PENNSYLVANIA ACT 209
TRANSPORTATION IMPACT FEE STUDY

WHITEMARSH TOWNSHIP

ROADWAY SUFFICIENCY ANALYSIS

and

TRANSPORTATION

CAPITAL IMPROVEMENTS PLAN

Prepared for:
Whitemarsh Township,
Montgomery County

December 2005

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INTRODUCTION

Overview

This *Roadway Sufficiency Analysis and Transportation Capital Improvements Plan* has been prepared in accordance with the requirements set forth in Pennsylvania Act 209 on behalf of Whitemarsh Township, Montgomery 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.

Impact fees under Act 209, with only one exception, contained in Act 68 amendments to the Municipalities Planning Code (2000), 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. 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.

Without the adoption of this Ordinance permitted by the Act 209 Law, a municipality does not have the power to require, as a condition for approval of a land development or subdivision application, the construction, dedication, or payment of any offsite improvements or capital expenditures.

All appendices supporting the *Roadway Sufficiency Analysis and Transportation Capital Improvements Plan* referred to in this report are contained in a separate bound document entitled *Pennsylvania Act 209 Transportation Impact Fee Study Technical Appendices*, Whitemarsh Township, Montgomery County, dated December 2005.

Process

The process that Whitemarsh 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 and designation of the geographic area(s) of the municipality that will be subject to the transportation impact fee ordinance.

2. Development and adoption of a land use assumptions report for the Township and its designated geographic areas, called Transportation Service Area(s) (TSA's), which together with existing development are the subject of a roadway sufficiency analysis and development of a transportation capital improvements plan.

3. Completion and approval of a roadway sufficiency analysis for the Transportation Service Areas, identifying traffic deficiencies and needed improvements attributable to existing traffic, future traffic not originating from the service areas (i.e., pass-through traffic), and future traffic originating from new development within the service areas 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 improvements 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 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 Areas, to be assessed on a "per trip" basis.

Act 209 requires a minimum future planning horizon of five years. In order to be consistent with the future horizon year of the Land Use Assumptions Report, the future year 2010 was selected as the design year of this study. However, this document should not be considered a static, "one-time" effort, as the Act 209 legislation has provisions for periodic updates of the roadway sufficiency analysis, capital improvements plan, and impact fees, as changes in the land use assumptions, transportation improvement needs, or funding conditions occur.

As the law allows for the periodic update of the Impact Fee charges, it is recommended that the Transportation Advisory Committee continue to meet periodically and make recommendations to the Board of Supervisors, as necessary, to update the Capital Improvements Plan (CIP) or impact fee charges based on the following:

1. New subsequent development that has occurred in the Township.
2. Capital improvements, listed in the CIP, which have been constructed.
3. Unavoidable delays in construction of the improvements listed in the CIP that are outside the control or responsibility of the Township.
4. Significant changes in the land use assumptions.
5. Significant changes in the estimated costs of the improvements listed in the CIP.
6. Significant changes in the projected revenue from all sources listed, needed for the construction of the improvements listed in the CIP.

Land Use Assumptions Report

As required by Act 209, the Whitemarsh Township Transportation Advisory Committee approved the Whitemarsh Township *Land Use Assumptions Report* (dated June 21, 2005), which was prepared and completed by Schoor Depalma Engineers and Consultants, at a public hearing on September 20, 2005. Subsequently, the Board of Supervisors adopted the *Land Use Assumptions Report* by resolution, as required by Act 209, on September 22, 2005. A copy of the *Land Use Assumptions Report,* and the resolution drafted by the Township to accept it, are provided in **Appendix A**.

The *Land Use Assumptions Report* identifies the anticipated long-term development build-out potential within Whitemarsh Township, as well as the projected short-term 2010 build-out on an area-by-area basis, and provides graphics illustrating the potential locations of these parcels. The projected short-term 2010 build-out within each Transportation Service Area, which is the basis of this analysis, is summarized below in **Table 1**.

Table 1. Land Use Assumptions Report 2010 Build-Out Summary

Land Use Classification	Service Area North	Service Area South
Residential	533 dwelling units	77 dwelling units
Non-Residential	62,295 s.f.	1,070,291 s.f

Based on the land use assumptions report, no significant additional development is expected to occur outside these transportation service areas through 2010.

EXISTING TRANSPORTATION NETWORK

This *Existing Transportation Network* 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 Areas required by the Act 209 legislation.

Roadway Characteristics

The Whitemarsh Township roadway system, as illustrated in **Figure 1**, consists primarily of two-lane, undivided roadways. Figure 1 also summarizes the existing average daily traffic (ADT) volumes on several roadways as they enter/exit adjacent Townships. Major regional access to the Township is provided via Skippack Pike (S.R. 0073), Bethlehem Pike (S.R. 2018), Germantown Pike (S.R. 3053), Ridge Pike, Butler Pike, Joshua Road (S.R. 3014), and Stenton Avenue (S.R. 3003). 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 in **Table 2**.

Table 2. Existing Transportation Network Summary

Roadway	Roadway Classification	Roadway Ownership	Posted Speed Limit (mph)
Bethlehem Pike (S.R. 2018)	Principal Arterial	State (S.R. 2018)	40
Butler Pike	Principal Arterial	County	25 to 35
Church Road (S.R. 0073)	Principal Arterial	State (S.R. 0073)	35
Germantown Pike (S.R. 3053)	Principal Arterial	State (S.R. 3053)	35
Ridge Pike	Principal Arterial	County	35
Skippack Pike (S.R. 0073)	Principal Arterial	State (S.R. 0073)	40 to 50
East Valley Green Road	Major Collector	Township	35
Barren Hill Road (S.R. 3011)	Major Collector	State (S.R. 3011)	35
Flourtown Road (S.R. 3007)	Major Collector	State (S.R. 3007)	40
Harts Lane	Major Collector	Township	25
Hector Street (S.R. 3059)	Major Collector	State (S.R. 3059)	35
Joshua Road (S.R. 3014)	Major Collector	State (S.R. 3014)	35 to 45
Lafayette Avenue (S.R. 3014)	Major Collector	State (S.R. 3014)	35
Morris Road (S.R. 2001)	Major Collector	State (S.R. 2001)	40
Stenton Avenue (S.R. 3003)	Major Collector	State (S.R. 3003)	40
Camp Hill Road (S.R. 2028)	Minor Collector	State (S.R. 2028)	40
Cedar Grove Road (S.R. 3011)	Minor Collector	State (S.R. 3011)	35
Church Road	Minor Collector	Township	25
Crescent Avenue	Minor Collector	Township	25
Manor Road	Minor Collector	Township	30
Militia Hill Road (S.R. 3005)	Minor Collector	State Road (S.R. 3005)	40
North Lane (S.R. 3015)	Minor Collector	State Road (S.R. 3015)	35
River Road	Minor Collector	Township	30
Sheaff Lane	Minor Collector	Township	35
Spring Mill Road	Minor Collector	Township	25
Thomas Road	Minor Collector	Township	35

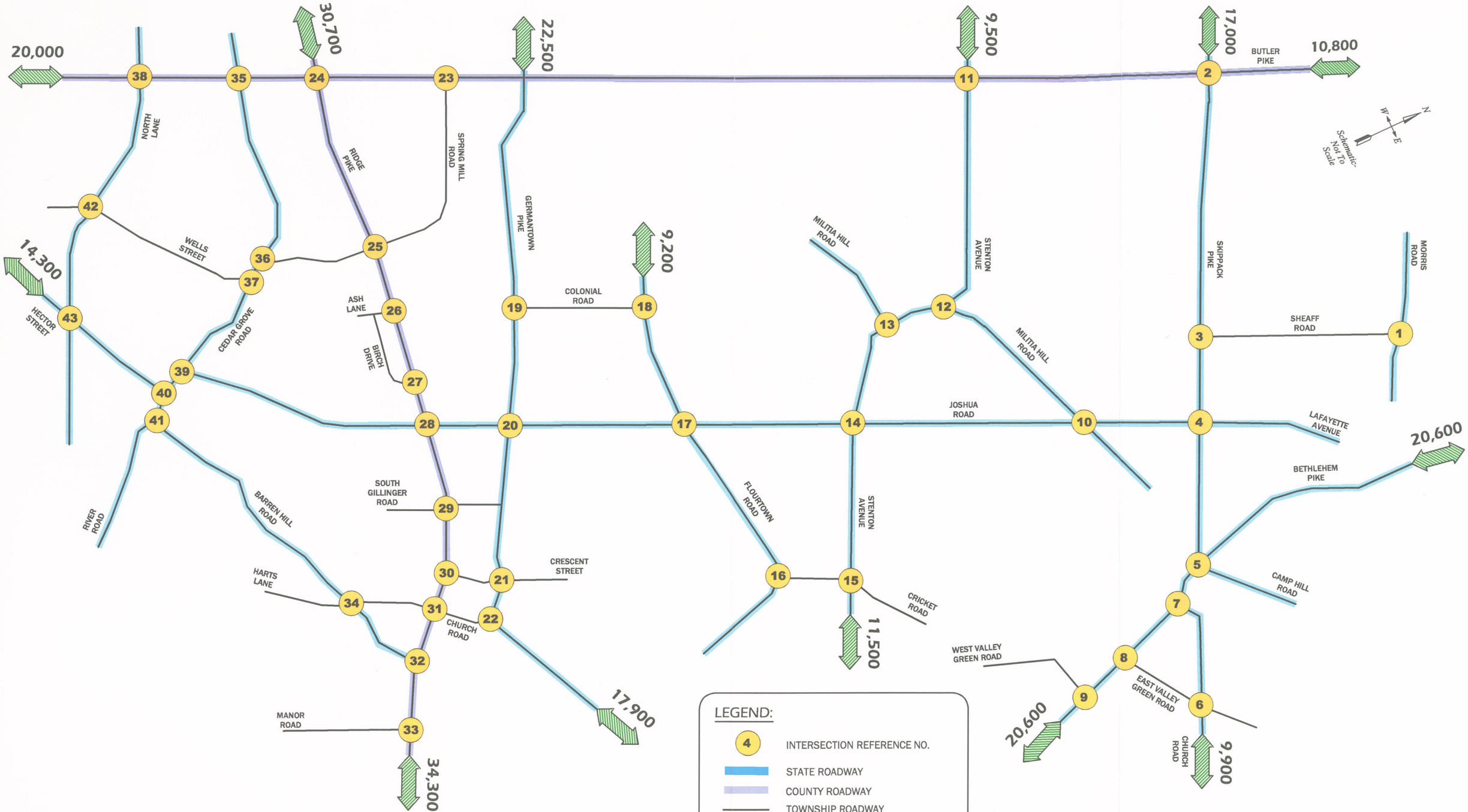

FIGURE 1

Study Area and 2005 Average Daily Traffic Volumes

WHITEMARSH TOWNSHIP ACT 209 STUDY

WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PA

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Table 2. Existing Transportation Network Summary (cont'd.)

Roadway	Roadway Classification	Roadway Ownership	Posted Speed Limit (mph)
West Valley Green Road	Minor Collector	Township	25
South Gillinger Road	Minor Collector	Township	25
Wells Street	Minor Collector	Township	25

Several other Township roadways also comprise the transportation roadway network of the Township; however, these roadways are generally classified as local roadways that provide access for Township development to the major arterial and collector roadways, but have limited regional accessibility through the Township. The following roadway segments were specifically designated for evaluation as part of this Act 209 Study:

- Butler Pike, Skippack Pike (S.R. 0073) to Stenton Avenue (S.R. 3003)
- Butler Pike, Stenton Avenue (S.R. 3003) to Germantown Pike (S.R. 3053)
- Butler Pike, Spring Mill Road to Ridge Pike
- Ridge Pike, Butler Pike to Spring Mill Road
- Ridge Pike, Spring Mill Road to Joshua Road (S.R. 3014)
- Ridge Pike, Manor Road to Springfield Township line
- Bethlehem Pike (S.R. 2018), Upper Dublin Township line to Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)
- Bethlehem Pike (S.R. 2018), West Valley Green Road to Springfield Township line
- Skippack Pike (S.R. 0073), Butler Pike to Sheaff Road
- Joshua Road (S.R. 3014), Stenton Avenue (S.R. 3003) to Militia Hill Road (S.R. 3005)
- Hector Street (S.R. 3059), Cedar Grove Road (S.R. 3011) to North Lane (S.R. 3015)

In addition to the study roadway segments, 43 study intersections have been selected by the Township to be evaluated and included in the *Roadway Sufficiency Analysis* and *Capital Improvements Plan*, and include the following, as indicated in both **Table 3** and Figure 1.

Table 3. Study Intersections

Intersection Reference No.	Intersection	Current Traffic Control
1	Morris Road (S.R. 2001) and Sheaff Lane	Stop Sign
2	Skippack Pike (S.R. 0073) and Butler Pike	Traffic Signal
3	Skippack Pike (S.R. 0073) and Sheaff Lane	Stop Sign
4	Skippack Pike (S.R. 0073) and Joshua Road (S.R. 3014)/ Lafayette Avenue (S.R. 3014)	Traffic Signal
5	Skippack Pike (S.R. 0073) and Bethlehem Pike (S.R. 2018)/ Camp Hill Road (S.R. 2028)	Traffic Signal
6	Church Road (S.R. 0073) and East Valley Green Road	Traffic Signal
7	Bethlehem Pike (S.R. 2018) and Church Road (S.R. 0073)	Traffic Signal
8	Bethlehem Pike (S.R. 2018) and East Valley Green Road	Traffic Signal
9	Bethlehem Pike (S.R. 2018) and West Valley Green Road	Traffic Signal

Table 3. Study Intersections (cont'd.)

Intersection Reference No.	Intersection	Current Traffic Control
10	Joshua Road (S.R. 3014) and Militia Hill Road (S.R. 3005)	Stop Sign
11	Butler Pike and Stenton Avenue (S.R. 3003)	Traffic Signal
12	Stenton Avenue (S.R. 3003) and West Militia Hill Road (S.R. 3005)	Stop Sign
13	Stenton Avenue (S.R. 3003) and East Militia Hill Road (S.R. 3005)	Stop Sign
14	Joshua Road (S.R. 3014) and Stenton Avenue (S.R. 3003)	Traffic Signal
15	Cricket Road and Stenton Avenue (S.R. 3003)	Traffic Signal
16	Thomas Road and Flourtown Road (S.R. 3007)	Stop Sign
17	Joshua Road (S.R. 3014) and Flourtown Road (S.R. 3007)	Traffic Signal
18	Colonial Road and Flourtown Road (S.R. 3007)	Stop Sign
19	Germantown Pike (S.R. 3053) and Colonial Road	Stop Sign
20	Germantown Pike (S.R. 3053) and Joshua Road (S.R. 3014)	Traffic Signal
21	Germantown Pike (S.R. 3053) and Crescent Street	Traffic Signal
22	Germantown Pike (S.R. 3053) and Church Road	Stop Sign
23	Butler Pike and Spring Mill Road	Stop Sign
24	Butler Pike and Ridge Pike	Traffic Signal
25	Ridge Pike and Spring Mill Road	Traffic Signal
26	Ridge Pike and Ash Lane	Stop Sign
27	Ridge Pike and Birch Road	Stop Sign
28	Ridge Pike and Joshua Road (S.R. 3014)	Traffic Signal
29	Ridge Pike and South Gillinger Road	Traffic Signal
30	Ridge Pike and Crescent Street	Stop Sign
31	Ridge Pike and Church Road	Traffic Signal
32	Ridge Pike and Barren Hill Road (S.R. 3011)	Stop Sign
33	Ridge Pike and Manor Road	Traffic Signal
34	Barren Hill Road (S.R. 3011) and Harts Lane	Stop Sign
35	Butler Pike and Cedar Grove Road (S.R. 3011)	Traffic Signal
36	Cedar Grove Road (S.R. 3011) and Spring Mill Road	Stop Sign
37	Cedar Grove Road (S.R. 3011) and Wells Street	Stop Sign
38	Butler Pike and North Lane (S.R. 3015)	Traffic Signal
39	Joshua Road (S.R. 3014) and Cedar Grove Road (S.R. 3011)	Stop Sign
40	Cedar Grove Road (S.R.3011) and Hector Street	Traffic Signal
41	Barren Hill Road (S.R. 3011) and River Road	Stop Sign
42	North Lane (S.R. 3015) and Wells Street	Stop Sign
43	Hector Street (S.R. 3059) and North Lane (S.R. 3015)	Traffic Signal

Existing Traffic Volumes

Traffic operating conditions are influenced by the relationships between traffic volumes and the service capacities of the roadways and intersections. In order to evaluate existing conditions at area intersections, Manual Turning Movement (MTM) counts were conducted at each of the 43 study intersections during the weekday afternoon peak period (4:00 PM to 6:00 PM) on typical weekdays in April, May, and June 2005. The traffic counts commenced on April 27, 2005, and this traffic count/volume data should be considered the baseline by the Township for determining new development or redevelopment's effect on the study roadway network, based upon the vacancy/occupancy levels of each property at the time of the study. 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, and serve as the basis for this analysis. **Figure 2** illustrates the 2005 existing weekday afternoon peak hour traffic volumes at the study area intersections. The actual MTM counts are provided in **Appendix B**.

Additionally, 24-hour Automatic Traffic Recorder (ATR) counts were conducted at fourteen locations over the course of a one-week period during May 2005 to determine the traffic volumes typically entering and exiting the Township along the major study roadways, as well as to establish current traffic patterns along the area roadways. The 2005 average daily traffic volumes are summarized in Figure 1, and the detailed ATR count data is provided in **Appendix C**. The ATR counts were conducted at the following locations:

- Butler Pike, south of North Lane (S.R. 3015)
- Butler Pike, north of Skippack Pike (S.R. 0073)
- Bethlehem Pike (S.R. 2018), north of Joshua Road (S.R. 3014)/Lafayette Avenue (S.R. 3014)
- Bethlehem Pike (S.R. 2018), south of Sunnybrook Avenue
- Skippack Pike (S.R. 0073), east of Butler Pike
- Stenton Avenue (S.R. 3003), east of Butler Pike
- Stenton Avenue (S.R. 3003), east of Mill Road
- Flourtown Road (S.R. 3007), east of Butler Pike
- Germantown Pike (S.R. 3053), east of Butler Pike
- Germantown Pike (S.R. 3053), west of Manor Road
- Ridge Pike, east of Butler Pike
- Ridge Pike, west of Manor Road
- Hector Street (S.R. 3059), west of North Lane (S.R. 3015)
- Church Road (S.R. 0073), west of Valley Green Road

Transportation Service Areas

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 contiguous, 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). Further explanation of pass-through and development traffic will be provided in subsequent sections.

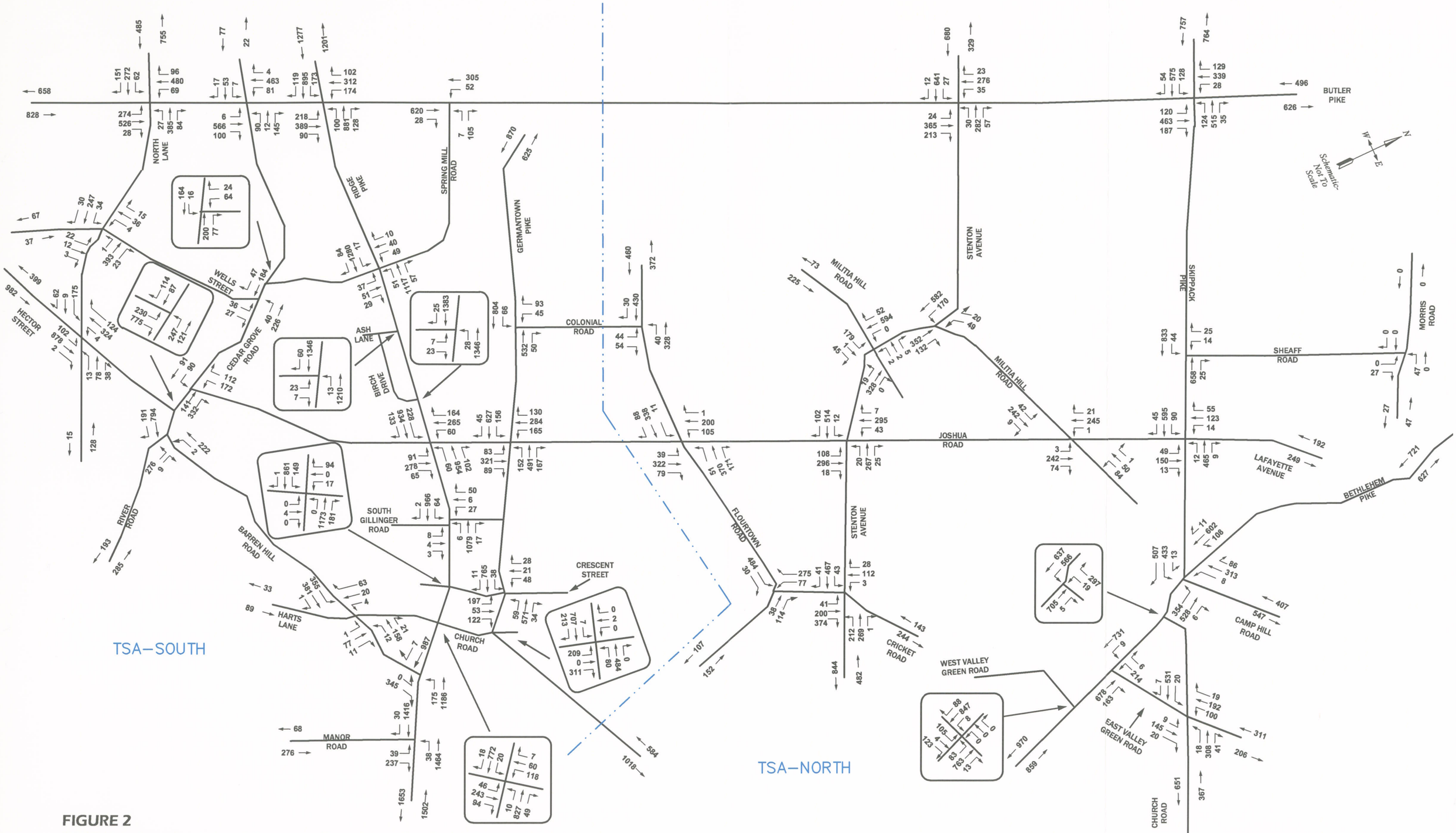

FIGURE 2

2005 Existing Weekday Afternoon Peak Hour Traffic Volumes

WHITEMARSH TOWNSHIP ACT 209 STUDY

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As shown in **Figure 3**, the Transportation Advisory Committee has established two transportation service areas within Whitemarsh Township in accordance with the requirements of Act 209. Each of the two transportation service areas measures less than the maximum seven square miles required by the Act 209 legislation.

Transportation Service Area North

As illustrated in Figure 3, Transportation Service Area North generally consists of the area of the Township north of Flourtown Road, excluding the Fort Washington State Park. The 18 intersections located within the approximate 6.96 square mile service area are defined in **Table 4.**

Table 4. Transportation Service Area North Study Intersections

Reference No.	Intersection	
1	Morris Road and Sheaff Lane	Stop Sign
2	Skippack Pike (S.R. 0073) and Butler Pike	Traffic Signal
3	Skippack Pike (S.R. 0073) and Sheaff Lane	Stop Sign
4	Skippack Pike (S.R. 0073) and Joshua Road (S.R. 3014)/ Lafayette Avenue (S.R. 3014)	Traffic Signal
5	Skippack Pike (S.R. 0073) and Bethlehem Pike (S.R. 2018)/ Camp Hill Road (S.R. 2028)	Traffic Signal
6	Church Road (S.R. 0073) and East Valley Green Road	Traffic Signal
7	Bethlehem Pike (S.R. 2018) and Church Road (S.R. 0073)	Traffic Signal
8	Bethlehem Pike (S.R. 2018) and East Valley Green Road	Traffic Signal
9	Bethlehem Pike (S.R. 2018) and West Valley Green Road	Traffic Signal
10	Joshua Road (S.R. 3014) and Militia Hill Road (S.R. 3005)	Stop Sign
11	Butler Pike and Stenton Avenue (S.R. 3003)	Traffic Signal
12	Stenton Avenue (S.R. 3003) and West Militia Hill Road (S.R. 3005)	Stop Sign
13	Stenton Avenue (S.R. 3003) and East Militia Hill Road (S.R. 3005)	Stop Sign
14	Joshua Road (S.R. 3014) and Stenton Avenue (S.R. 3003)	Traffic Signal
15	Cricket Road and Stenton Avenue (S.R. 3003)	Traffic Signal
16	Thomas Road and Flourtown Road (S.R. 3007)	Stop Sign
17	Joshua Road (S.R. 3014) and Flourtown Road (S.R. 3007)	Traffic Signal
18	Colonial Road and Flourtown Road (S.R. 3007)	Stop Sign

Transportation Service Area South

As illustrated in Figure 3, Transportation Service Area South generally consists of the area of the Township south of, and including, Joshua Road. The 25 intersections located within the approximate 6.99 square mile service area are defined in **Table 5.**

LEGEND:

- TRANSPORTATION SERVICE AREA BOUNDARY
- AREAS EXCLUDED IN TRANSPORTATION SERVICE AREA

TSA South = 6.99 sq. mi

TSA North = 6.96 sq. mi

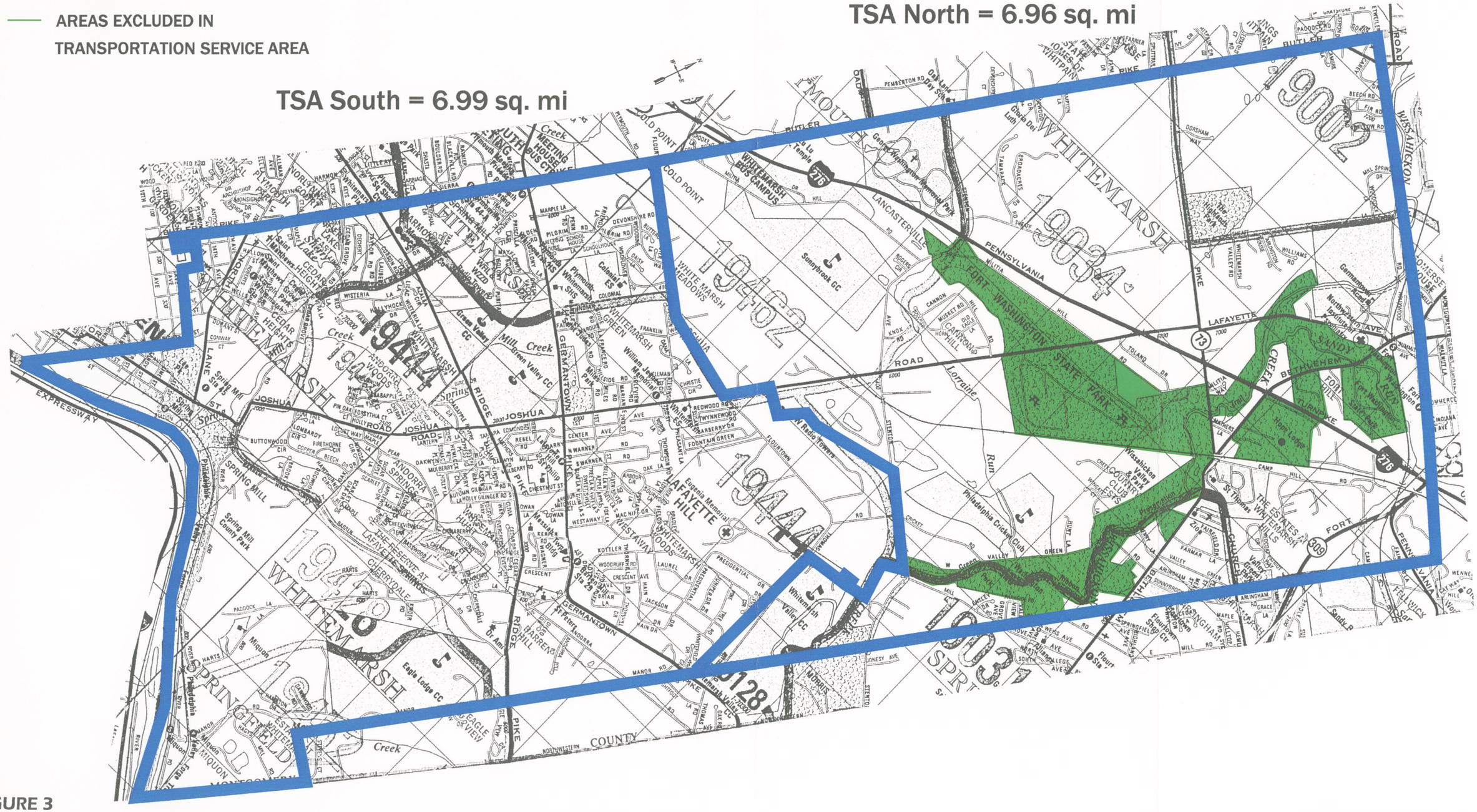

FIGURE 3

Transportation Service Areas

WHITEMARSH TOWNSHIP ACT 209 STUDY

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Table 5. Transportation Service Area South Study Intersections

Reference No.	Intersection	
19	Germantown Pike (S.R. 3053) and Colonial Road	Stop Sign
20	Germantown Pike (S.R. 3053) and Joshua Road (S.R. 3014)	Traffic Signal
21	Germantown Pike (S.R. 3053) and Crescent Street	Traffic Signal
22	Germantown Pike (S.R. 3053) and Church Road	Stop Sign
23	Butler Pike and Spring Mill Road	Stop Sign
24	Butler Pike and Ridge Pike	Traffic Signal
25	Ridge Pike and Spring Mill Road	Traffic Signal
26	Ridge Pike and Ash Lane	Stop Sign
27	Ridge Pike and Birch Road	Stop Sign
28	Ridge Pike and Joshua Road (S.R. 3014)	Traffic Signal
29	Ridge Pike and South Gillinger Road	Traffic Signal
30	Ridge Pike and Crescent Street	Stop Sign
31	Ridge Pike and Church Road	Traffic Signal
32	Ridge Pike and Barren Hill Road (S.R. 3011)	Stop Sign
33	Ridge Pike and Manor Road	Traffic Signal
34	Barren Hill Road (S.R. 3011) and Harts Lane	Stop Sign
35	Butler Pike (S.R. 3016) and Cedar Grove Road (S.R. 3011)	Traffic Signal
36	Cedar Grove Road (S.R. 3011) and Spring Mill Road	Stop Sign
37	Cedar Grove Road (S.R. 3011) and Wells Street	Stop Sign
38	Butler Pike and North Lane (S.R. 3015)	Traffic Signal
39	Joshua Road (S.R. 3014) and Cedar Grove Road (S.R. 3011)	Stop Sign
40	Cedar Grove Road (S.R.3011) and Hector Street	Traffic Signal
41	Barren Hill Road (S.R. 3011) and River Road	Stop Sign
42	North Lane (S.R. 3015) and Wells Street	Stop Sign
43	Hector Street (S.R. 3059) and North Lane (S.R. 3015)	Traffic Signal

EXISTING TRANSPORTATION CONDITIONS

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

Analysis Methodology

The traffic volumes in Figure 2 were subjected to detailed capacity/level-of-service analysis in accordance with the standard techniques contained in the ***Highway Capacity Manual***[1]. 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 and two-lane roadway segments and arterials, as well as the correlation between average total control delay and the respective levels of service for each intersection and roadway type. Level of service (LOS) is the criterion utilized to evaluate the study intersections and roadways in accordance with standard traffic engineering practice and the Act 209 legislation.

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 and roadways studied. The preferred level of service is considered the operational design standard by which each study intersection and roadway segment must operate under existing conditions, future pass-through conditions, and future development conditions in this *Roadway Sufficiency Analysis*. Deficient (worsened) operations that do not satisfy the preferred level(s) of service at the study intersections and roadway segments must be improved for each condition.

According to Act 209, the preferred level of service may be waived by the municipality at individual intersections or roadway segments based upon difficulty in implementing various improvements (i.e., geometric design limitations, topographic limitations, or unavailable/unobtainable necessary right-of-way). Similarly, 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 such time traffic volumes warrant signalization. As shown in **Table 6**, the Transportation Advisory Committee has adopted specific preferred level-of-service criteria for the purposes of this *Roadway Sufficiency Analysis*.

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(1) *Transportation Research Board, Special Report 209, Highway Capacity Manual, published by the Transportation Research Board, Washington, DC, 2000.*

Table 6. Preferred Level-of-Service Criteria

Intersection/Roadway Type	
Signalized	**LOS E** all movements **LOS E** overall
Unsignalized	**LOS E** critical movements
Roadway Segments	**LOS E** overall

For signalized intersections, the preferred levels of service indicated above apply to individual movements, as well as to overall intersection operations. Conversely, for unsignalized intersections, the preferred levels of service apply only to the critical turning or cross-street through movements at the intersections. For roadway segments, the preferred level of service applies to each direction of travel.

These preferred levels of service were established based on a review of typical acceptability thresholds utilized by PennDOT and other adjacent municipalities, in the suburban/urban context of Whitemarsh Township.

Existing Levels of Service

The year 2005 existing weekday afternoon peak hour traffic volumes presented in Figure 2 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 43 study intersections, 26 presently operate at or above the preferred levels of service during the weekday afternoon peak hour. The following 17 intersections currently do not satisfy the preferred level-of-service criteria.

Service Area North

- Skippack Pike (S.R. 0073) and Butler Pike
- Bethlehem Pike (S.R. 2018) and Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)
- Stenton Avenue (S.R. 3003) and Militia Hill Road – west (S.R. 3005)
- Stenton Avenue (S.R. 3003) and Militia Hill Road – east (S.R. 3005)
- Stenton Avenue (S.R. 3003) and Cricket Road

Service Area South

- Germantown Pike (S.R. 3053) and Colonial Road
- Germantown Pike (S.R. 3053) and Joshua Road (S.R. 3014)
- Germantown Pike (S.R. 3053) and Church Road
- Ridge Pike and Butler Pike
- Ridge Pike and Ash Lane
- Ridge Pike and Birch Drive
- Ridge Pike and Joshua Road (S.R. 3014)

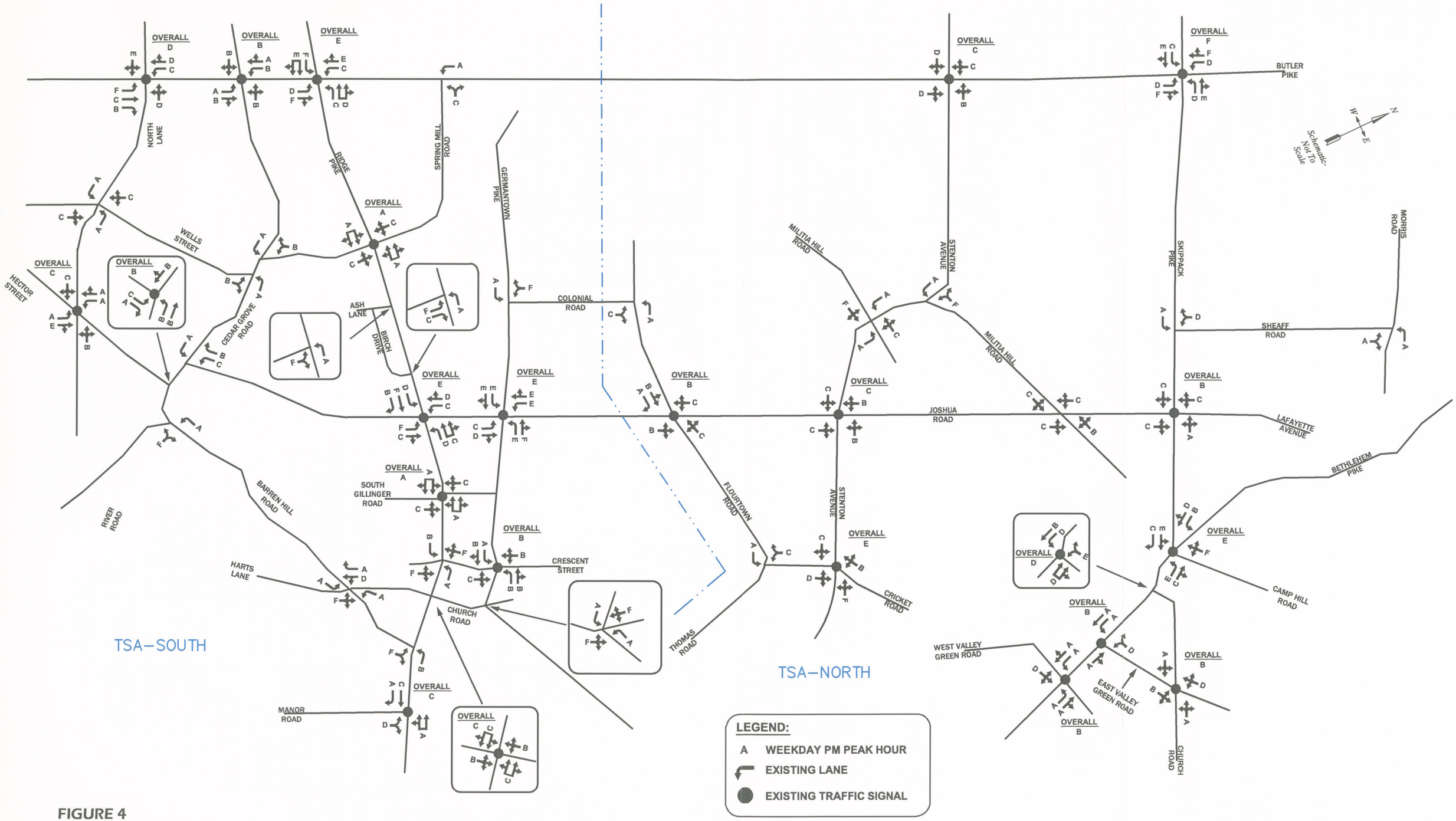

FIGURE 4

2005 Existing Levels of Service

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- Ridge Pike and Crescent Street
- Ridge Pike and Barren Hill Road (S.R. 3011)
- Barren Hill Road (S.R. 3011) and Harts Lane
- Barren Hill Road (S.R. 3011) and River Road
- North Lane (S.R. 3015) and Butler Pike

The roadway segment level-of-service analysis indicates that each of the studied roadway segments satisfies the preferred level-of-service criteria, as summarized in **Table 7**.

Table 7. Existing Roadway Segment Levels of Service

Roadway	Segment	LOS
Service Area North		
Butler Pike	Skippack Pike (S.R. 0073) to Stenton Avenue (S.R. 3003)	E
	Stenton Avenue (S.R. 3003) to Germantown Pike (S.R. 3053)	E
Bethlehem Pike (S.R. 2018)	Upper Dublin Township line to Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)	E
	West Valley Green Road to Springfield Township line	E
Skippack Pike (S.R. 0073)	Butler Pike to Sheaff Road	E
Joshua Road (S.R. 3014)	Stenton Avenue (S.R. 3003) to Militia Hill Road (S.R. 3005)	E
Service Area South		
Butler Pike	Spring Mill Road to Ridge Pike	E
Ridge Pike	Butler Pike to Spring Mill Road	B EB/B WB[1]
	Spring Mill Road to Joshua Road (S.R. 3014)	B EB/B WB[1]
	Manor Road to Springfield Township line	C EB/B WB[1]
Hector Street (S.R. 3059)	Cedar Grove Road to North Lane (S.R. 3015)	E

[1] EB = Eastbound, WB = Westbound

Existing Improvement Program

The improvements necessary to mitigate existing traffic deficiencies and satisfy the preferred level-of-service criteria are illustrated in **Figure 5** and summarized in **Tables 8 and 9**, respectively, for each study intersection and roadway. Improvements will be required at eleven study intersections in order to achieve the preferred levels of service under existing traffic conditions. The six additional unsignalized

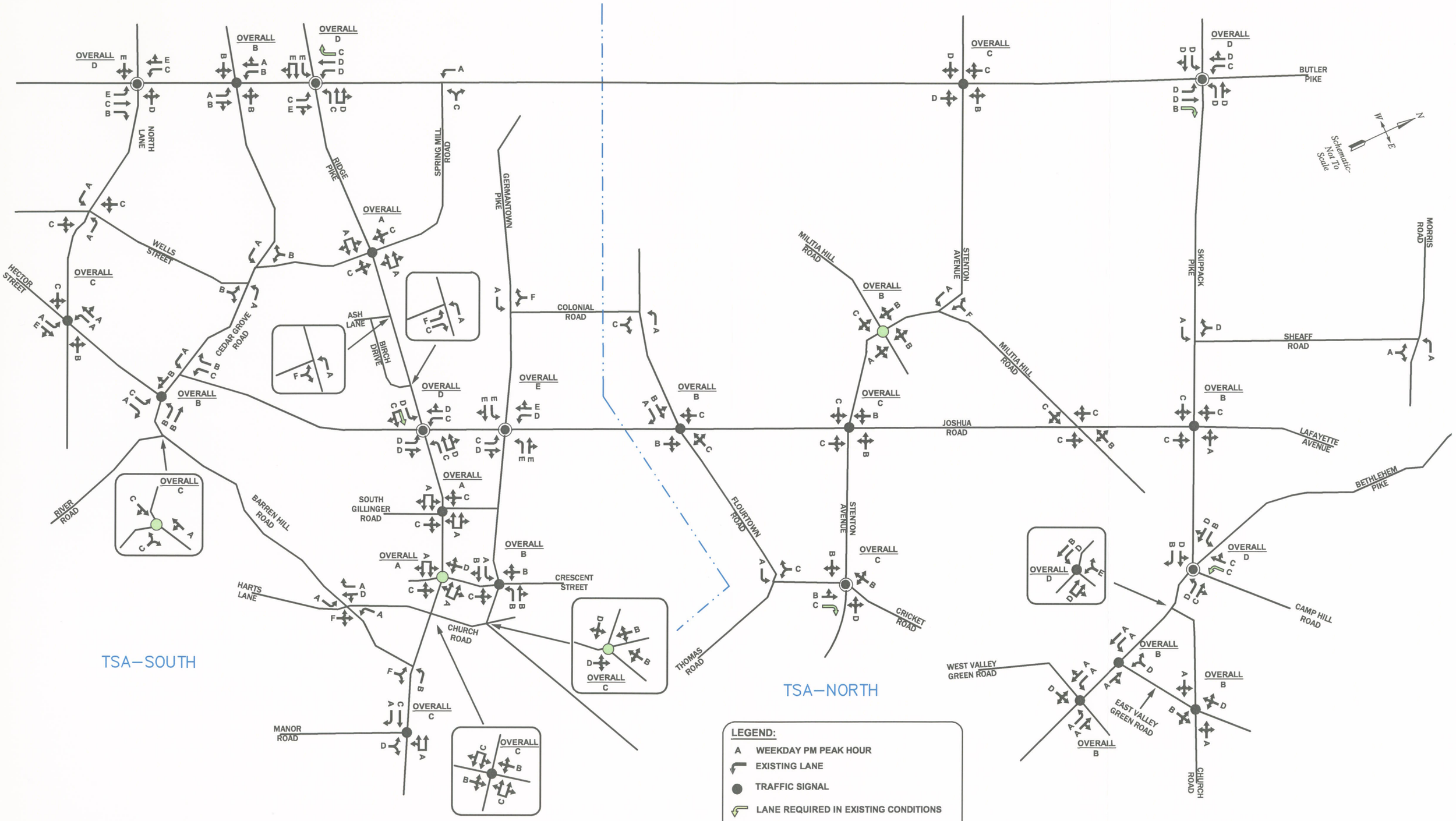

FIGURE 5

2005 Existing Levels of Service with Improvements

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intersections do not satisfy the preferred level-of-service criteria. However, existing afternoon peak hour traffic volumes do not meet warrants for traffic signal installation in accordance with PennDOT guidelines; therefore, the improvements at these intersections must be deferred.

It is noted that the recommended transportation improvements contained herein do not preclude the necessity or desirability of improvements at other non-study intersections/roadways within the Township, identified intersections/roadways contained in the *Whitemarsh Township Comprehensive Plan*, or any other intersection/roadways where operational deficiencies or the need for traffic-calming measures may be identified in the future.

Table 8. Existing Conditions Improvement Program for Study Intersections

Int No.	Intersection	Traffic Control	Recommended Improvements
	Service Area North		
1	Morris Road and Sheaff Lane	Stop Sign	No improvements required or recommended.
2	Skippack Pike and Butler Pike	Traffic Signal	**Widen Butler Pike to install NB right-turn lane, and traffic signal modifications.**
3	Skippack Pike and Sheaff Lane	Stop Sign	No improvements required or recommended.
4	Skippack Pike and Joshua Road/Lafayette Avenue	Traffic Signal	No improvements required or recommended.
5	Skippack Pike and Bethlehem Pike/Camp Hill Road	Traffic Signal	**Widen Camp Hill Road to install WB left-turn lane, and traffic signal modifications.**
6	Church Road and East Valley Green Road	Traffic Signal	No improvements required or recommended.
7	Bethlehem Pike and Church Road	Traffic Signal	No improvements required or recommended.
8	Bethlehem Pike and East Valley Green Road	Traffic Signal	No improvements required or recommended.
9	Bethlehem Pike and West Valley Green Road	Traffic Signal	No improvements required or recommended.
10	Joshua Road and Militia Hill Road	Stop Sign	No improvements required or recommended.
11	Butler Pike and Stenton Avenue	Traffic Signal	No improvements required or recommended.
12	Stenton Avenue and West Militia Hill Road	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
13	Stenton Avenue and East Militia Hill Road	Stop Sign	**Install Traffic Signal.**
14	Joshua Road and Stenton Avenue	Traffic Signal	No improvements required or recommended.
15	Stenton Avenue and Cricket Road	Traffic Signal	**Widen Cricket Road to install NB right-turn lane, and traffic signal modifications.**
16	Thomas Road and Flourtown Road	Stop Sign	No improvements required or recommended.
17	Joshua Road and Flourtown Road	Traffic Signal	No improvements required or recommended.
18	Colonial Road and Flourtown Road	Stop Sign	No improvements required or recommended.

Table 8. Existing Conditions Improvement Program for Study Intersections

Int No.	Intersection	Traffic Control	Recommended Improvements
	Service Area South		
19	Germantown Pike and Colonial Road	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
20	Germantown Pike and Joshua Road	Traffic Signal	**Traffic Signal Modifications.**
21	Germantown Pike and Crescent Street	Traffic Signal	No improvements required or recommended.
22	Germantown Pike and Church Road	Stop Sign	**Install Traffic Signal.**
23	Butler Pike and Spring Mill Road	Stop Sign	No improvements required or recommended.
24	Ridge Pike and Butler Pike	Traffic Signal	**Widen Butler Pike to install SB right-turn lane, and traffic signal modifications.**
25	Ridge Pike and Spring Mill Road	Traffic Signal	No improvements required or recommended.
26	Ridge Pike and Ash Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
27	Ridge Pike and Birch Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
28	Ridge Pike and Joshua Road	Traffic Signal	**Widen Ridge Pike to install additional EB through lane, and traffic signal modifications.**
29	Ridge Pike and South Gillinger Road	Traffic Signal	No improvements required or recommended.
30	Ridge Pike and Crescent Street	Stop Sign	**Install Traffic Signal.**
31	Ridge Pike and Church Road	Traffic Signal	No improvements required or recommended.
32	Ridge Pike and Barren Hill Road	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
33	Ridge Pike and Manor Road	Traffic Signal	No improvements required or recommended.
34	Barren Hill Road and Harts Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
35	Butler Pike and Cedar Grove Road	Traffic Signal	No improvements required or recommended.
36	Cedar Grove Road and Spring Mill Road	Stop Sign	No improvements required or recommended.
37	Cedar Grove Road and Wells Street	Stop Sign	No improvements required or recommended.
38	Butler Pike and North Lane	Traffic Signal	**Traffic Signal Modifications.**
39	Joshua Road and Cedar Grove Road	Stop Sign	No improvements required or recommended.
40	Cedar Grove Road and Hector Street	Traffic Signal	No improvements required or recommended.
41	Barren Hill Road and River Road	Stop Sign	**Install Traffic Signal.**
42	North Lane and Wells Street	Stop Sign	No improvements required or recommended.

Table 9. Existing Conditions Improvement Program for Study Roadways

Roadway	Segment	Recommended Improvement
Service Area North		
Butler Pike	Skippack Pike to Stenton Avenue	No improvements required or recommended.
	Stenton Avenue to Germantown Pike	No improvements required or recommended.
Bethlehem Pike	Upper Dublin Township to Skippack Pike/Camp Hill Road	No improvements required or recommended.
	West Valley Green Road to Springfield Township	No improvements required or recommended.
Skippack Pike	Butler Pike to Sheaff Road	No improvements required or recommended.
Joshua Road	Stenton Avenue to Militia Hill Road	No improvements required or recommended.
Service Area South		
Butler Pike	Spring Mill Road to Ridge Pike	No improvements required or recommended.
Ridge Pike	Butler Pike to Spring Mill Road	No improvements required or recommended.
	Spring Mill Road to Joshua Road	No improvements required or recommended.
	Manor Road to Springfield Township line	No improvements required or recommended.
Hector Street	Cedar Grove Road to North Lane	No improvements required or recommended.

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 five-year time frame was selected by consensus of the Transportation Advisory Committee for the Whitemarsh Township Act 209 traffic analysis, which is consistent with the short-term development projections contained in the *Land Use Assumptions Report*, and produces a forecast year of 2010.

Future Traffic Components

Traffic volume forecasts for 2010 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, and is subdivided into the following two elements:

- This first element reflects future increases in regional traffic which is both generated by, and destined to, locations external to the designated transportation service areas, but passes through the designated service areas along the study area roadways. This first element of pass-through traffic also includes traffic generated by specific known future developments located within the adjacent municipalities.
- The second element of pass-through traffic includes future development traffic generated from one designated transportation service area within the Township that passes through the other designated transportation service area within the Township. For example, while traffic generated from TSA-North is considered "development" traffic in TSA-North, this same traffic is considered "pass-through" traffic when it traverses TSA-South.

Development traffic is that traffic generated by new development within the designated transportation service area, and constitutes the third and final component of future 2010 traffic volumes.

This section first addresses development trip generation for each service area, based upon the development projections contained in the *Land Use Assumptions Report*, and the trip distribution assumptions utilized in the analysis. Future pass-through traffic conditions are next described for each service area, incorporating existing traffic volumes in the service area, plus regional traffic growth (external to the transportation service area). Finally, future 2010 development traffic conditions are defined, incorporating existing traffic volumes, future pass-through traffic volumes, and future development traffic volumes.

Service Area Trip Generation

From the *Land Use Assumptions Report*, service area development vehicular trip generation was estimated for the 2010 weekday afternoon peak hour utilizing the Institute of Transportation Engineers publication, ***Trip Generation, 7th Edition***. The resulting 2010 weekday afternoon peak hour trip generation is summarized in **Table 10** for each service area.

Table 10. Service Area Development Vehicular "New" Trip Generation[1]

Development Type	ITE Code	Size	Weekday Afternoon New Trips [2] In	Out	Total
Service Area North					
Townhomes	230	50 units	25	13	38
Single Family Homes	210	483 units	309	183	492
Shopping Center	820	62,295 s.f.	176	193	369
Total for Service Area North			510	389	899
Service Area South					
Townhome	230	25 units	16	8	24
Single Family Homes	210	52 units	44	25	69
Light Industrial	110	158,349 s.f.	19	136	155
General Office	710	383,328 s.f.	85	415	500
Shopping Center	820	29,591 s.f.	89	96	185
Research and Development	760	383,328 s.f.	60	342	402
Daycare Center	565	10,000 s.f.	62	70	132
Nursing Home	620	52,848 s.f.	10	12	22
Community College	540	52,847 s.f.	37	41	778
Total for Service Area South			422	1145	1567
Total New Trip Generation			**932**	**1,534**	**2,466**

[1] The locations of developments are identified and illustrated in the *Land Use Assumptions Report.*
[2] Net of "pass-by" or diverted-link" trips.

Accordingly, Service Area North is estimated to experience an increase in total weekday afternoon peak hour trip generation of 899 new trips over the next five years, and Service Area South is estimated to experience an increase of 1567 new trips over the same period, both of which have been included in their respective with-development traffic analysis.

Trip Distribution

Vehicular traffic volumes generated by new development over the next five years were generally distributed to the area roadway network based on existing travel patterns determined from the ADT volumes (Figure 1) entering and exiting the Township, as well as the locations of specific future development parcels 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 11**.

Table 11. Directions of Approach and Departure

Roadway	External Location (to/from)	Arrival/Departure
Butler Pike	north of Skippack Pike (S.R. 0073)	4 %
Butler Pike	south of North Lane (S.R. 3015)	8 %
Bethlehem Pike (S.R. 2018)	north of Skippack Pike (S.R. 0073)	8 %
Bethlehem Pike (S.R. 2018)	south of West Valley Green Road	8 %
Skippack Pike (S.R. 0073)	west of Butler Pike	7 %
Church Road (S.R. 0073)	east of East Valley Green Road	4 %
Stenton Avenue (S.R. 3003)	east of Flourtown Road (S.R. 3007)	3 %
Stenton Avenue (S.R. 3003)	west of Butler Pike	4 %

Table 11. Directions of Approach and Departure (cont'd.)

Roadway	External Location (to/from)	Arrival/Departure
Flourtown Road	west of Butler Pike	4 %
Germantown Pike (S.R. 3053)	west of Butler Pike	9 %
Germantown Pike (S.R. 3053)	east of Church Road	5 %
Ridge Pike	west of Butler Pike	12 %
Ridge Pike	east of Manor Road	14 %
River Road	south of Barren Hill Road (S.R. 3011)	2 %
North Lane (S.R. 3015)	west of Butler Pike	2 %
Hector Street (S.R. 3059)	south of North Lane (S.R. 3015)	6 %

2010 Future Pass-Through Traffic

In order to determine 2010 future weekday afternoon peak hour pass-through traffic volumes, an annual traffic growth rate of one percent per year was applied to existing weekday afternoon peak hour traffic volumes to reflect regional traffic growth.

In addition to regional traffic growth, traffic associated with a number of developments located within surrounding municipalities was distributed through the service area roadway network, and is included in the future traffic projections. These developments represent specific known/proposed developments identified by staff of the surrounding municipalities, and were determined to potentially have a significant influence on the study roadways and intersections. The trip generation for these specific developments has been calculated, and is included in **Appendix F,** and the estimated portion of those development trips that will traverse the two service areas, was distributed to the study roadway and intersection network.

The 2010 future weekday afternoon peak hour pass-through traffic volumes are illustrated in **Figure 6**. Once again, these traffic volumes reflect the assignment of regional traffic (from regional traffic growth trends and known developments located within surrounding municipalities) and development traffic from one transportation service area which will pass through the other transportation service area to existing traffic volumes.

2010 Future Development Traffic

As explained previously, traffic generated by new development internal to each designated transportation service area constitutes the third and final component of future 2010 traffic. The 2010 future development traffic volumes were determined based on assignment of service area development traffic within each respective transportation service area to the study roadway network within that service area, and the addition of these volumes to 2010 future pass-through traffic volumes.

Total 2010 volumes, including both future pass-through traffic and future development traffic, are summarized in **Figure 7**.

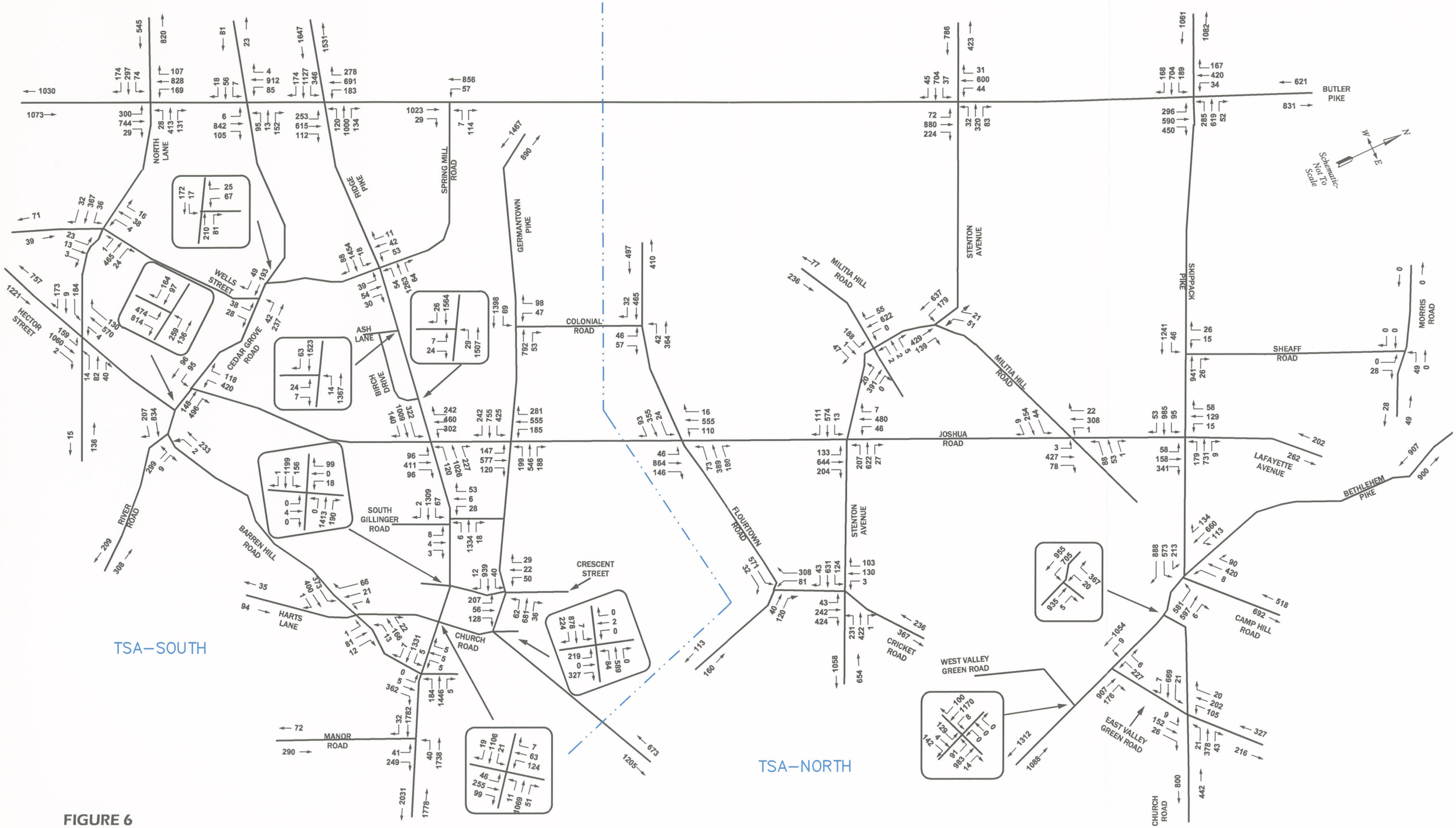

FIGURE 6

2010 Future Pass-Through Weekday Afternoon Peak Hour Traffic Volumes

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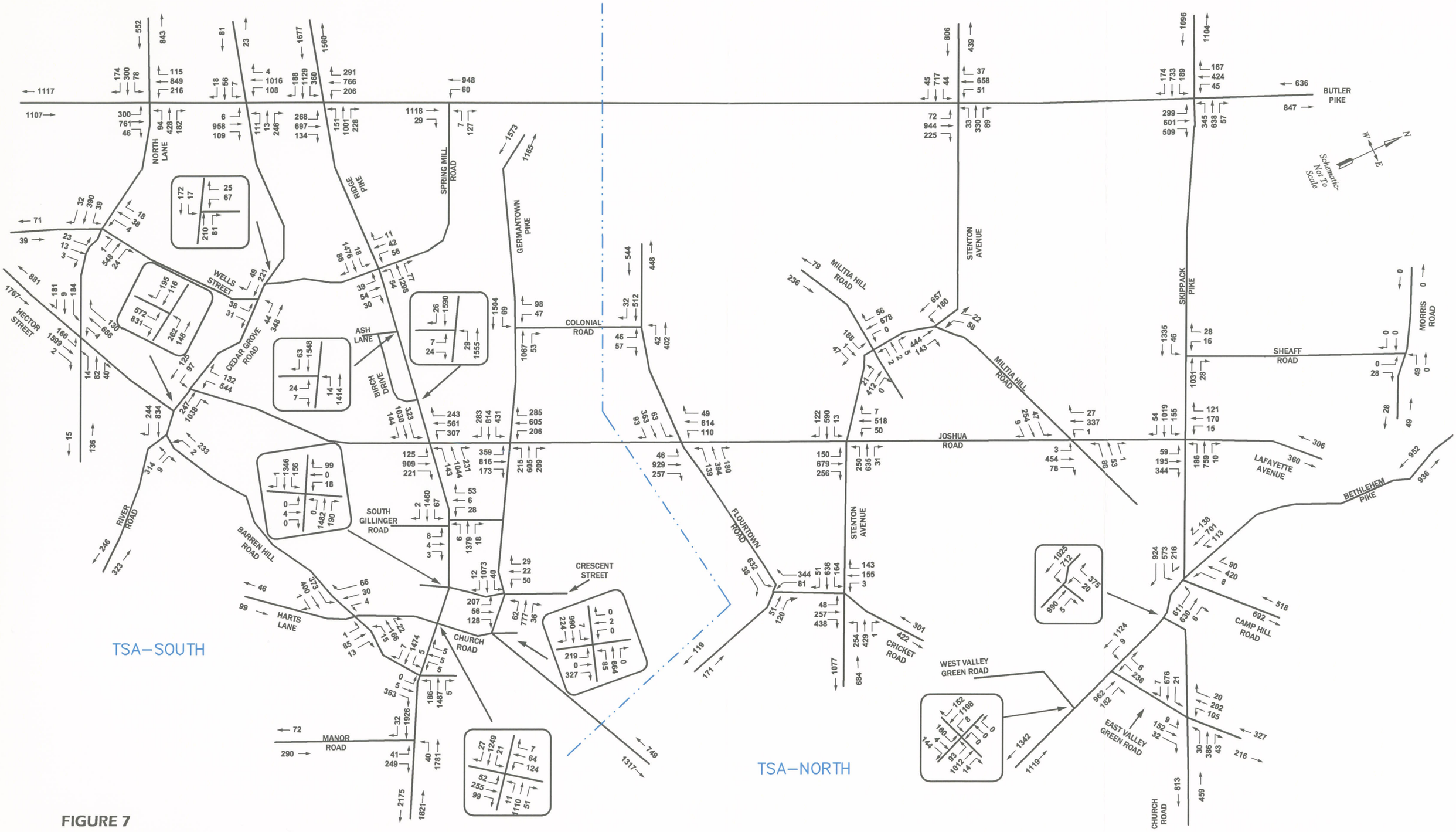

FIGURE 7

2010 Future Development Weekday Afternoon Peak Hour Traffic Volumes

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Programmed Improvements

Montgomery County is planning improvements at several intersections along Ridge Pike. These improvements are illustrated in **Figure 8**. Among these improvements, installation of eastbound and westbound left-turn lanes are planned at the intersection of Ridge Pike and Spring Mill Road. At the intersection of Ridge Pike and Joshua Road (S.R. 3014), installation of a southbound right-turn lane is planned. At the intersection of Ridge Pike and Barren Hill Road (S.R. 3011), installation of an eastbound left-turn lane and northbound right-turn lane are planned, and finally at the intersection of Ridge Pike and Manor Road, installation of an additional eastbound through lane is planned.

2010 Future Pass-Through Traffic Levels of Service

The future 2010 weekday afternoon pass-through traffic volumes illustrated in Figure 6 were subjected to the previously described capacity/level-of-service analysis procedures to determine 2010 pass-through levels of service. The detailed analyses are provided in **Appendix G**. As required by Act 209, the future 2010 pass-through conditions analysis for each study intersection and roadway is intended to determine the **incremental** traffic impacts and required mitigation of future pass-through traffic in comparison to existing traffic conditions **after** required existing traffic mitigation has been accounted for.

Figure 8 summarizes the results of the 2010 future pass-through traffic capacity/level-of-service analyses for the study intersections. Traffic operating conditions at the following 26 study intersections will not satisfy the preferred level-of-service criteria under 2010 future pass-through conditions:

Service Area North

- Skippack Pike (S.R. 0073) and Butler Pike
- Skippack Pike (S.R. 0073) and Sheaff Road
- Skippack Pike (S.R. 0073) and Joshua Road/Lafayette Avenue (S.R. 3014)
- Bethlehem Pike (S.R. 2018) and Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)
- Bethlehem Pike (S.R. 2018) and Church Road (S.R. 0073)
- Bethlehem Pike (S.R. 2018) and West Valley Green Road
- Joshua Road (S.R. 3014) and Militia Hill Road (S.R. 3005)
- Joshua Road (S.R. 3014) and Butler Pike
- Stenton Avenue (S.R. 3003) and Militia Hill Road – west (S.R. 3005)
- Stenton Avenue (S.R. 3003) and Joshua Road (S.R. 3014)
- Stenton Avenue (S.R. 3003) and Cricket Road
- Joshua Road (S.R. 3014) and Flourtown Road (S.R. 3007)

Service Area South

- Germantown Pike (S.R. 3053) and Colonial Road
- Germantown Pike (S.R. 3053) and Joshua Road (S.R. 3014)
- Germantown Pike (S.R. 3053) and Church Road
- Butler Pike and Spring Mill Road
- Ridge Pike and Spring Mill Road
- Ridge Pike and Butler Pike
- Ridge Pike and Ash Lane

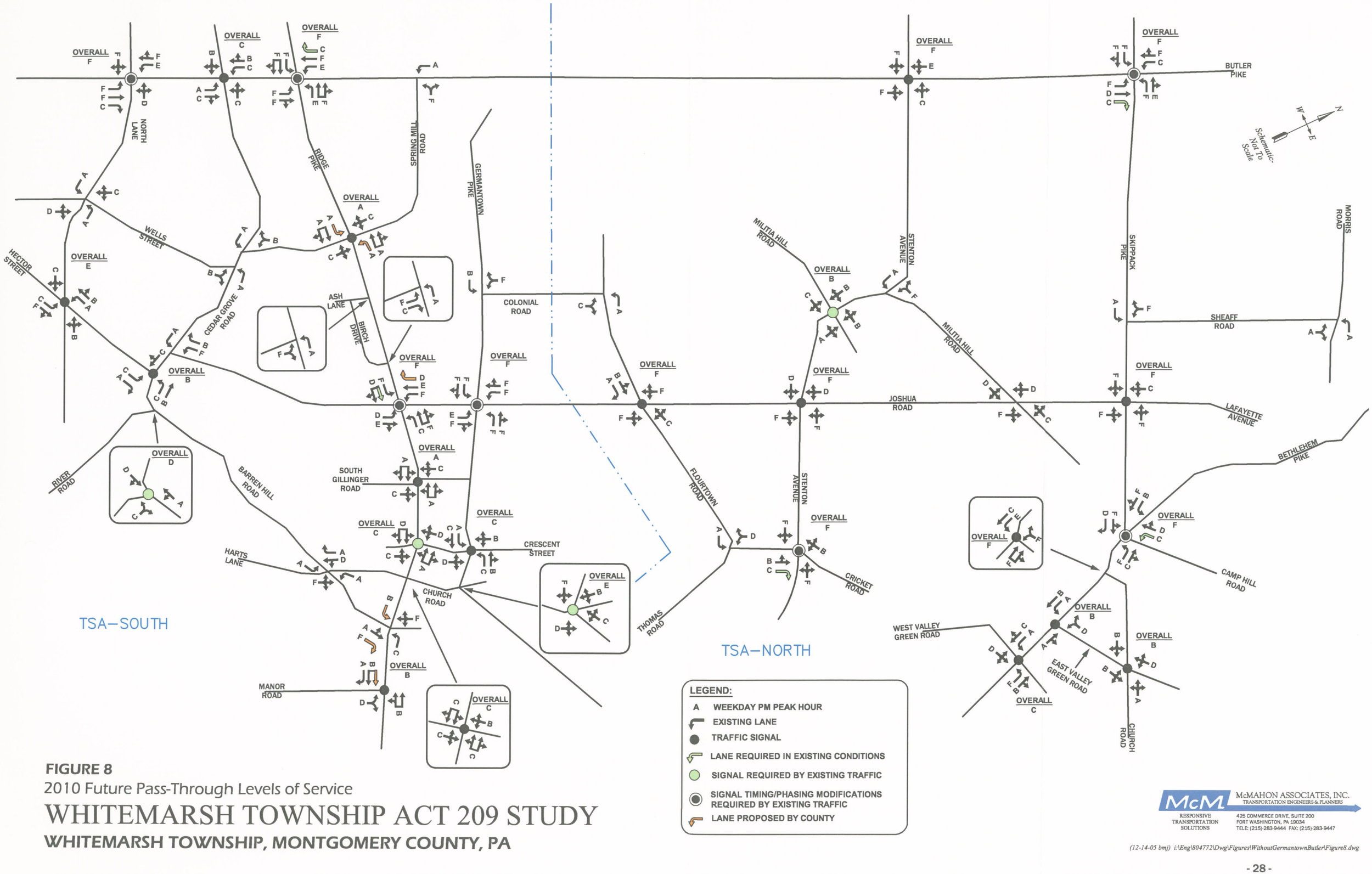

FIGURE 8

2010 Future Pass-Through Levels of Service

WHITEMARSH TOWNSHIP ACT 209 STUDY

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- Ridge Pike and Birch Drive
- Ridge Pike and Joshua Road (S.R. 3014)
- Ridge Pike and Barren Hill Road (S.R. 3011)
- Barren Hill Road (S.R. 3011) and Harts Lane
- Cedar Grove Road (S.R. 3011) and Joshua Road (S.R. 3014)
- North Lane (S.R. 3015) and Butler Pike
- North Lane (S.R. 3015) and Hector Street (S.R. 3059)

The roadway segment analysis indicates that each of the study roadways will satisfy the preferred level-of-service criteria. The results of the 2010 future pass-through roadway segment analysis are summarized in **Table 12** for each of the studied roadway segments.

Table 12. 2010 Future Pass-Through Roadway Segment Levels of Service

Roadway	Segment	LOS
Service Area North		
Butler Pike	Skippack Pike (S.R. 0073) to Stenton Avenue (S.R. 3003)	E
	Stenton Avenue (S.R. 3003) to Germantown Pike (S.R. 3053)	E
Bethlehem Pike (S.R. 2018)	Upper Dublin Township line to Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)	E
	West Valley Green Road to Springfield Township line	E
Skippack Pike (S.R. 0073)	Butler Pike to Sheaff Road	E
Joshua Road (S.R. 3014)	Stenton Avenue (S.R. 3003) to Militia Hill Road (S.R. 3005)	E
Service Area South		
Butler Pike	Spring Mill Road to Ridge Pike	E
Ridge Pike	Butler Pike to Spring Mill Road	B EB/B WB[1]
	Spring Mill Road to Joshua Road (S.R. 3014)	B EB/B WB[1]
	Manor Road to Springfield Township line	C EB/B WB[1]
Hector Street (S.R. 3059)	Cedar Grove Road to North Lane (S.R. 3015)	E

[1] EB = Eastbound, WB = Westbound

2010 Future Pass-Through Improvement Program

The additional improvements required to accommodate pass-through traffic are illustrated in **Figure 9.** These improvements are also summarized in more detail in **Tables 13 and 14** for each study

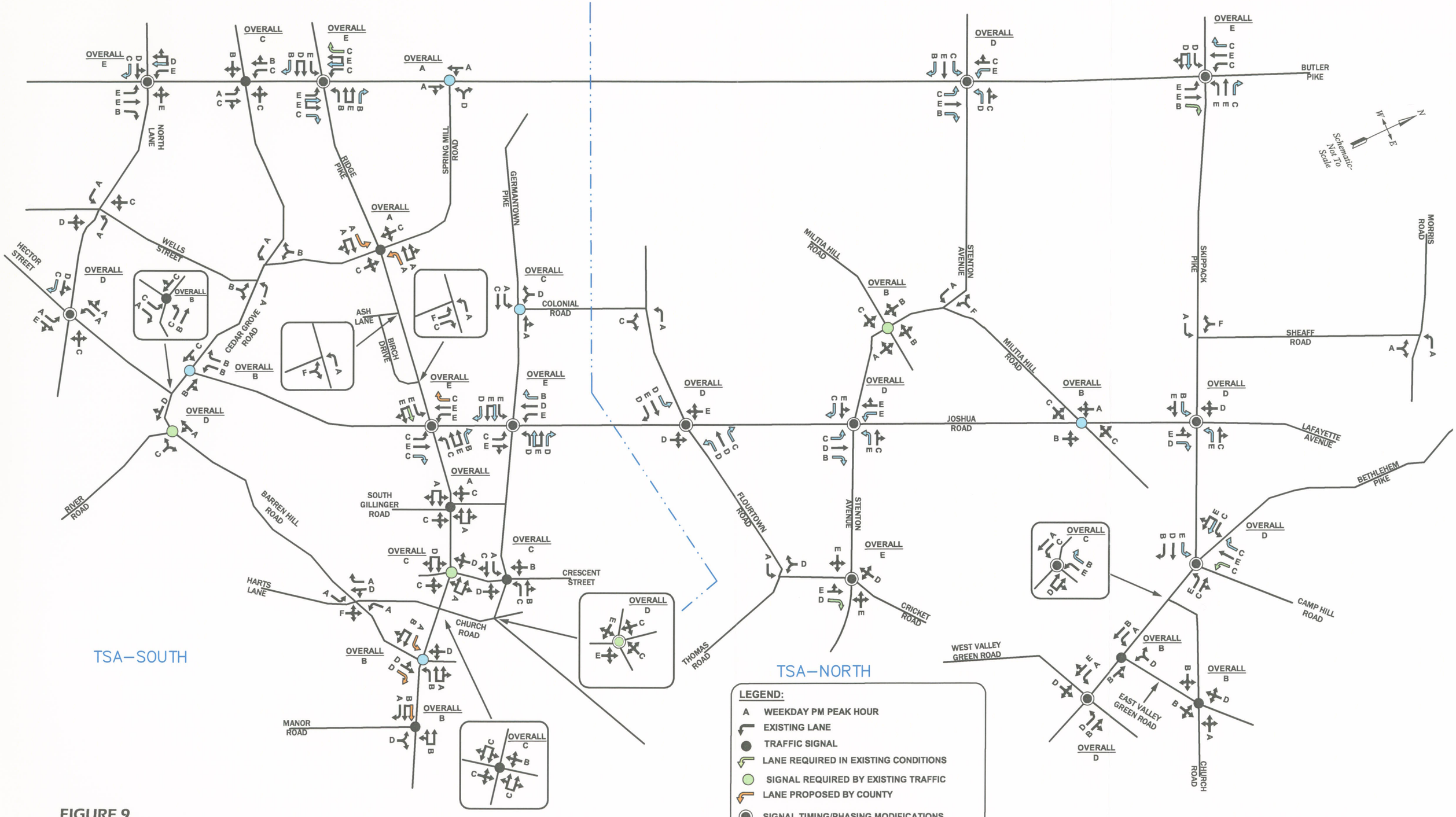

FIGURE 9

2010 Future Pass-Through Levels of Service with Improvements

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Table 13. Future Pass-Through Conditions Improvement Program for Study Intersections

Int No.	Intersection	Traffic Control	Recommended Improvements
	Service Area North		
1	Morris Road and Sheaff Lane	Stop Sign	No improvements required or recommended.
2	Skippack Pike and Butler Pike	Traffic Signal	**Widen Butler Pike to install SB right-turn lane, widen Skippack Pike to install WB right-turn lane and an additional EB through lane, traffic signal modifications.**
3	Skippack Pike and Sheaff Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
4	Skippack Pike and Joshua Road/Lafayette Avenue	Traffic Signal	**Widen Skippack Pike to install EB and WB left-turn lanes, widen Joshua Road to install NB right-turn lane, and traffic signal modifications.**
5	Skippack Pike and Bethlehem Pike/Camp Hill Road	Traffic Signal	**Widen Bethlehem Pike to install additional SB through lane, widen Skippack Pike to install EB left-turn lane, widen Camp Hill Road to install WB right-turn lane, and traffic signal modifications.**
6	Church Road and East Valley Green Road	Traffic Signal	No improvements required or recommended.
7	Bethlehem Pike and Church Road	Traffic Signal	**Widen Church Road to install WB right-turn lane, and traffic signal modifiations.**
8	Bethlehem Pike and East Valley Green Road	Traffic Signal	No improvements required or recommended.
9	Bethlehem Pike and West Valley Green Road	Traffic Signal	**Traffic Signal Modifications.**
10	Joshua Road and Militia Hill Road	Stop Sign	**Install Traffic Signal.**
11	Butler Pike and Stenton Avenue	Traffic Signal	**Widen Stenton Avenue to install EB and WB left-turn lanes, an EB right-turn lane, widen Butler Pike to install NB and SB left-turn lanes, NB right-turn lane, and traffic signal modifications.**
12	Stenton Avenue and West Militia Hill Road	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
13	Stenton Avenue and East Militia Hill Road	Traffic Signal	No improvements required or recommended.
14	Joshua Road and Stenton Avenue	Traffic Signal	**Widen Stenton Avenue to install WB left-turn lane, EB right-turn lane, widen Joshua Road to install NB and SB left-turn lanes, NB right-turn lane, and traffic signal modifications.**
15	Stenton Avenue and Cricket Road	Traffic Signal	**Traffic Signal Modifications.**
16	Thomas Road and Flourtown Road	Stop Sign	No improvements required or recommended.
17	Joshua Road and Flourtown Road	Traffic Signal	**Widen Flourtown Road to install EB and WB left-turn lanes, WB right-turn lane, and traffic signal modifications.**
18	Colonial Road and Flourtown Road	Stop Sign	No improvements required or recommended.

Table 13. Future Pass-Through Conditions Improvement Program for Study Intersections

Int No.	Intersection	Traffic Control	Recommended Improvements
	Service Area South		
19	Germantown Pike and Colonial Road	Stop Sign	**Install Traffic Signal.**
20	Germantown Pike and Joshua Road	Traffic Signal	**Widen Germantown Pike to install additional EB and WB through lanes, EB and WB right-turn lanes, widen Joshua Road to install SB right-turn lane, and traffic signal modifications.**
21	Germantown Pike and Crescent Street	Traffic Signal	No improvements required or recommended.
22	Germantown Pike and Church Road	Traffic Signal	**Traffic Signal Modifications.**
23	Butler Pike and Spring Mill Road	Stop Sign	**Install Traffic Signal.**
24	Ridge Pike and Butler Pike	Traffic Signal	**Widen Ridge Pike to install EB and WB right-turn lanes, widen Butler Pike to install additional NB and SB through lanes, install NB right-turn lane, and traffic signal modifications.**
25	Ridge Pike and Spring Mill Road	Traffic Signal	*Widen Ridge Pike to install EB and WB left-turn lanes. (1)*
26	Ridge Pike and Ash Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
27	Ridge Pike and Birch Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
28	Ridge Pike and Joshua Road	Traffic Signal	**Widen Ridge Pike to install WB right-turn lane, widen Joshua Road to install NB right-turn lane, and traffic signal modifications.** *Widen Joshua Road to install SB right-turn lane. (1)*
29	Ridge Pike and South Gillinger Road	Traffic Signal	No improvements required or recommended.
30	Ridge Pike and Crescent Street	Traffic Signal	No improvements required or recommended.
31	Ridge Pike and Church Road	Traffic Signal	No improvements required or recommended.
32	Ridge Pike and Barren Hill Road	Stop Sign	**Install Traffic Signal.** *Widen Ridge Pike to install EB left-turn lane, widen Barren Hill Road to install NB right-turn lane. (1)*
33	Ridge Pike and Manor Road	Traffic Signal	*Widen Ridge Pike to install additional EB through lane. (1)*
34	Barren Hill Road and Harts Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
35	Butler Pike and Cedar Grove Road	Traffic Signal	No improvements required or recommended.
36	Cedar Grove Road and Spring Mill Road	Stop Sign	No improvements required or recommended.
37	Cedar Grove Road and Wells Street	Stop Sign	No improvements required or recommended.
38	Butler Pike and North Lane	Traffic Signal	**Widen North Lane to install EB right-turn lane, widen Butler Pike to install additional SB through lane, and traffic signal modifications.**
39	Joshua Road and Cedar Grove Road	Stop Sign	**Install Traffic Signal.**
40	Cedar Grove Road and Hector Street	Traffic Signal	No improvements required or recommended.
41	Barren Hill Road and River Road	Traffic Signal	No improvements required or recommended.
42	North Lane and Wells Street	Stop Sign	No improvements required or recommended.
43	Hector Street and North Lane	Traffic Signal	Widen North Lane to install EB right-turn lane, and traffic signal modifications.

(1) Planned Improvement by County

Table 14. Future Pass-Through Conditions Improvement Program for Study Roadways

Roadway	Segment	Recommended Improvement
Service Area North		
Butler Pike	Skippack Pike to Stenton Avenue	No improvements required or recommended.
	Stenton Avenue to Germantown Pike	No improvements required or recommended.
Bethlehem Pike	Upper Dublin Township to Skippack Pike/Camp Hill Road	No improvements required or recommended.
	West Valley Green Road to Springfield Township	No improvements required or recommended.
Skippack Pike	Butler Pike to Sheaff Road	No improvements required or recommended.
Joshua Road	Stenton Avenue to Militia Hill Road	No improvements required or recommended.
Service Area South		
Butler Pike	Spring Mill Road to Ridge Pike	No improvements required or recommended.
Ridge Pike	Butler Pike to Spring Mill Road	No improvements required or recommended.
	Spring Mill Road to Joshua Road	No improvements required or recommended.
	Manor Road to Springfield Township line	No improvements required or recommended.
Hector Street	Cedar Grove Road to North Lane	No improvements required or recommended.

intersection and roadway, respectively. Improvements will be required at 20 study intersections in order to achieve the preferred levels of service under pass-through traffic conditions. At the other six intersections with deficient operations, all are currently unsignalized, and will not meet traffic signal warrants. The future pass-through Capital Improvements Program includes new traffic signal installations, as well as geometric (widening) improvements.

2010 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 2010 development levels of service, and the detailed analyses are provided in **Appendix H**. The 2010 future development conditions are illustrated in **Figure 10**, and indicate that the following 22 study intersections will not satisfy the preferred level-of-service criteria and will require further improvements beyond the previously identified future pass-through improvements:

Service Area North

- Skippack Pike (S.R. 0073) and Butler Pike
- Skippack Pike (S.R. 0073) and Sheaff Road
- Skippack Pike (S.R. 0073) and Joshua Road/Lafayette Avenue (S.R. 3014)
- Bethlehem Pike (S.R. 2018) and Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)
- Bethlehem Pike (S.R. 2018) and West Valley Green Road
- Stenton Avenue (S.R. 3003) and Butler Pike
- Stenton Avenue (S.R. 3003) and Militia Hill Road – west (S.R. 3005)
- Stenton Avenue (S.R. 3003) and Joshua Road (S.R. 3014)
- Stenton Avenue (S.R. 3003) and Cricket Road
- Joshua Road (S.R. 3014) and Flourtown Road (S.R. 3007)

Service Area South

- Germantown Pike (S.R. 3053) and Joshua Road (S.R. 3014)
- Germantown Pike (S.R. 3053) and Church Road
- Ridge Pike and Butler Pike
- Ridge Pike and Ash Lane
- Ridge Pike and Birch Drive
- Ridge Pike and Joshua Road (S.R. 3014)
- Ridge Pike and Crescent Street
- Barren Hill Road (S.R. 3011) and Harts Lane
- Cedar Grove Road (S.R. 3011) and Butler Pike
- Cedar Grove Road (S.R. 3011) and Joshua Road (S.R. 3014)
- North Lane (S.R. 3015) and Butler Pike
- North Lane (S.R. 3015) and Hector Street (S.R. 3059)

The roadway segment analysis indicates that each of the study roadways will satisfy the preferred level-of-service criteria with the exception of Hector Street between Cedar Grove Road and North Lane. The results of the 2010 future development roadway segment analysis without improvements are shown in **Table 15** for each of the studied roadway segments.

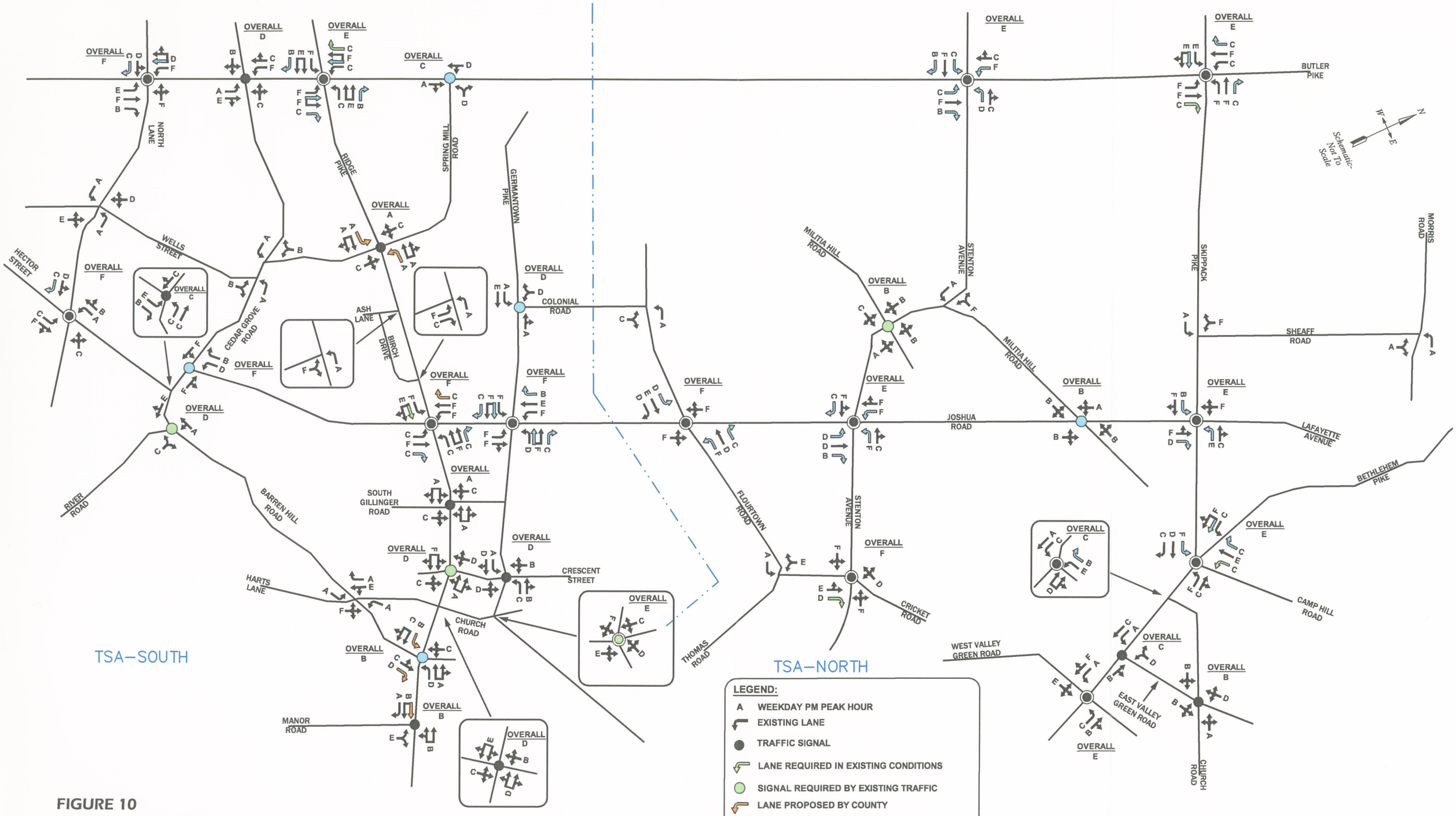

FIGURE 10

2010 Future Development Levels of Service

WHITEMARSH TOWNSHIP ACT 209 STUDY

WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON ASSOCIATES, INC.
TRANSPORTATION ENGINEERS & PLANNERS
RESPONSIVE TRANSPORTATION SOLUTIONS
425 COMMERCE DRIVE, SUITE 200
FORT WASHINGTON, PA 19034
TELE: (215)-283-9444 FAX: (215)-283-9447

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Table 15. 2010 Future Development Roadway Segment Levels of Service without Improvements

Roadway	Segment	LOS
Service Area North		
Butler Pike	Skippack Pike (S.R. 0073) to Stenton Avenue (S.R. 3003)	E
	Stenton Avenue (S.R. 3003) to Germantown Pike (S.R. 3053)	E
Bethlehem Pike (S.R. 2018)	Upper Dublin Township line to Skippack Pike (S.R. 0073)/Camp Hill Road (S.R. 2028)	E
	West Valley Green Road to Springfield Township line	E
Skippack Pike (S.R. 0073)	Butler Pike to Sheaff Road	E
Joshua Road (S.R. 3014)	Stenton Avenue (S.R. 3003) to Militia Hill Road (S.R. 3005)	E
Service Area South		
Butler Pike	Spring Mill Road to Ridge Pike	E
Ridge Pike	Butler Pike to Spring Mill Road	B EB/B WB[1]
	Spring Mill Road to Joshua Road (S.R. 3014)	C EB/B WB[1]
	Manor Road to Springfield Township line	C EB/C WB[1]
Hector Street (S.R. 3059)	Cedar Grove Road to North Lane (S.R. 3015)	F

[1] EB = Eastbound, WB = Westbound

2010 Future Development Improvement Program

The improvements necessary to achieve the preferred level-of-service criteria under 2010 development traffic conditions at the study intersections and roadways after existing and pass-through deficiencies have been mitigated are summarized in **Tables 16 and 17**, respectively, and are also illustrated in **Figure 11**. In summary, improvements will be required at 17 study intersections and one roadway segment to accommodate development-generated traffic within the transportation service areas and maintain the preferred levels of service. At the other five intersections with deficient operations, all are currently unsignalized, and will not meet traffic signal warrants. The future development Capital Improvements Program includes new traffic signal installations, as well as geometric (widening) improvements.

Table 16. Future Development Conditions Improvement Program for Study Intersections

Int No.	Intersection	Traffic Control	Recommended Improvements
	Service Area North		
1	Morris Road and Sheaff Lane	Stop Sign	No improvements required or recommended.
2	Skippack Pike and Butler Pike	Traffic Signal	**Widen Skippack Pike to install EB right-turn lane, additional WB through lane, and traffic signal modifications.**
3	Skippack Pike and Sheaff Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
4	Skippack Pike and Joshua Road/Lafayette Avenue	Traffic Signal	**Widen Joshua Road to install NB and SB left-turn lanes, SB right-turn lane, and traffic signal modifications.**
5	Skippack Pike and Bethlehem Pike/Camp Hill Road	Traffic Signal	**Widen Bethlehem Pike to install SB right-turn lane, and traffic signal modifications.**
6	Church Road and East Valley Green Road	Traffic Signal	No improvements required or recommended.
7	Bethlehem Pike and Church Road	Traffic Signal	No improvements required or recommended.
8	Bethlehem Pike and East Valley Green Road	Traffic Signal	No improvements required or recommended.
9	Bethlehem Pike and West Valley Green Road	Traffic Signal	**Traffic Signal Modifications.**
10	Joshua Road and Militia Hill Road	Traffic Signal	No improvements required or recommended.
11	Butler Pike and Stenton Avenue	Traffic Signal	**Widen Stenton Avenue to install additional EB through lane, WB right-turn lane, widen Butler Pike to install SB right-turn lane, and traffic signal modifications.**
12	Stenton Avenue and West Militia Hill Road	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
13	Stenton Avenue and East Militia Hill Road	Traffic Signal	No improvements required or recommended.
14	Joshua Road and Stenton Avenue	Traffic Signal	**Widen Stenton Avenue to install EB left-turn lane, WB right-turn lane, widen Joshua Road to install additional NB and SB through lanes, and traffic signal modifications.**
15	Stenton Avenue and Cricket Road	Traffic Signal	**Widen Stenton Avenue to install WB left-turn lane, widen Cricket Road to install SB right-turn lane, and traffic signal modifications.**
16	Thomas Road and Flourtown Road	Stop Sign	No improvements required or recommended.
17	Joshua Road and Flourtown Road	Traffic Signal	**Widen Joshua Road to install NB and SB left-turn lanes, NB right-turn lane, and traffic signal modifications.**
18	Colonial Road and Flourtown Road	Stop Sign	No improvements required or recommended.

Table 16. Future Development Conditions Improvement Program for Study Intersections

Int No.	Intersection	Traffic Control	Recommended Improvements
	Service Area South		
19	Germantown Pike and Colonial Road	Traffic Signal	No improvements required or recommended.
20	Germantown Pike and Joshua Road	Traffic Signal	**Widen Joshua Road to install additional NB and SB through lanes, and traffic signal modifications.**
21	Germantown Pike and Crescent Street	Traffic Signal	No improvements required or recommended.
22	Germantown Pike and Church Road	Traffic Signal	**Widen Germantown Pike to install EB and WB left-turn lanes, widen Church Road to install NB right-turn lane, and traffic signal modifications.**
23	Butler Pike and Spring Mill Road	Traffic Signal	No improvements required or recommended.
24	Ridge Pike and Butler Pike	Traffic Signal	**Widen Ridge Pike to install additional EB and WB through lanes, and traffic signal modifications.**
25	Ridge Pike and Spring Mill Road	Traffic Signal	No improvements required or recommended.
26	Ridge Pike and Ash Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
27	Ridge Pike and Birch Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
28	Ridge Pike and Joshua Road	Traffic Signal	**Widen Ridge Pike to install EB left-turn lane, widen Joshua Road to install additional NB through lane, and traffic signal modifications.**
29	Ridge Pike and South Gillinger Road	Traffic Signal	No improvements required or recommended.
30	Ridge Pike and Crescent Street	Traffic Signal	**Traffic Signal Modifications.**
31	Ridge Pike and Church Road	Traffic Signal	No improvements required or recommended.
32	Ridge Pike and Barren Hill Road	Traffic Signal	No improvements required or recommended.
33	Ridge Pike and Manor Road	Traffic Signal	No improvements required or recommended.
34	Barren Hill Road and Harts Lane	Stop Sign	No improvements required or recommended as a traffic signal is not warranted.
35	Butler Pike and Cedar Grove Road	Traffic Signal	**Traffic Signal Modifications.**
36	Cedar Grove Road and Spring Mill Road	Stop Sign	No improvements required or recommended.
37	Cedar Grove Road and Wells Street	Stop Sign	No improvements required or recommended.
38	Butler Pike and North Lane	Traffic Signal	**Widen North lane to install WB left-turn lane, widen Butler Pike to install additional NB through lane, SB right-turn lane, and traffic signal modifications.**
39	Joshua Road and Cedar Grove Road	Traffic Signal	**Widen Cedar Grove Road to install WB right-turn lane, and traffic signal modifications.**
40	Cedar Grove Road and Hector Street	Traffic Signal	No improvements required or recommended.
41	Barren Hill Road and River Road	Traffic Signal	No improvements required or recommended.
42	North Lane and Wells Street	Stop Sign	No improvements required or recommended.
43	Hector Street and North Lane	Traffic Signal	**Widen Hector Street to install additional NB through lane, and traffic signal modifications.**

Table 17. Future Development Conditions Improvement Program for Study Roadways

Roadway	Segment	Recommended Improvement
Service Area North		
Butler Pike	Skippack Pike to Stenton Avenue	No improvements required or recommended.
	Stenton Avenue to Germantown Pike	No improvements required or recommended.
Bethlehem Pike	Upper Dublin Township to Skippack Pike/Camp Hill Road	No improvements required or recommended.
	West Valley Green Road to Springfield Township	No improvements required or recommended.
Skippack Pike	Butler Pike to Sheaff Road	No improvements required or recommended.
Joshua Road	Stenton Avenue to Militia Hill Road	No improvements required or recommended.
Service Area South		
Butler Pike	Spring Mill Road to Ridge Pike	No improvements required or recommended.
Ridge Pike	Butler Pike to Spring Mill Road	No improvements required or recommended.
	Spring Mill Road to Joshua Road	No improvements required or recommended.
	Manor Road to Springfield Township line	No improvements required or recommended.
Hector Street	Cedar Grove Road to North Lane	**Widen Hector Street to provide an additional through lane in each direction.**

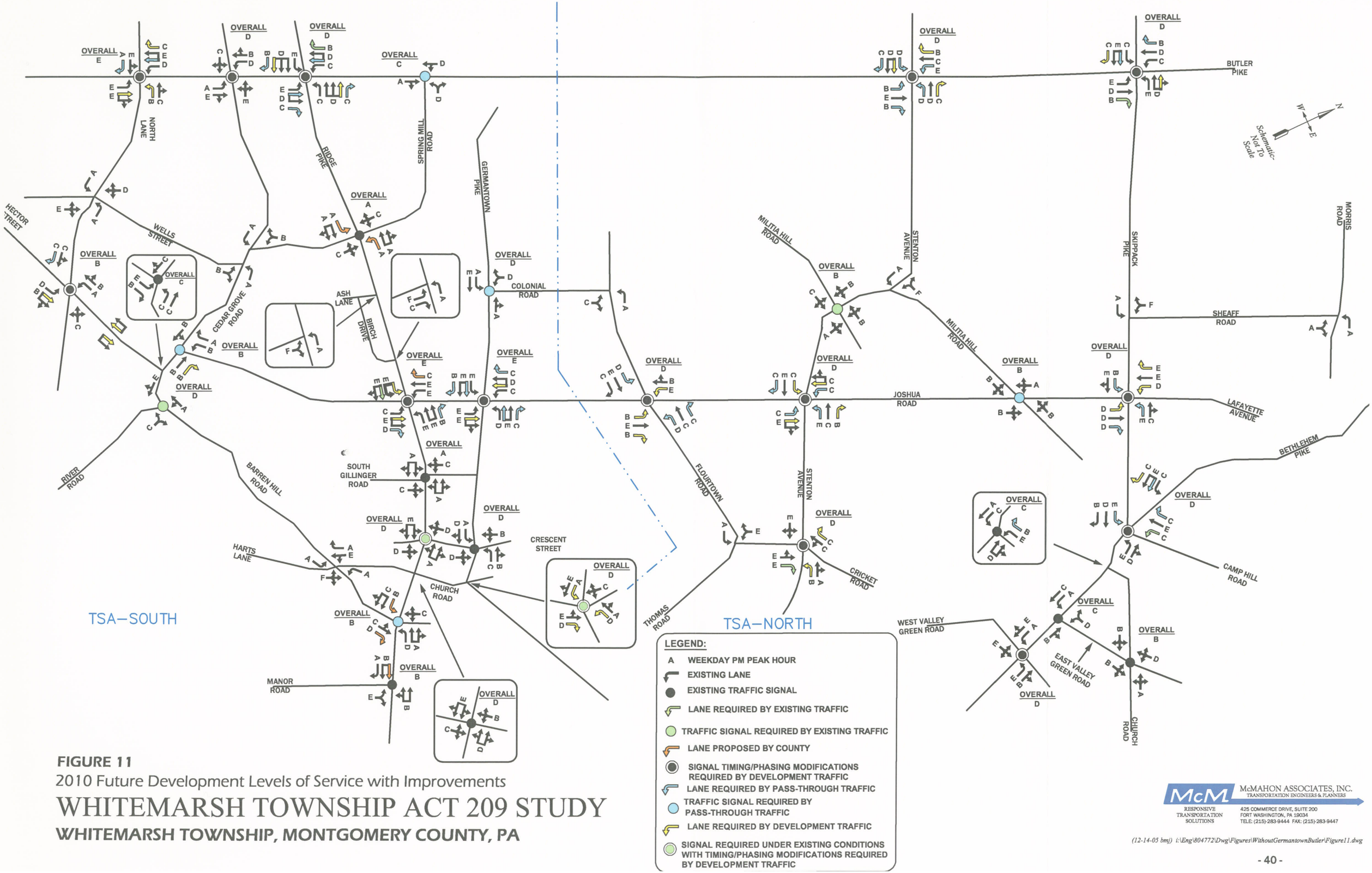

FIGURE 11

2010 Future Development Levels of Service with Improvements

WHITEMARSH TOWNSHIP ACT 209 STUDY

WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON ASSOCIATES, INC.
TRANSPORTATION ENGINEERS & PLANNERS
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TRANSPORTATION CAPITAL IMPROVEMENTS PLAN

This section summarizes Whitemarsh Township's *Transportation Capital Improvements Plan,* resulting from the *Roadway Sufficiency Analysis.* In accordance with Act 209, the following public notification requirements were met:

1. Public notice of a public hearing on the *Transportation Capital Improvements Plan* was published two successive weeks, between seven and thirty days from the date of the hearing.
2. The *Transportation Capital Improvements Plan* was available for public inspection at the Township building at least ten working days prior to the hearing.
3. The public hearing was held on the *Transportation Capital Improvements Plan* to receive comments on _____.

Following the public hearing, the *Transportation Capital Improvements Plan* was adopted by the Township Board of Supervisors by resolution, along with the Roadway Sufficiency Analysis, on _____.

The *Transportation Capital Improvements Plan* consists of three sections, which are described below, and includes the ***Existing Transportation Capital Improvements Program, Future Pass-Through Transportation Capital Improvements Program***, and the ***Future Development Transportation Capital Improvements Program***.

Existing Transportation Capital Improvements Program

The Existing Transportation Capital Improvement Program is summarized in **Table 18,** and details the improvements necessary to achieve the preferred levels of service under existing 2005 conditions. Table 18 also provides cost allocations for the improvements, indicating the portions of the total cost for which the Township, Montgomery County, and PennDOT are responsible. **The total cost of the Existing Transportation Capital Improvements Program is approximately $784,000 for Transportation Service Area North, and $1,616,000 for Transportation Service Area South.** The anticipated completion year for each of the improvements is also included in Table 18.

Future Pass-Through Transportation Capital Improvements Program

The Future Pass-Through Transportation Capital Improvements Program is summarized in **Table 19,** and details the additional improvements necessary to achieve the preferred levels of service under future 2010 pass-through conditions. Table 19 also provides cost allocations for the improvements, indicating the portions of the total cost for which the Township, Montgomery County, and PennDOT are responsible. **The total cost of the Future Pass-through Transportation Capital Improvements Program is approximately $6,949,000 for Transportation Service Area North, and $5,449,000 for Transportation Service Area South .** The anticipated completion year for each of the improvements is also included in Table 19.

Table 18
Existing Improvements Cost Estimates - TSA North

Int. No.	Intersection or Corridor	Improvements Required	Total Project Cost	Allocated Funding			Construction Completion
				PennDOT Costs	County Costs	Township Costs	
2	Skippack Pike and Butler Pike	Install NB right-turn lane, Traffic Signal Modifications	$210,000	$52,500	$52,500	$105,000	2010
5	Bethlehem Pike and Camphill Road/Skippack Pike	Install WB left-turn lane, Traffic Signal Modifications	$286,000	$143,000	$0	$143,000	2010
13	Stenton Avenue and East Militia Hill Road	Install Traffic Signal	$168,000	$84,000	$0	$84,000	2010
15	Stenton Avenue and Cricket Road	Install NB right-turn lane, Traffic Signal Modifications	$120,000	$30,000	$0	$90,000	2010
		Totals	$784,000	$309,500	$52,500	$422,000	

Existing Improvements Cost Estimates - TSA South

Int. No.	Intersection or Corridor	Improvements Required	Total Project Cost	Allocated Funding			Construction Completion
				PennDOT Costs	County Costs	Township Costs	
20	Germantown Pike and Joshua Road	Traffic Signal Modifications	$76,000	$38,000	$0	$38,000	2010
22	Germantown Pike and Church Road	Install Traffic Signal	$168,000	$56,000	$0	$112,000	2010
24	Butler Pike and Ridge Pike	Install SB right-turn lane, Traffic Signal Modifications	$319,000	$0	$159,500	$159,500	2010
28	Ridge Pike and Joshua Road	Install additional EB through lane, Traffic Signal Modifications	$749,000	$187,250	$187,250	$374,500	2010
30	Ridge Pike and Crescent Street	Install Traffic Signal	$137,000	$0	$68,500	$68,500	2010
38	Butler Pike and North Lane	Traffic Signal Modifications	$15,000	$3,750	$3,750	$7,500	2010
41	River Road and Barren Hill Road	Install Traffic Signal	$152,000	$50,667	$0	$101,333	2010
		Totals	$1,616,000	$335,667	$419,000	$861,333	
			$2,400,000	*$645,167*	*$471,500*	*$1,283,333*	
				26.9%	*19.6%*	*53.5%*	

Table 19
Pass-Through Improvements Cost Estimates - TSA North

Int. No.	Intersection or Corridor	Improvements Required	Total Project Cost	Allocated Funding			Construction Completion
				PennDOT Costs	County Costs	Township Costs	
2	Skippack Pike and Butler Pike	Install SB right-turn lane, WB right-turn lane, an additional EB through lane, and Traffic Signal Modifications	$922,000	$230,500	$230,500	*$461,000*	2010
4	Skippack Pike and Joshua Road	Install EB and WB left-turn lanes, NB right- turn lane, and Traffic Signal Modifications	$716,000	$358,000	*$0*	*$358,000*	2010
5	Bethlehem Pike and Camp Hill Road/Skippack Pike	Install an additional SB through lane, WB right-turn lane, EB left-turn lane, and Traffic Signal Modifications	$2,418,000	$1,209,000	$0	*$1,209,000*	2010
7	Bethlehem Pike and Church Road	Install WB right-turn lane, and Traffic Signal Modifications	$196,000	$98,000	$0	*$98,000*	2010
9	Bethlehem Pike and W. Valley Green Road	Traffic Signal Modifications	$15,000	$5,000	$0	*$10,000*	
10	Joshua Road and Militia Hill Road	Install Traffic Signal	$168,000	$84,000	$0	*$84,000*	2010
11	Butler Pike and Stenton Avenue	Install EB and WB left-turn lanes, EB right- turn lane, NB and SB left-turn lanes, NB right -turn lane, and Traffic Signal Modifications.	$953,000	*$238,250*	*$238,250*	*$476,500*	2010
14	Stenton Avenue and Joshua Road	Install WB left-turn lane, EB right-turn lane, NB and SB left-turn lanes, NB right-turn lane, and Traffic Signal Modifications.	$968,000	*$484,000*	$0	*$484,000*	2010
15	Stenton Avenue and Cricket Road	Traffic Signal Modifications	$15,000	*$3,750*	$0	*$11,250*	2010
17	Flourtown Road and Joshua Road	Install EB and WB left-turn lanes, WB right- turn lane, and Traffic Signal Modifications.	$578,000	*$289,000*	$0	*$289,000*	2010
		Totals	$6,949,000	$2,999,500	$468,750	$3,480,750	

Pass-Through Improvements Cost Estimates - TSA South

Int. No.	Intersection or Corridor	Improvements Required	Total Project Cost	Allocated Funding			Construction Completion
				PennDOT Costs	County Costs	Township Costs	
20	Germantown Pike and Joshua Road	Install additional EB and WB through lanes, EB and WB right-turn lanes, SB right-turn lane, and Traffic Signal Modifications	$1,863,000	$931,500	$0	*$931,500*	2010
22	Germantown Pike and Church Road	Traffic Signal Modifications	$15,000	$5,000	$0	*$10,000*	2010
23	Butler Pike and Spring Mill Road	Install Traffic Signal	$168,000	$0	*$56,000*	*$112,000*	2010
24	Ridge Pike and Butler Pike	Install EB and WB right-turn lanes, install additional NB and SB through lanes, install NB right-turn lane, Traffic Signal Modifications	$1,697,000	*$0*	*$848,500*	*$848,500*	2010
28	Ridge Pike and Joshua Road	Install WB right-turn lane, NB right-turn lane, Traffic Signal Modifications	$397,000	*$99,250*	*$99,250*	*$198,500*	2010
32	Ridge Pike and Barren Hill Road	Install Traffic Signal	$137,000	*$34,250*	*$34,250*	*$68,500*	2010
38	Butler Pike and North Lane	Install EB right-turn lane, additional SB through lane, Traffic Signal Modifications	$891,000	*$222,750*	*$222,750*	*$445,500*	2010
39	Joshua Road and Cedar Grove Road	Install Traffic Signal	$137,000	*$68,500*	$0	*$68,500*	2010
43	North Lane and Hector Street	Install EB right-turn lane, Traffic Signal Modifications	$144,000	*$72,000*	$0	*$72,000*	2010
		Totals	$5,449,000	$1,433,250	$1,260,750	$2,755,000	
			$12,398,000	*$4,432,750*	*$1,729,500*	*$6,235,750*	
				35.8%	*13.9%*	*50.3%*	

Future Development Transportation Capital Improvements Program

The Future Development Transportation Capital Improvements Program is summarized in **Table 20,** and details the improvements necessary to achieve the preferred levels of service under future 2010 development traffic conditions. Table 20 also provides cost allocations for the improvements, indicating the portions of the total cost for which the Township, Montgomery County, PennDOT, and future development are responsible. **The total cost of the Future Development Transportation Capital Improvement Program is approximately $4,850,000 for Transportation Service Area North and $7,710,000 for Transportation Service Area South.** The anticipated completion year for each of the improvements is also included in Table 20.

Improvements Summary

The total costs of the Whitemarsh Township *Transportation Capital Improvements Plan*, which includes existing, pass-through, and development improvements, are summarized in **Table 21**. As indicated, the total cost of the *Transportation Capital Improvements Plan* is approximately **$27,358,000,** and is allocated to the Township (approximately 27 percent), to the County (approximately 13 percent), to PennDOT (approximately 36 percent), and to future development (approximately 24 percent).

Impact Fee

The impact fee calculations for development improvements are summarized in **Table 22** for the transportation service area.

Table 22. Transportation Impact Fee

Transportation Service Area	Development Capital Improvement Costs[1]	Development Trips	Impact Fee[2],[3]
TSA North	$2,540,078	899 trips	$***2,825***
TSA South	$3,963,627	1,567 trips	$***2,529***

[1] Inclusive of the prorata share of costs incurred for the completion of the *Roadway Sufficiency Analysis* that is attributable to development ($2,328 as allocated by the cost of development-warranted improvements in TSA North and $5,043 as allocated by the cost of development-warranted improvements in TSA South).

[2] To be assessed on a per weekday afternoon "new" peak hour trip basis.

[3] Development capital improvement costs divided by new development trips (rounded down to nearest dollar).

Table 20
Development Improvements Cost Estimates - TSA North

Int. No.	Intersection or Corridor	Improvements Required	Total Project Cost	Allocated Funding			Construction Completion
				PennDOT Costs	County Costs	Developer Costs	
2	Skippack Pike and Butler Pike	Install EB right-turn lane, additional WB through lane, Traffic Signal Modifications	$765,000	$191,250	$191,250	**$382,500**	2010
4	Skippack Pike and Joshua Road	Install NB and SB left-turn lanes, SB right- turn lane, and Traffic Signal Modifications	$550,000	$275,000	*$0*	**$275,000**	2010
5	Bethlehem Pike and Camp Hill Road/Skippack Pike	Install SB right-turn lane, Traffic Signal Modifications	$205,000	$102,500	*$0*	**$102,500**	2010
7	Bethlehem Pike and Church Road	Traffic Signal Modifications	$0	$0	*$0*	**$0**	2010
9	Bethlehem Pike and W. Valley Green Road	Traffic Signal Modifications	$15,000	$5,000	*$0*	**$10,000**	
11	Butler Pike and Stenton Avenue	Install additional EB through lane, WB right- turn lane, SB right-turn lane, and Traffic Signal Modifications	$927,000	*$231,750*	*$231,750*	**$463,500**	2010
14	Stenton Avenue and Joshua Road	Install EB left-turn lane, WB right-turn lane, additional NB and SB through lanes, Traffic Signal Modifications	$1,329,000	*$664,500*	*$0*	**$664,500**	2010
15	Stenton Avenue and Cricket Road	Install WB left-turn lane, SB right-turn lane, and Traffic Signal Modifications	$441,000	*$110,250*	*$0*	**$330,750**	2010
17	Flourtown Road and Joshua Road	Install NB and SB left-turn lanes, NB right- turn lane, and Traffic Signal Modifications	$618,000	*$309,000*	*$0*	**$309,000**	2010
		Totals	$4,850,000	$1,889,250	$423,000	**$2,537,750**	

Development Improvements Cost Estimates - TSA South

Int. No.	Intersection or Corridor	Improvements Required	Total Project Cost	Allocated Funding			Construction Completion
				PennDOT Costs	County Costs	Township Costs	
20	Germantown Pike and Joshua Road	Install additional NB and SB through lanes, Traffic Signal Modifications	$1,223,000	$611,500	*$0*	**$611,500**	2010
22	Germantown Pike and Church Road	Install EB and WB left-turn lanes, NB right- turn lane, and Traffic Signal Modifications	$599,000	$199,667	*$0*	**$399,333**	2010
24	Ridge Pike and Butler Pike	Install additional EB and WB through lanes, Traffic Signal Modifications	$1,387,000	*$0*	$693,500	**$693,500**	2010
28	Ridge Pike and Joshua Road	Install additional EB left-turn lane, additional NB through lane, and Traffic Signal Modifications	$1,212,000	*$303,000*	*$303,000*	**$606,000**	2010
30	Ridge Pike and Crescent Street	Traffic Signal Modifications	$15,000	*$0*	$3,750	**$11,250**	2010
35	Butler Pike and Cedar Grove Road	Traffic Signal Modifications	$15,000	*$3,750*	$3,750	**$7,500**	2010
38	Butler Pike and North Lane	Install WB left-turn lane, additional NB through lane, SB right-turn lane, and Traffic Signal Modifications	$1,105,000	*$552,500*	*$0*	**$552,500**	2010
39	Joshua Road and Cedar Grove Road	Install WB right-turn lane, and Traffic Signal Modifications	$109,000	*$54,500*	*$0*	**$54,500**	2010
43	North Lane and Hector Street	Install additional NB through lane, and Traffic Traffic Signal Modifications	$875,000	*$437,500*	*$0*	**$437,500**	2010
	Hector Street (North Lane to Cedar Grove)	Install additional through lane each direction	$1,170,000	*$585,000*	*$0*	**$585,000**	2010
		Totals	$7,710,000	$2,747,417	$1,004,000	**$3,958,583**	
			$12,560,000	*$4,636,667*	*$1,427,000*	*$6,496,333*	
				36.9%	*11.4%*	*51.7%*	

Table 21

Overall Study Intersections/Roadways

	Cost Allocations				
	PennDOT	**County**	**Township**	**Development**	**Total**
Existing Program	$645,166.67	$471,500.00	$1,283,333.33	$0.00	***$2,400,000.00***
Pass-Through Program	$4,432,750.00	$1,729,500.00	$6,235,750.00	$0.00	***$12,398,000.00***
Development Program	$4,636,666.67	$1,427,000.00	$0.00	$6,496,333.33	***$12,560,000.00***
	$9,714,583.33	***$3,628,000.00***	***$7,519,083.33***	***$6,496,333.33***	***$27,358,000.00***

Allocation	0.355091137	0.132612033	0.274840388	0.237456442
Cost of RSA	59955			
	TSA North	$2,537,750.00	0.39064344	0.09
	TSA South	$3,958,583.33	0.60935656	0.14
	Total	$6,496,333.33		

RESOLUTION #2006-8

A RESOLUTION OF THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA TO APPROVE THE ROADWAY SUFFICIENCY ANALYSIS PREPARED BY McMAHON ASSOCIATES

WHEREAS, Act 209 of 1990 (53 P.S. §10501-A et. seq.) together with all amendments thereto (collectively "**Act 209**"), authorizes qualifying municipalities to establish an impact fee for transportation capital improvements (the "**Transportation Impact Fee**") and establishes a procedure for the adoption of a Transportation Impact Fee;

WHEREAS, pursuant to Act 209, the Whitemarsh Township (the "**Township**") on August 19, 2004 the Board of Supervisors (the "**Board**") adopted Resolution No. 2004-25, authorizing the creation, imposition and collection of impact fees to fund transportation capital improvements;

WHEREAS, Whitemarsh Township has experienced considerable growth in development in recent years causing congestion and potentially unsafe conditions on its roads;

WHEREAS, Land use assumptions indicate that such development will continue and will place ever-increasing demands on the Township to provide transportation improvements which can not be supported solely by the Township's general funds;

WHEREAS, in accordance with the requirements of Act 209, the Board created a Traffic Impact Fee Advisory Committee (the "**Committee**") for the purposes of developing land use assumptions, preparing a roadway sufficiency analysis study and making recommendations to the Board as to the development of roadway improvements, capital improvements and impact fees;

WHEREAS, the Committee caused Schoor DePalma Engineers and Consultants ("**Schoor DePalma**") to prepare a Land Use Assumptions Report dated June 21, 2005 (the "**LUAR**"). The LUAR was approved by the Committee, forwarded to the Board and adopted by the Board on September 22, 2005 by Resolution 2005-14;

WHEREAS, the Committee has caused McMahon Associates, Inc. ('**McMahon**") to prepare a Roadway Sufficiency Analysis dated December, 2005 (the "**Roadway Sufficiency Analysis**"); and

WHEREAS, following careful review and consideration, the Committee has recommended that the Board approve the Roadway Sufficiency Analysis.

NOW THEREFORE, BE IT RESOLVED, and it is hereby resolved by the Whitemarsh Township Board of Supervisors that the Roadway Sufficiency Analysis, as prepared by McMahon Associates, Inc. for Whitemarsh Township and dated December 2005, is hereby approved as the Roadway Sufficiency Analysis for Whitemarsh Township.

RESOLVED, this 26th day of January, 2006.

RESOLUTION #2006-9

A RESOLUTION OF THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA TO APPROVE THE TRANSPORTATION CAPITAL IMPROVEMENTS PLAN PREPARED BY McMAHON ASSOCIATES

WHEREAS, Act 209 of 1990 (53 P.S. §10501-A et. seq.) together with all amendments thereto (collectively "**Act 209**"), authorizes qualifying municipalities to establish an impact fee for transportation capital improvements (the "**Transportation Impact Fee**") and establishes a procedure for the adoption of a Transportation Impact Fee;

WHEREAS, pursuant to Act 209, the Whitemarsh Township (the "**Township**") on August 19, 2004 the Board of Supervisors (the "**Board**") adopted Resolution No. 2004-25, authorizing the creation, imposition and collection of impact fees to fund transportation capital improvements;

WHEREAS, Whitemarsh Township has experienced considerable growth in development in recent years causing congestion and potentially unsafe conditions on its roads;

WHEREAS, Land use assumptions indicate that such development will continue and will place ever-increasing demands on the Township to provide transportation improvements which can not be supported solely by the Township's general funds;

WHEREAS, in accordance with the requirements of Act 209, the Board created a Traffic Impact Fee Advisory Committee (the "**Committee**") for the purposes of developing land use assumptions, preparing a roadway sufficiency analysis study and making recommendations to the Board as to the development of roadway improvements, capital improvements and impact fees;

WHEREAS, the Committee caused Schoor DePalma Engineers and Consultants ("**Schoor DePalma**") to prepare a Land Use Assumptions Report dated June 21, 2005 (the "**LUAR**"). The LUAR was approved by the Committee, forwarded to the Board and adopted by the Board on September 22, 2005 by Resolution 2005-14;

WHEREAS, the Committee has caused McMahon Associates, Inc. ('**McMahon**") to prepare a Roadway Sufficiency Analysis dated December, 2005 (the "**Roadway Sufficiency Analysis**"), which the Committee forwarded to the Board with a recommendation for approval;

WHEREAS, the Board, by Resolution 2006-8, dated January 26, 2006 approved the Roadway Sufficiency Analysis;

WHEREAS, the Committee has caused McMahon to prepare a Transportation Capital Improvements Plan dated December, 2005 (the "**Transportation Capital Improvements Plan**"); and

WHEREAS, following careful review and consideration, the Committee has recommended that the Board approve the Transportation Capital Improvements Plan.

NOW THEREFORE, BE IT RESOLVED, and it is hereby resolved by the Whitemarsh Township Board of Supervisors that the Transportation Capital Improvements Plan, as prepared by McMahon Associates, Inc. for Whitemarsh Township and dated December 2005, is hereby approved as the Transportation Capital Improvements Plan for Whitemarsh Township.

RESOLVED, this 26th day of January, 2006.