
- Conestoga Road (S.R. 0401) and Swedesford Road / Malin Road
- Lancaster Avenue (U.S. Route 30) and Sproul Road (S.R. 0352)
- Lancaster Avenue (U.S. Route 30) and Church Road
- Lancaster Avenue (U.S. Route 30) and Conestoga Road (S.R. 0401)
- Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)
- Lancaster Avenue (U.S. Route 30) and Old Lincoln Highway
- Old Lincoln Highway and Old Lancaster Road / Weybridge Road
- Matthews Road and Foundry Way / U.S. Route 202 Ramps
- Morehall Road (S.R. 0029) and Swedesford Road
- Morehall Road (S.R. 0029) and Liberty Boulevard
- Morehall Road (S.R. 0029) and Valley Stream Parkway
- Morehall Road (S.R. 0029) and Great Valley Parkway
- Morehall Road (S.R. 0029) and Flat Road / Atwater Drive South
- Morehall Road (S.R. 0029) and Pennsylvania Turnpike Ramps
- Morehall Road (S.R. 0029) and General Warren Boulevard / Atwater Drive North
- Swedesford Road and West Liberty Boulevard
- Swedesford Road and Church Road
- Sproul Road (S.R. 0352) and West King Road
- Phoenixville Pike and Sidley Road / Yellow Springs Road

2027 Future Pass-Through Improvement Plan

The additional improvements required (beyond those improvements necessary to accommodate existing traffic) to accommodate pass-through traffic at the preferred levels of service are illustrated in **Figure 7,** and are summarized in more detail in **Table 8** for each study intersection. Improvements are required at twenty-three study intersections, in order to achieve the preferred levels of service.

2027 Future Development Traffic

As previously explained, the traffic generated by new development internal to the designated Transportation Service Area constitutes the third and final component of future 2027 traffic. The 2027 future development traffic volumes were determined based on assignment of development traffic within the Transportation Service Area, and were added to 2027 future pass-through traffic volumes. Assignment of the development trip generation to the study intersections results in 2027 future development traffic volumes, which are illustrated in **Figure 8**.

Table 8. Pass-Through Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
1	Phoenixville Pike and Ravine Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
2	Phoenixville Pike and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
3	Planebrook Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
4	Sproul Road (S.R. 0352) and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen northbound Sproul Road (S.R. 0352) to provide a separate left-turn lane. Modify traffic signal phasing.
5	Church Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen westbound Lancaster Avenue (U.S. Route 30) to provide a right-turn lane.
6	Sproul Road (S.R. 0352) and Three Tun Road	Stop Sign	No improvements warranted.
7	Sproul Road (S.R. 0352) and College Avenue	Stop Sign	No improvements required to achieve the preferred levels-of-service.
8	Sproul Road (S.R. 0352) and West King Road	Traffic Signal	Widen northbound and southbound Sproul Road (S.R. 0352) to provide left-turn lanes. Modify traffic signal phasing.
9	Frazer Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
10	Hershey Mill Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
11	Morstein Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
12	Ravine Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
13	Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)	Traffic Signal	Improvements were identified to achieve the preferred levels-of-service but are not included in the TCIP.
14	Lindenwood Drive / Matthews Road and Morehall Road (S.R. 0029)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
15	Swedesford Road and Morehall Road (S.R. 0029)	Traffic Signal	Widen northbound Morehall Road (S.R. 0029) to provide an additional left-turn lane. Widen southbound Morehall Road (S.R. 0029) to provide an additional through lane. Modify traffic signal timings.
16	Liberty Boulevard and Morehall Road (S.R. 0029)	Traffic Signal	Widen westbound Valley Stream Parkway to provide an additional right-turn lane. Modify traffic signal phasing.
17	Valley Stream Parkway and Morehall Road (S.R. 0029)	Traffic Signal	Widen northbound and southbound Morehall Road (S.R. 0029) to provide an additional through lane. Modify traffic signal timings.
19	Great Valley Parkway and Morehall Road (S.R. 0029)	Traffic Signal	Widen northbound Morehall Road (S.R. 0029) to provide an additional through lane. Widen westbound Great Valley Parkway to provide a right-turn lane. Widen eastbound Great Valley Parkway to provide an additional left-turn lane. Modify traffic signal.
20	Flat Road / Atwater Drive South and Morehall Road (S.R. 0029)	Traffic Signal	Widen northbound Morehall Road (S.R. 0029) to provide an additional through lane. Modify traffic signal timings.
21	Pennsylvania Turnpike Ramps and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal timings.

Table 8. Pass-Through Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
22	General Warren Boulevard / Atwater Drive North and Morehall Road (S.R. 0029)	Traffic Signal	Widen northbound Morehall Road (S.R. 0029) to provide an additional through lane. Modify traffic signal timings.
23	Liberty Boulevard and East Swedesford Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
24	Valley Stream Parkway and East Swedesford Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
25	Old Lincoln Highway and Old Lancaster Road / Weybridge Road	Traffic Signal	Widen southbound Old Lincoln Highway to provide a right-turn lane. Modify traffic signal timings.
26	Old Lincoln Highway and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen Lancaster Avenue (U.S. Route 30) to provide an additional right-turn lane. Modify traffic signal phasing.
27	U.S. Route 202 Ramps and Matthews Drive / Foundry Way	Traffic Signal	Widen the southbound U.S. Route 202 Ramp approach to provide an additional left-turn lane. Widen the northbound Foundry Way approach to provide an additional left-turn lane. Widen the westbound Matthews Road approach to provide an additional right-turn lane. Modify traffic signal phasing.
28	Conestoga Road (S.R. 0401) and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen southbound Conestoga Road (S.R. 0401) to provide a separate left-turn lane.
29	Malin Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required or recommended.
30	West Liberty Boulevard and West Swedesford Road	Traffic Signal	Widen westbound Swedesford Road to provide an additional through lane. Modify traffic signal timings.
31	West Liberty Boulevard and Old Morehall Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
32	West Swedesford Road / Malin Road and Conestoga Road (S.R. 0401)	Traffic Signal	Modify traffic signal timings.
33	West Swedesford Road and Conestoga Road (S.R. 0401)	Stop Sign	No improvements required to achieve the preferred levels-of-service.
34	Mill Lane and Conestoga Road (S.R. 0401)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
35	Mill Lane and Swedesford Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
36	Church Road and Swedesford Road	Stop Sign	Install a traffic signal.
37	Moores Road and Conestoga Road (S.R. 0401)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
38	Moores Road and Church Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
39	Phoenixville Pike and Conestoga Road (S.R. 0401)	Traffic Signal	Widen westbound Conestoga Road (S.R. 0401) and restripe the existing right-turn lane as through-right.
40	Bacton Hill Road / Whispering Woods Lane and Conestoga Road (S.R. 0401)	Stop Sign	Install a traffic signal.
41	Craig Lane / Moores Road and Phoenixville Pike	Stop Sign	No improvements required to achieve the preferred levels-of-service.
42	Swedesford Road and Phoenixville Pike / Planebrook Road	Traffic Signal	Modify traffic signal timings.
43	Bacton Hill Road and Swedesford Road	Stop Sign	Install a traffic signal.
44	Phoenixville Pike and Yellow Springs Road / Sidley Road	Traffic Signal	Modify traffic signal timings.

2027 Future Development Traffic Levels of Service

The future development traffic volumes presented in Figure 8 were subject to the previously described capacity/level-of-service analysis procedures to determine future 2027 development levels of service, and the detailed analyses are provided in **Appendix H**. In addition, for informational purposes, the development weekday morning peak hour traffic volumes and level-of-service analysis worksheets are also contained in Appendix H. The 2027 future development conditions are illustrated in **Figure 9**, and indicate that the following 29 study intersections will not satisfy the preferred levels of service criteria and require further improvements beyond the previously identified existing conditions improvements, programmed/committed improvements, and future pass-through improvements.

- Swedesford Road and Bacton Hill Road
- Swedesford Road and Phoenixville Pike / Planebrook Road
- Conestoga Road (S.R. 0401) and Bacton Hill Road
- Conestoga Road (S.R. 0401) and Phoenixville Pike
- Conestoga Road (S.R. 0401) and Moores Road
- Conestoga Road (S.R. 0401) and Malin Road / Swedesford Road
- Lancaster Avenue (U.S. Route 30) and Phoenixville Pike
- Lancaster Avenue (U.S. Route 30) and Planebrook Road
- Lancaster Avenue (U.S. Route 30) and Sproul Road (S.R. 0352)
- Lancaster Avenue (U.S. Route 30) and Church Road
- Lancaster Avenue (U.S. Route 30) and Malin Road
- Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)
- Lancaster Avenue (U.S. Route 30) and Old Lincoln Highway
- Old Lincoln Highway and Old Lancaster Road / Weybridge Drive
- Sproul Road (S.R. 0352) and Three Tun Road
- Sproul Road (S.R. 0352) and College Avenue
- Sproul Road (S.R. 0352) and West King Road
- Swedesford Road and Church Road
- Phoenixville Pike and Moores Road / Craig Lane
- Matthews Road and Foundry Way / U.S. Route 202 Ramps
- East Swedesford Road and East Liberty Boulevard
- West Swedesford Road and West Liberty Boulevard
- Morehall Road (S.R. 0029) and Swedesford Road
- Morehall Road (S.R. 0029) and Liberty Boulevard
- Morehall Road (S.R. 0029) and Valley Stream Parkway
- Morehall Road (S.R. 0029) and Great Valley Parkway
- Morehall Road (S.R. 0029) and Flat Road / Atwater Drive South
- Morehall Road (S.R. 0029) and Pennsylvania Turnpike Ramps
- Morehall Road (S.R. 0029) and General Warren Boulevard / Atwater Drive North
- Phoenixville Pike and Sidley Road / Yellow Springs Road

2027 Future Development Improvement Plan

The improvements necessary to achieve the preferred level of service criteria under 2027 development traffic conditions at the study intersections are summarized in **Table 9**, and are also illustrated in **Figure 10**. In summary, improvements are required at 29 study intersections to accommodate development-generated traffic within the Transportation Service Area in order to achieve the preferred levels of service.

Lastly, it is noted that other roadway and intersection improvements beyond those identified herein may be required in the future due to land developments that may occur with greater intensity and thereby greater traffic impacts than estimated and assumed for this study. Also, existing safety or maintenance issues along a roadway segment or at an intersection may need to be addressed when a development is proposed nearby. As such, traffic impact studies completed for these developments should be prepared to determine if additional improvements are necessary beyond the identified Act 209 improvements.

Table 9. Development Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
1	Phoenixville Pike and Ravine Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
2	Phoenixville Pike and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen westbound and eastbound Lancaster Avenue (U.S. Route 30) to provide an additional through lane. Restripe the existing eastbound right-turn lane as through/right-turn lane. Modify traffic signal.
3	Planebrook Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen westbound Lincoln Highway (U.S. Route 30) to provide an additional through lane. Restripe the eastbound right-turn lane as through/right. Modify traffic signal.
4	Sproul Road (S.R. 0352) and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen eastbound and westbound Lancaster Avenue (U.S. Route 30) to provide an additional through lane. Modify traffic signal. Additional improvements were identified to achieve the preferred level-of-service but were not included in the TCIP.
5	Church Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Widen eastbound and westbound Lancaster Avenue (U.S. Route 30) to provide an additional through lane. Widen southbound Church Road to provide a right-turn lane. Modify traffic signal.
6	Sproul Road (S.R. 0352) and Three Tun Road	Stop Sign	Install a traffic signal.
7	Sproul Road (S.R. 0352) and College Avenue	Stop Sign	Install a traffic signal.
8	Sproul Road (S.R. 0352) and West King Road	Traffic Signal	Widen eastbound West King Road to provide a left-turn lane. Modify traffic signal phasing.
9	Frazer Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
10	Hershey Mill Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
11	Morstein Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
12	Ravine Road and West King Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
13	Lancaster Avenue (U.S. Route 30) and Morehall Road (S.R. 0029)	Traffic Signal	Improvements were identified to achieve the preferred levels-of-service but are not included in the TCIP.
14	Lindenwood Drive / Matthews Road and Morehall Road (S.R. 0029)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
15	Swedesford Road and Morehall Road (S.R. 0029)	Traffic Signal	Widen eastbound Swedesford Road to provide an additional through lane and an additional left-turn lane. Widen northbound Morehall Road (S.R. 0029) to provide an additional right-turn lane. Widen westbound Swedesford Road to provide an additional through lane. Modify traffic signal. Additional improvements were identified to achieve the preferred level-of-service but were not included in the TCIP.
16	Liberty Boulevard and Morehall Road (S.R. 0029)	Traffic Signal	Widen southbound Morehall Road (S.R. 0029) to provide an additional through lane. Modify traffic signal.
17	Valley Stream Parkway and Morehall Road (S.R. 0029)	Traffic Signal	Widen westbound Valley Stream Parkway to provide an additional left-turn lane. Modify traffic signal. Additional improvements were identified to achieve the preferred level-of-service but were not included in the TCIP.

Table 9. Development Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
19	Great Valley Parkway and Morehall Road (S.R. 0029)	Traffic Signal	Additional improvements were identified to achieve the preferred level-of-service but were not included in the TCIP.
20	Flat Road / Atwater Drive South and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal. Additional improvements were identified to achieve the preferred level-of-service but were not included in the TCIP.
21	Pennsylvania Turnpike Ramps and Morehall Road (S.R. 0029)	Traffic Signal	Widen northbound Morehall Road (S.R. 0029) to provide an additional through lane. Modify traffic signal. Additional improvements were identified to achieve the preferred level-of-service but were not included in the TCIP.
22	General Warren Boulevard / Atwater Drive North and Morehall Road (S.R. 0029)	Traffic Signal	Modify traffic signal.
23	Liberty Boulevard and East Swedesford Road	Traffic Signal	Restripe the inside northbound through lane to provide dual northbound left-turn lanes. Modify traffic signal phasing and timings.
24	Valley Stream Parkway and East Swedesford Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
25	Old Lincoln Highway and Old Lancaster Road / Weybridge Road	Traffic Signal	Modify traffic signal timings.
26	Old Lincoln Highway and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Improvements were identified to achieve the preferred levels-of-service but are not included in the TCIP.
27	U.S. Route 202 Ramps and Matthews Drive / Foundry Way	Traffic Signal	Modify traffic signal timings.
28	Conestoga Road (S.R. 0401) and Lancaster Avenue (U.S. Route 30)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
29	Malin Road and Lancaster Avenue (U.S. Route 30)	Traffic Signal	Improvements were identified to achieve the preferred levels-of-service but are not included in the TCIP.
30	West Liberty Boulevard and West Swedesford Road	Traffic Signal	Reconfigure the outside southbound Liberty Boulevard right-turn lane to be an exclusive lane onto the U.S. Route 202 South ramp.
31	West Liberty Boulevard and Old Morehall Road	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
32	West Swedesford Road / Malin Road and Conestoga Road (S.R. 0401)	Traffic Signal	Widen westbound Conestoga Road (S.R. 0401) to provide an additional through lane. Widen northbound Malin Road to provide a left-turn lane. Widen southbound Swedesford Road to provide an additional through lane. Modify traffic signal timings.
33	West Swedesford Road and Conestoga Road (S.R. 0401)	Stop Sign	No improvements required to achieve the preferred levels-of-service.
34	Mill Lane and Conestoga Road (S.R. 0401)	Traffic Signal	No improvements required to achieve the preferred levels-of-service.
35	Mill Lane and Swedesford Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
36	Church Road and Swedesford Road	Traffic Signal	Modify traffic signal timings.
37	Moores Road and Conestoga Road (S.R. 0401)	Traffic Signal	Modify traffic signal phasing.
38	Moores Road and Church Road	Stop Sign	No improvements required to achieve the preferred levels-of-service.
39	Phoenixville Pike and Conestoga Road (S.R. 0401)	Traffic Signal	Widen northbound Phoenixville Pike to provide a right-turn lane.

Table 9. Development Improvements

Int No.	Intersection	Current Traffic Control	Recommended Capacity Improvements
40	Bacton Hill Road / Whispering Woods Lane and Conestoga Road (S.R. 0401)	Traffic Signal	Widen westbound Conestoga Road (S.R. 0401) to provide a left-turn lane. Widen northbound Bacton Hill Road to provide a right-turn lane. Modify traffic signal timings and phasing.
41	Craig Lane / Moores Road and Phoenixville Pike	Stop Sign	Install a traffic signal.
42	Swedesford Road and Phoenixville Pike / Planebrook Road	Traffic Signal	Widen westbound Swedesford Road to provide an additional through lane. Modify traffic signal timings.
43	Bacton Hill Road and Swedesford Road	Traffic Signal	Widen westbound Swedesford Road to provide a right-turn lane. Widen southbound Bacton Hill Road to provide a left-turn lane. Modify traffic signal timings and phasing.
44	Phoenixville Pike and Yellow Springs Road / Sidley Road	Traffic Signal	Widen northbound and southbound Phoenixville Pike to provide left-turn lanes. Widen westbound Sidley Road to provide a left-turn lane. Modify traffic signal timings and phasing.

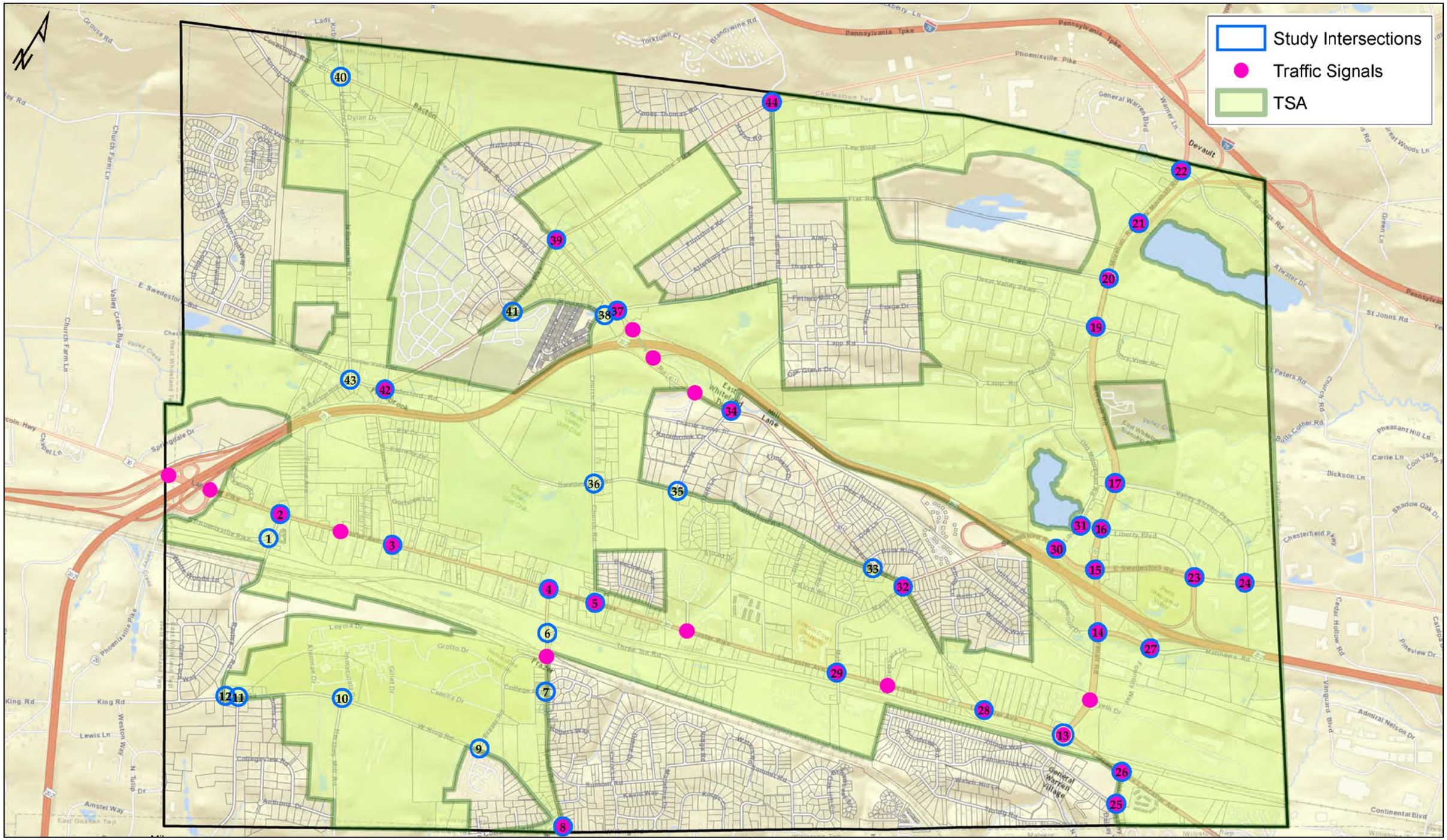

FIGURE 1

Study Roadway Network

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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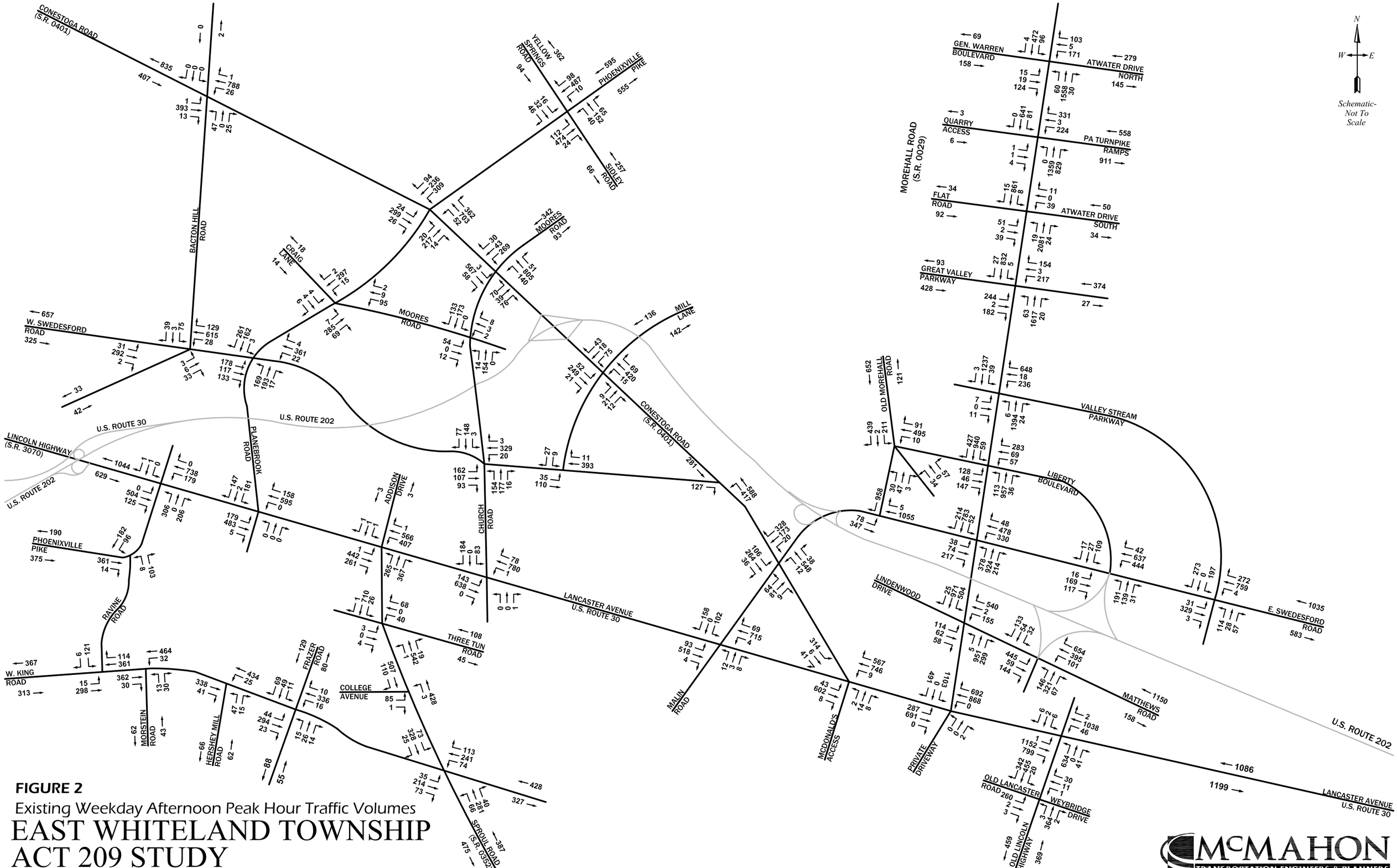

FIGURE 2

Existing Weekday Afternoon Peak Hour Traffic Volumes

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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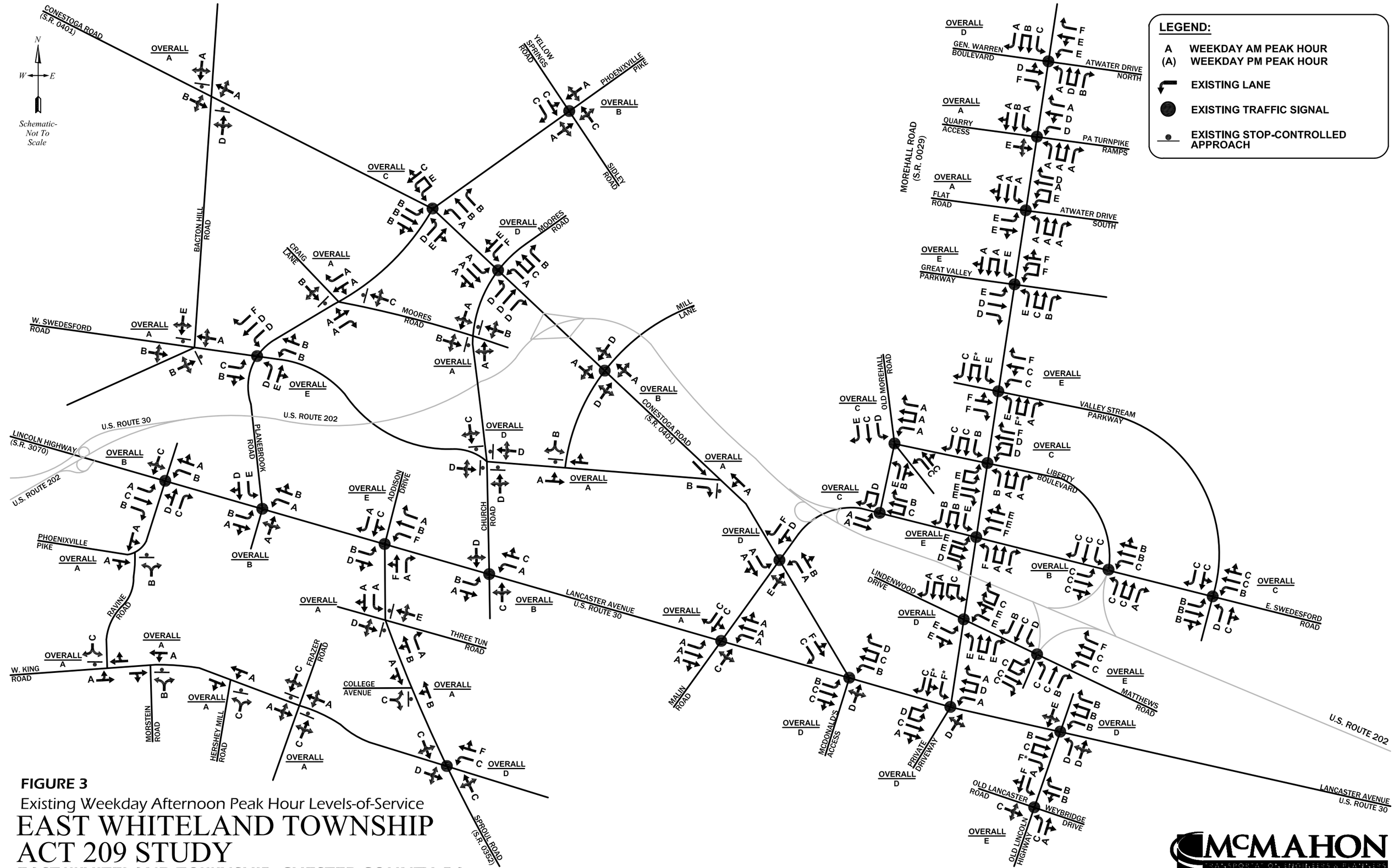

FIGURE 3

Existing Weekday Afternoon Peak Hour Levels-of-Service

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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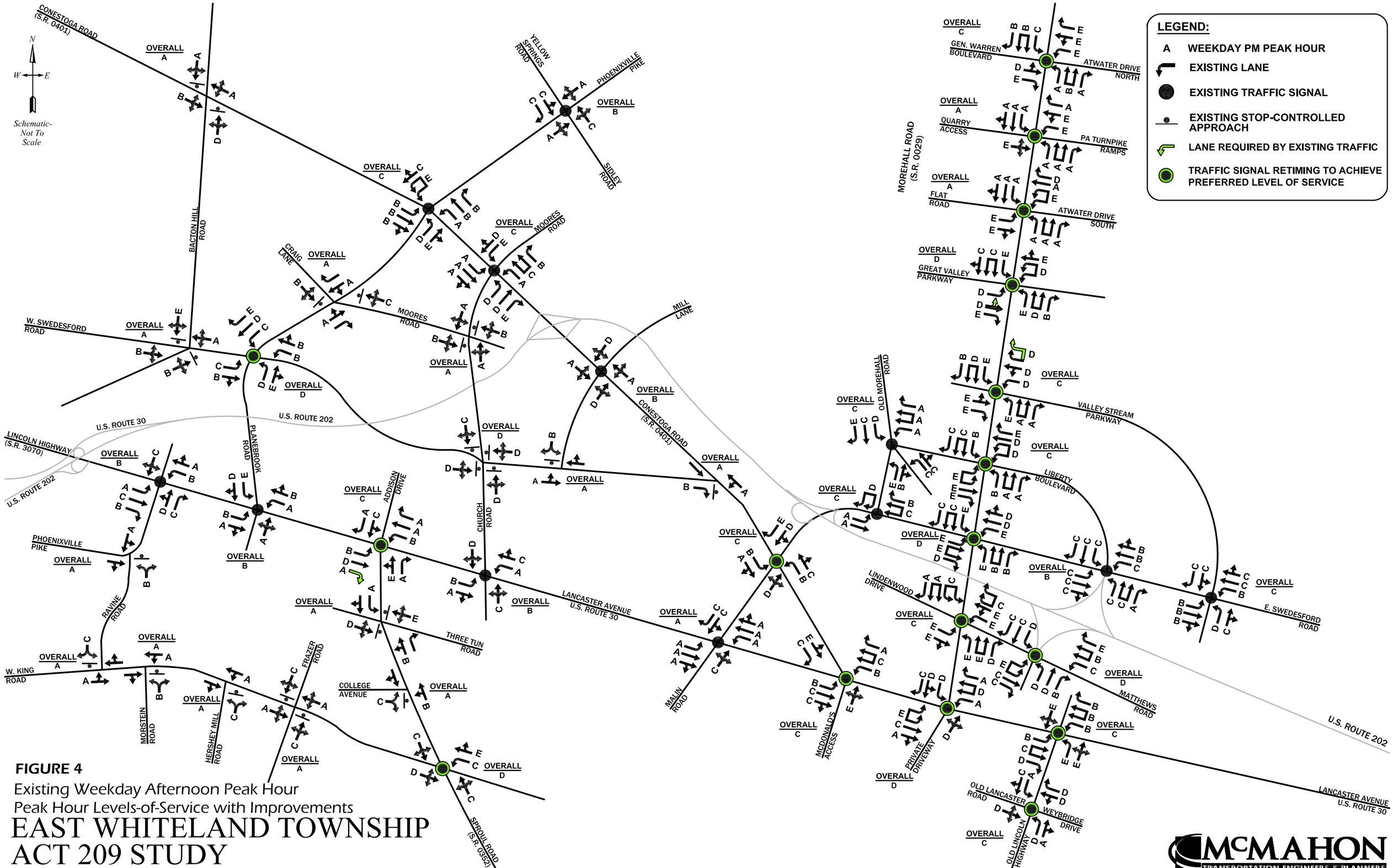

FIGURE 4

Existing Weekday Afternoon Peak Hour
Peak Hour Levels-of-Service with Improvements

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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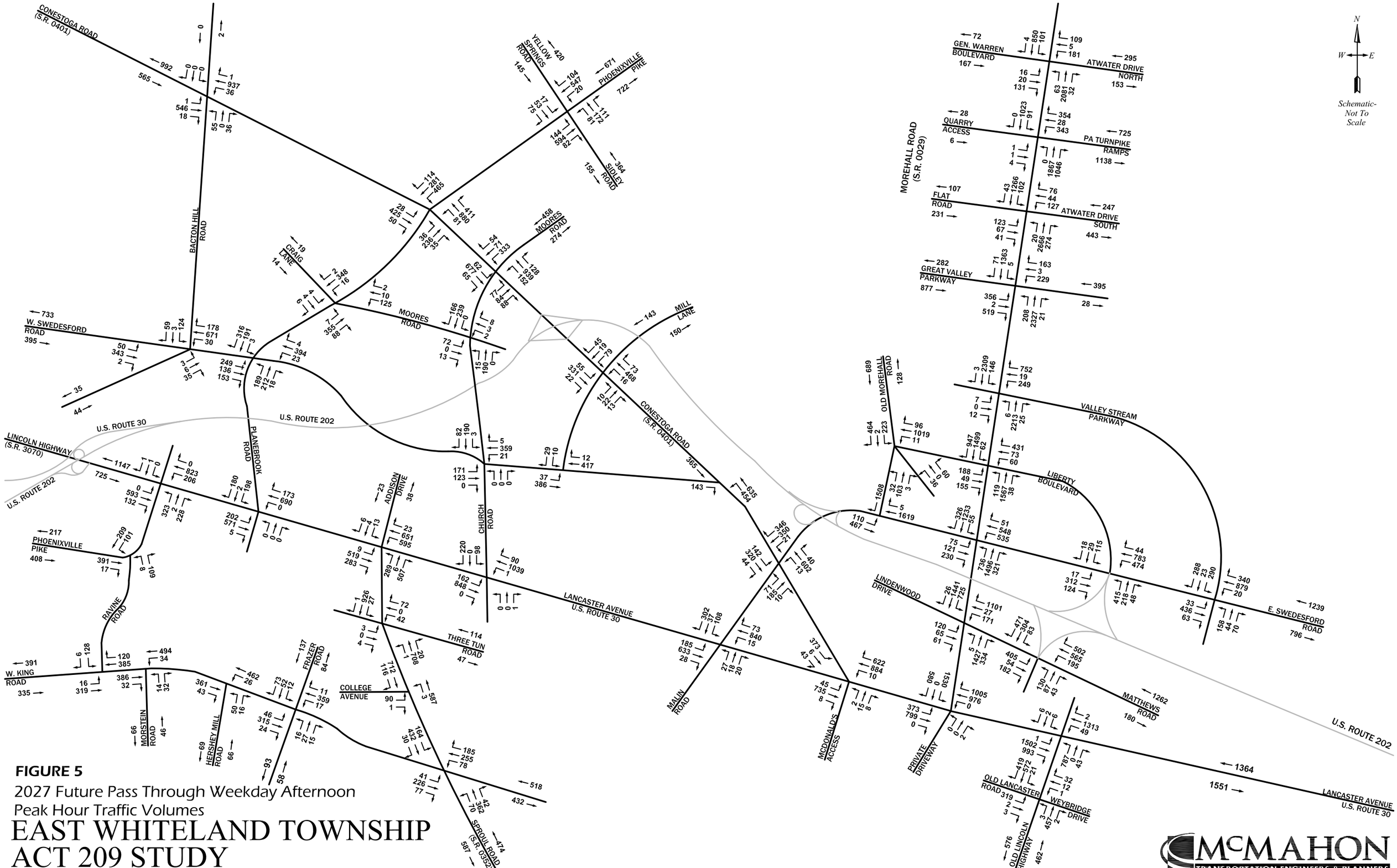

FIGURE 5

2027 Future Pass Through Weekday Afternoon Peak Hour Traffic Volumes

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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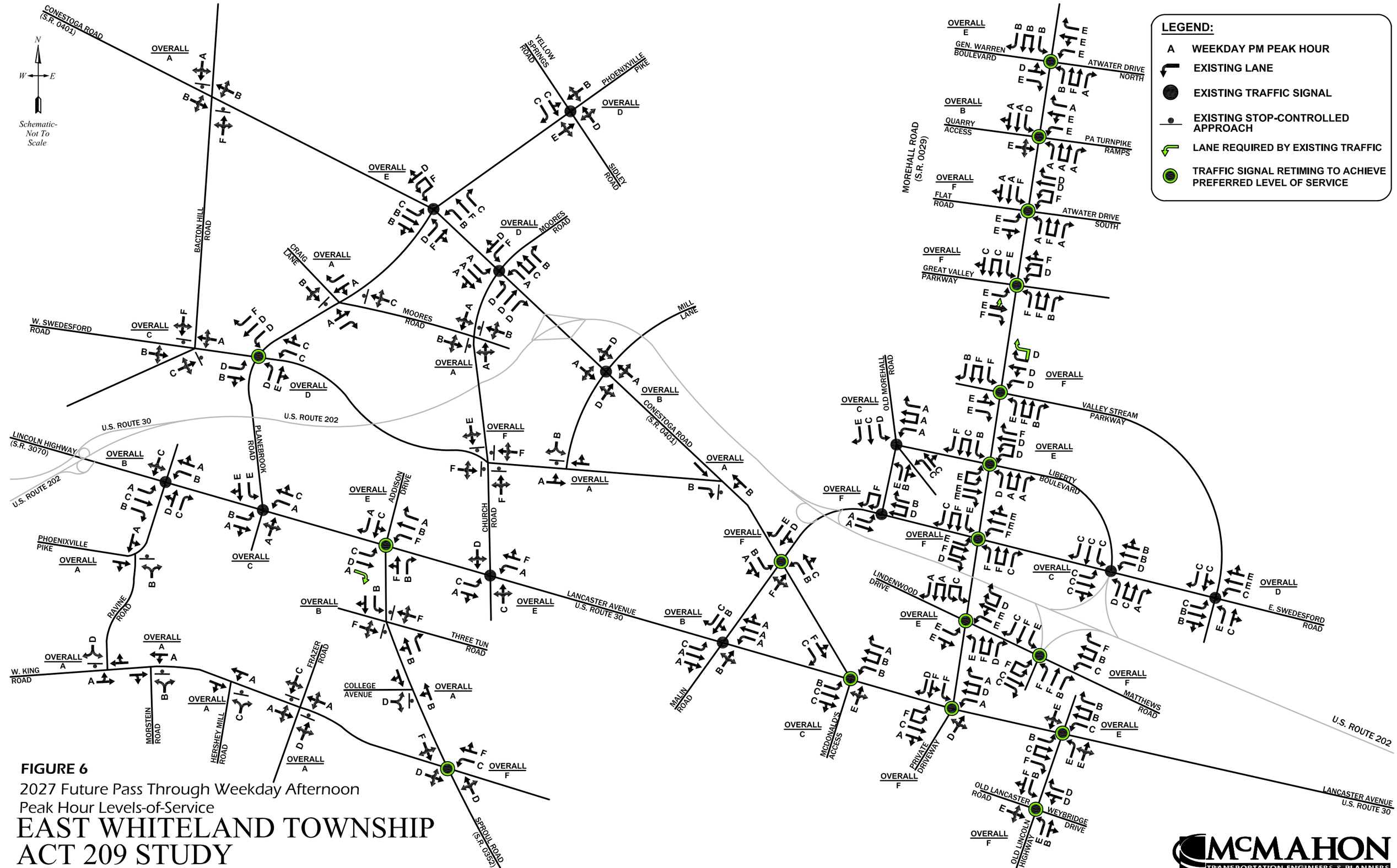

FIGURE 6

2027 Future Pass Through Weekday Afternoon Peak Hour Levels-of-Service

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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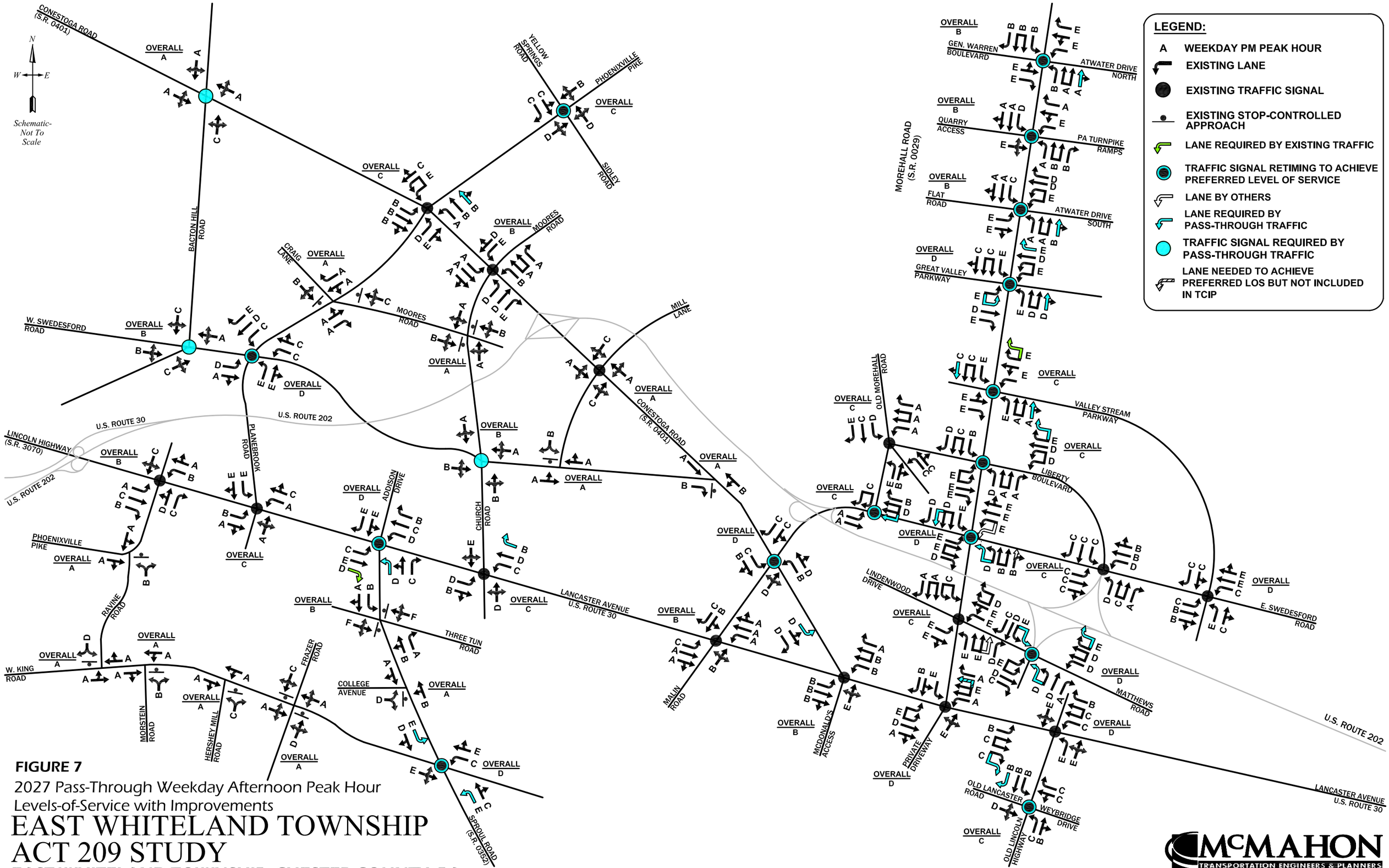

FIGURE 7

2027 Pass-Through Weekday Afternoon Peak Hour
Levels-of-Service with Improvements

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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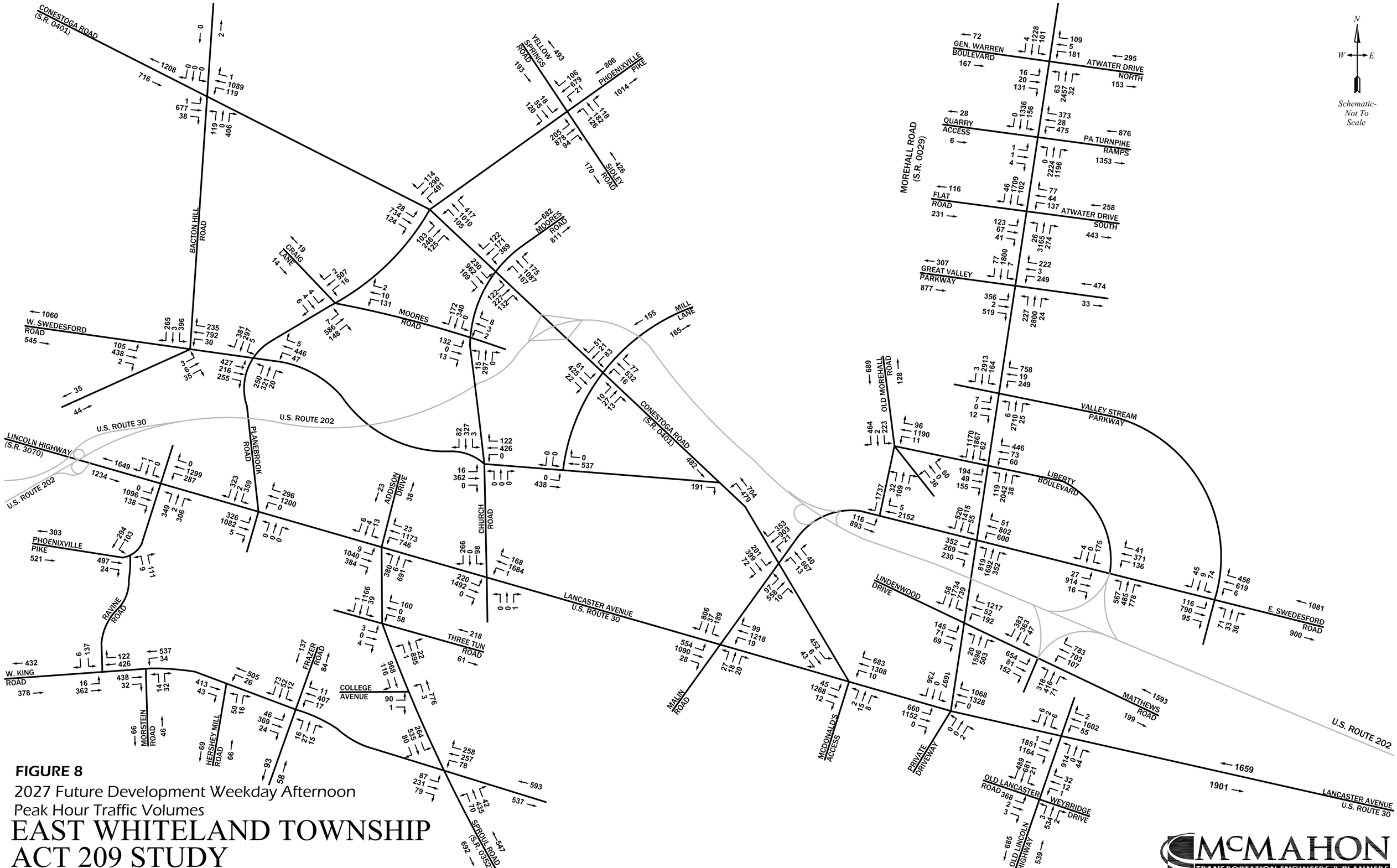

FIGURE 8

2027 Future Development Weekday Afternoon Peak Hour Traffic Volumes

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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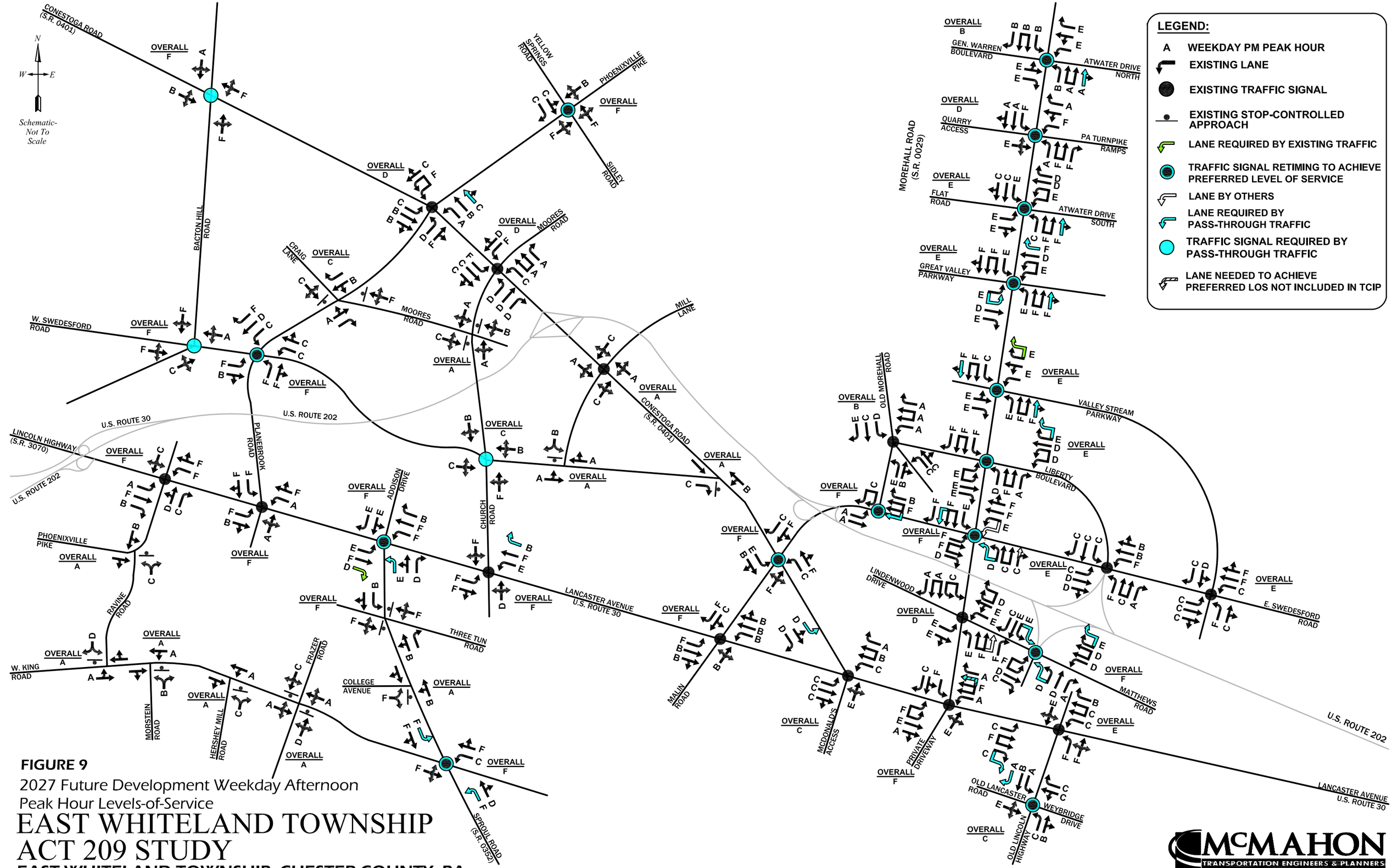

FIGURE 9

2027 Future Development Weekday Afternoon Peak Hour Levels-of-Service

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

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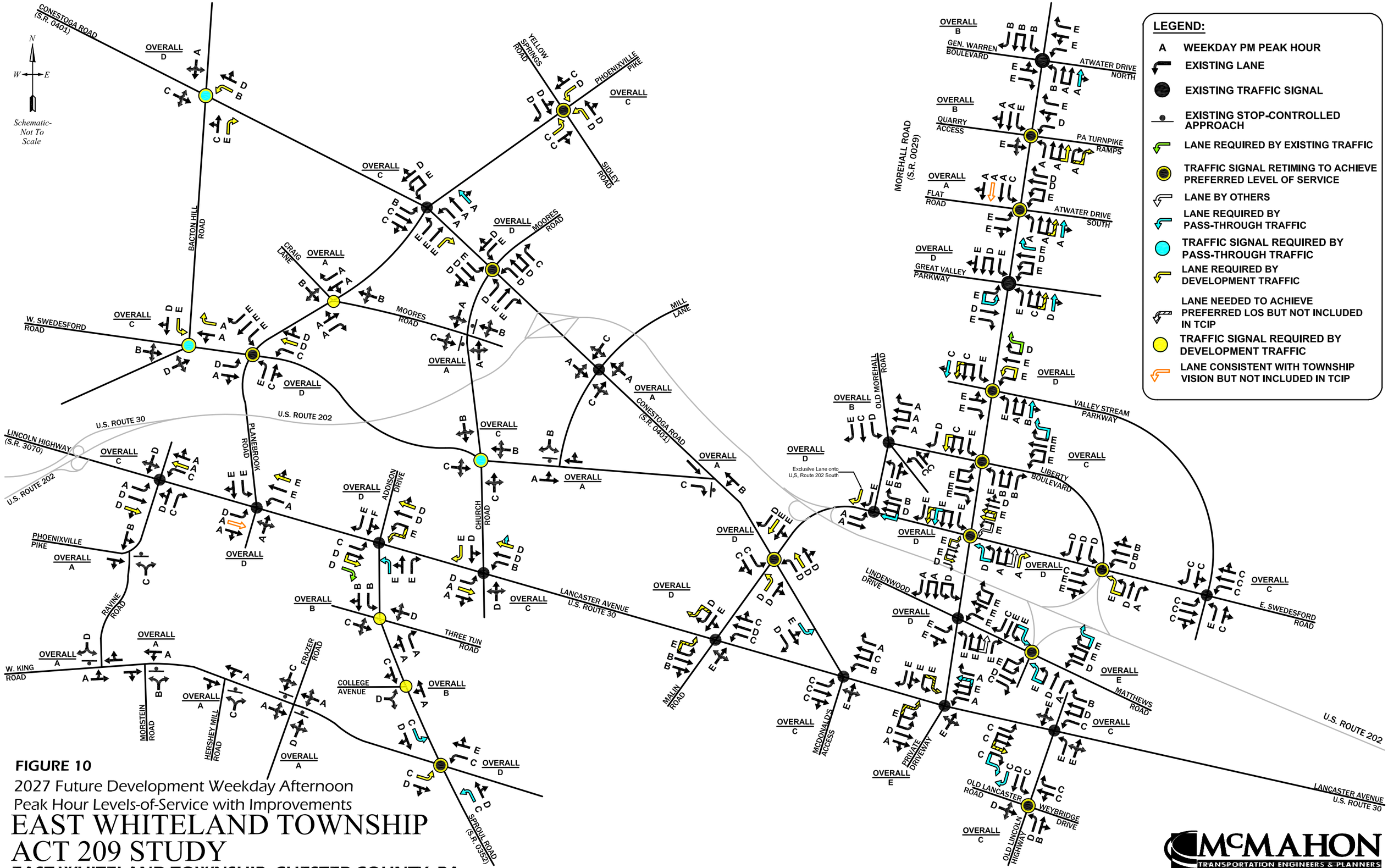

FIGURE 10

2027 Future Development Weekday Afternoon Peak Hour Levels-of-Service with Improvements

EAST WHITELAND TOWNSHIP ACT 209 STUDY

EAST WHITELAND TOWNSHIP, CHESTER COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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