March 18, 2025
(Last Revised February 4, 2026)
TPD# BETI.00012

Springhouse Mixed Use Development

Transportation Impact Study

Lower Gwynedd Township, Montgomery County, PA

For Submission To:

Lower Gwynedd Township, Montgomery County, PA

Moving ***Forward Together***®

SPRINGHOUSE MIXED USE DEVELOPMENT TRANSPORTATION IMPACT STUDY

FOR SUBMISSION TO:

Lower Gwynedd Township, Montgomery County, PA

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March 18, 2025
(Last Revised February 4, 2026)

TPD # BETI.00012

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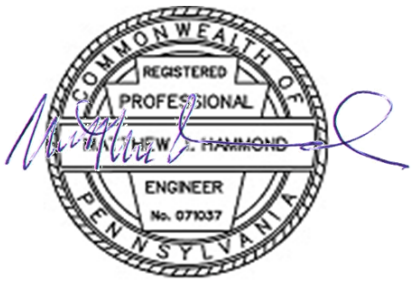

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EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed Springhouse Mixed-Use development on the roadway network in Lower Gwynedd Township, Montgomery County, PA. Based on this evaluation, the following conclusions were reached:

- The project site is located on the northwestern corner of Norristown Road (SR 2052) and Boveri Drive and currently consists of 143,295 sf of office space.
- The proposed site will be redeveloped and will consist of the following uses:
  - 77,619 sf of Office Space;
  - A 30,750 sf Grocery Store;
  - 16,000 sf of Retail Space;
  - 278 mid-rise apartments.
- Access to the Proposed Site will be provided via one (1) full-access signalized driveway via existing Boveri Drive. In addition, an emergency access will be provided in coordination with the Township Fire Marshal.
- All measured sight distances at the site driveway exceed the acceptable sight distances and, in most cases, exceed PennDOT's desirable sight distance requirements.
- Upon full build-out, the proposed development is expected to generate **311 new trips** during the weekday A.M. peak hour, **339 new trips** during the weekday P.M. peak hour, and **382 new trips** during the Saturday midday peak hour.
- The Existing Site (at full capacity) will generate **180 new trips** during the weekday AM peak hour, **173 new trips** during the weekday PM peak hour, and **126 new trips** during the Saturday Midday peak hour.
- When compared to the Existing Site (at full capacity), the **Proposed Site** will generate **131 more net new trips** during the weekday AM peak hour, **166 more net new trips** during the weekday PM peak hour, and **256 more net new trips** during the Saturday Midday peak hour**.**
- Under the 2027 and 2032 projected conditions, with the development of the proposed site, with site-related recommendations outline in **Table II,** all study area intersections will satisfy PennDOT ILOS Standards.
- Levels of Service (LOS) for the study area intersections have been summarized in matrix form. **Table I** details the overall intersection LOS for each study area intersection:

TABLE I
OVERALL INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Peak Hour	2024 Existing	Opening Year 2027			Design Year 2032[1] Without SHIP Development			Design Year 2032[2] With SHIP Development			Meets LOS Requirements?
			Base	Projected	Projected[3,4]	Base	Projected	Projected[3,4]	Base	Projected	Projected[3,4]	
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	Weekday A.M.	A (0.8)	A (0.8)	A (5.9)	A (5.9)	A (0.8)	A (5.9)	A (5.9)	A (0.8)	A (5.5)	A (5.5)	YES
	Weekday P.M.	A (1.2)	A (1.2)	A (8.1)	A (8.1)	A (1.2)	A (8.1)	A (8.1)	A (1.4)	A (8.2)	A (8.2)	
	Saturday	A (0.7)	A (0.7)	A (8.0)	A (8.0)	A (0.7)	A (8.0)	A (8.0)	A (0.7)	A (7.9)	A (7.9)	
Norristown Road (SR 2052) & Beech Hollow Road	Weekday A.M.	A (0.0)	A (0.0)	A (0.0)	--	A (0.0)	A (0.0)	--	A (0.0)	A (0.0)	--	YES
	Weekday P.M.	A (0.0)	A (0.0)	A (0.0)	--	A (0.0)	A (0.0)	--	A (0.1)	A (0.1)	--	
	Saturday	A (0.0)	A (0.0)	A (0.0)	--	A (0.0)	A (0.0)	--	A (0.0)	A (0.0)	--	
Norristown Road (SR 2052) & Route 309 NB Ramps	Weekday A.M.	C (31.3)	C (31.2)	C (30.1)	--	C (27.5)	C (26.7)	--	C (26.3)	C (26.8)	--	YES
	Weekday P.M.	B (17.8)	B (18.7)	B (18.4)	--	B (18.1)	B (17.8)	--	B (18.4)	B (18.6)	--	
	Saturday	C (21.2)	C (23.1)	C (21.4)	--	C (23.2)	C (21.4)	--	C (22.3)	C (20.7)	--	
Norristown Road (SR 2052) & Route 309 SB Ramps	Weekday A.M.	B (15.1)	B (15.5)	B (19.2)	--	B (15.8)	B (18.7)	--	B (19.6)	C (27.6)	--	YES
	Weekday P.M.	B (16.4)	B (16.9)	B (16.8)	--	B (17.3)	B (17.2)	--	B (19.4)	B (19.3)	--	
	Saturday	B (11.0)	B (10.8)	B (12.0)	--	B (11.0)	B (12.0)	--	B (11.4)	B (12.5)	--	
Norristown Road (SR 2052) & Tennis Avenue	Weekday A.M.	C (20.8)	C (21.4)	C (22.8)	--	C (20.8)	C (22.2)	--	C (26.9)	C (30.5)	--	YES
	Weekday P.M.	B (19.8)	B (19.8)	C (21.3)	--	C (20.3)	C (22.3)	--	C (23.6)	C (27.3)	--	
	Saturday	B (16.8)	B (16.7)	B (16.6)	--	B (16.5)	B (16.4)	--	B (17.2)	B (16.9)	--	
Norristown Road (SR 2052) & Residential Driveway/ SHIP Driveway	Weekday A.M.	A (2.2)	A (2.2)	A (2.2)	--	A (2.2)	A (2.2)	--	A (5.6)	A (5.8)	--	YES
	Weekday P.M.	A (3.5)	A (3.5)	A (3.4)	--	A (3.4)	A (3.4)	--	B (12.3)	B (12.6)	--	
	Saturday	A (2.0)	A (2.0)	A (2.0)	--	A (2.0)	A (2.0)	--	A (3.9)	A (3.9)	--	
Norristown Road (SR 2052) & McKean Road	Weekday A.M.	B (13.3)	B (13.5)	B (15.8)	--	B (13.7)	B (16.0)	--	B (13.4)	B (14.7)	--	YES
	Weekday P.M.	B (15.3)	B (15.0)	B (16.1)	--	B (15.2)	B (16.4)	--	B (17.1)	B (18.6)	--	
	Saturday	A (8.2)	A (8.2)	A (8.8)	--	A (8.3)	A (8.9)	--	A (8.8)	A (9.4)	--	
Norristown Road (SR 2052)/ Sumneytown Pike & Bethlehem Pike	Weekday A.M.	D (51.2)	D (40.4)	D (43.2)	--	D (40.9)	D (43.9)	--	D (49.2)	D (53.8)	--	YES
	Weekday P.M.	D (53.8)	D (47.1)	D (50.6)	--	D (45.2)	D (48.4)	--	D (45.8)	D (51.7)	--	
	Saturday	C (29.9)	C (29.8)	C (30.9)	--	C (29.9)	C (31.1)	--	C (30.3)	C (31.5)	--	

Base = No-Build scenario, Projected = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

» Site-related recommendations are summarized in **Table II**:

TABLE II
RECOMMENDATIONS

Intersection	Recommendation
Norristown Road (SR 2052) Corridor	Optimize traffic signals timings at the signalized study area intersections.
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	Restripe the Eastbound Left Turn Lane to increase the storage length to 250 feet.
	Extend the southbound Boveri Drive right turn lane, via widening, to the first internal intersection in order to accommodate future queue lengths.
	Work with the Township and PennDOT on potential traffic signal equipment upgrades.
	Work with the Township and PennDOT on potential traffic signal timing modifications to increase the green time on the westbound Norristown Road approach in order to create a gap in the eastbound traffic to facilitate turns in/out of Beech Hollow Road.
	Maintenance of on-site vegetation to maximize available sight distance.
Norristown Road (SR 2052) & Tennis Avenue (SR 2020)	Coordinate with the Township and PennDOT on shifting where the transition occurs between the one (1) westbound lane to two (2) westbound lanes further west in order to extend the existing eastbound left turn lane approaching Tennis Avenue.
Norristown Road Frontage	Provide a 10' wide trail beginning within the site and connecting to the existing trail located to the east of the site.
	Provide a 10' wide trail along the property's frontage.
	Provide sidewalk extending across the northbound Route 309 on-ramp, under Route 309, across the southbound Route 309 off-ramp and terminating at/near the SHIP property to the west of the site.
	Provide PennDOT compliant crosswalks and pedestrian traffic signal equipment at the existing signalized intersections between Boveri Drive and the Route 309 southbound off-ramp.

INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Revised Transportation Impact Study (TIS) for the proposed Springhouse Mixed-Use Development in Lower Gwynedd Township, Montgomery County, Pennsylvania. The project site is located on the northwestern corner of Norristown Road (SR 2052) and Boveri Drive, and consists of 143,295 sf of office space, as shown in **Figure 1**. As shown in **Figure 2**, the proposed site will consist of the following uses:

- 77,619 sf of Office Space;
- A 30,750 sf Grocery Store;
- 16,000 sf of Retail Space;
- 278 mid-rise apartments.

TPD assumed an opening year of 2027 and a design year of 2032. This report has been prepared in accordance with PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated September 2022. This TIS has been revised based on review comments contained in the Bowman review letter, dated June 26, 2025. Project Correspondence is contained in **Appendix A**.

EXISTING ROADWAY NETWORK

A field review of the existing roadway system in the study area was conducted. The existing roadway characteristics within the study area are summarized in **Table 1.** Photographs of the study area intersections are included in **Appendix B**.

TABLE 1
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	Functional Classification/ Roadway Type	Predominant Directional Orientation	Average Daily Traffic	Posted Speed Limit
Bethlehem Pike	State (SR 2018)	Minor Arterial	North-South	16,215	40 mph
Norristown Road	State (SR 2052)	Minor Arterial	East-West	19,169	45/40 mph
Tennis Avenue	State (SR 2020)	Urban Collector	North-South	5,277	40 mph
Route 309 NB Off Ramp	State (SR 8039)	Other Freeway	North	5,089	40 mph
Route 309 NB On Ramp	State (SR 8039)	Other Freeway	North	453	--
Route 309 SB Off Ramp	State (SR 8039)	Other Freeway	South	507	40 mph
Route 309 SB On Ramp	State (SR 8039)	Other Freeway	South	4,311	--
Sumneytown Pike	Other Principle Arterial Highway		East-West	14,748	35 mph
McKean Road	Urban Collector		North-South	2,981	35 mph
Boveri Drive	Local Road		North-South	--	25 mph
Beech Hollow Road	Local Road		North-South	--	--

Bicycle and Pedestrian Facilities

Based on observations during field visits at the study area intersections, there are no bicycle specific accommodations present. Pedestrian accommodations are detailed per intersection below.

- *Norristown Road (SR 2052) & Boveri Drive* – The signalized intersection does not have sidewalks. One (1) curb ramp exists on the NW corner serving one (1) crosswalk that crosses Norristown Road. Pedestrians are prohibited via signage from crossing the northern and eastern approaches.

- *Norristown Road (SR 2052) & Beech Hollow Road* – The unsignalized intersection does not have any pedestrian accommodations besides paved shoulders.
- *Norristown Road (SR 2052) & Route 309 NB Ramps* – The signalized intersection does not have any pedestrian accommodations besides paved shoulders. Pedestrians are prohibited via signage from crossing all approaches.
- *Norristown Road (SR 2052) & Route 309 SB Ramps* – The signalized intersection does not have any pedestrian accommodations besides paved shoulders. Pedestrians are prohibited via signage from crossing all approaches.
- *Norristown Road (SR 2052) & Tennis Avenue* – The signalized intersection has pedestrian curb ramps and crosswalks on all four approaches. There are pedestrian push buttons on the Norristown Road crossings.
- *Norristown Road (SR 2052) & Residential Driveway/SHIP Driveway* – The signalized intersection does not have any sidewalks or pedestrian curb ramps. There are crosswalks across Norristown Road with pedestrian push buttons.
- *Norristown Road (SR 2052) & McKean Road* – The signalized intersection has pedestrian curb ramps on the Northwestern, Northeastern, and Southeastern corners of the intersection. There are pedestrian push buttons and crosswalks on the southbound and westbound approaches, while pedestrians are prohibited via signage from crossing the Eastbound approach.
- *Norristown Road (SR 2052)/Sumneytown Pike & Bethlehem Pike (SR 2018)* – The signalized intersection has pedestrian curb ramps on all four corners of the intersection. There are pedestrian push buttons and crosswalks on all approaches.

Mass Transit Facilities

Montgomery County and the Lower Gwynedd area are provided with public transportation by SEPTA. Public transportation is not currently available in the vicinity of the proposed site.

Crash Data Investigation

Crash data were obtained from PennDOT for the study area intersections. PennDOT defines a reportable crash as follows, "A reportable (crash) is one in which an injury or fatality occurs or if at least one of the vehicles involved requires towing from the scene." Reportable crashes were tabulated for the five-year time period beginning 01/01/2019 and ending 12/31/2023. For a given intersection, PennDOT considers a crash occurrence of 5 reportable, correctable crashes over a continuous twelve-month period during the past five years to be a threshold value, above which the intersection design should be reviewed to examine if corrective measures can be taken to enhance safety. The number of reportable crashes at the study area intersections is shown in **Table 2.**

TABLE 2
PENNDOT REPORTABLE CRASH DATA

Study Area Intersection	Number of Reportable Crashes				
	2019	2020	2021	2022	2023
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	0	0	0	0	0
Norristown Road (SR 2052) & Beech Hollow Road	0	0	0	0	0
Norristown Road (SR 2052) & Route 309 NB Ramps	4	1	2	5	0
Norristown Road (SR 2052) & Route 309 SB Ramps	0	0	0	0	0
Norristown Road (SR 2052) & Tennis Avenue	1	2	1	1	1
Norristown Road (SR 2052) & Residential Driveway/SHIP Driveway	1	2	1	2	2
Norristown Road (SR 2052) & McKean Road	4	2	3	2	4
Norristown Road/Sumneytown Pike & Bethlehem Pike (SR 2018)	4	1	2	4	4

Based on a review of the crash data, there were no continuous twelve-month periods during the past five years where 5 or more crashes occurred that were deemed correctable, except for the following intersection:

» Norristown Road (SR 2052) & Route 309 NB Ramps – There were 5 or more reportable crashes that occurred in 2022. The primary types of crash were the angle and rear-end crashes. The primary causation of the crashes was due to driver error such as improper/careless turn, driving too fast for conditions, and running red light.

EXISTING TRAFFIC CONDITIONS

Manual Turning Movement Counts

Manual traffic counts were conducted on 15-minute intervals during the weekday morning (6:00 to 10:00 A.M.), weekday evening (3:00 to 7:00 P.M.) and Saturday midday (10:00 A.M. to 2:00 P.M.) peak periods. Data pertaining to heavy vehicles, pedestrians and transit vehicles were observed during the turning movement counts. Peak hours and count dates for the study area intersections are identified in **Table 3**.

TABLE 3
TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour[1]
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	Thursday, October 24, 2024	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	3:00 to 4:00 P.M.
	Saturday, October 26, 2024	Saturday Midday	12:15 to 1:15 P.M.
Norristown Road (SR 2052) & Beech Hollow Road	Thursday, October 24, 2024	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	3:00 to 4:00 P.M.
	Saturday, October 26, 2024	Saturday Midday	12:15 to 1:15 P.M.
Norristown Road (SR 2052) & Route 309 NB Ramps	Thursday, October 24, 2024	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	3:00 to 4:00 P.M.
	Saturday, October 26, 2024	Saturday Midday	12:30 to 1:30 P.M.
Norristown Road (SR 2052) & Route 309 SB Ramps	Thursday, October 24, 2024	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
	Saturday, October 26, 2024	Saturday Midday	1:00 to 2:00 P.M.
Norristown Road (SR 2052) & Tennis Avenue	Thursday, October 24, 2024	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	3:00 to 4:00 P.M.
	Saturday, October 26, 2024	Saturday Midday	12:00 to 1:00 P.M.
Norristown Road (SR 2052) & Residential Driveway/SHIP Driveway	Thursday, October 24, 2024	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
	Saturday, October 26, 2024	Saturday Midday	12:30 to 1:30 P.M.
Norristown Road (SR 2052) & McKean Road	Thursday, February 13, 2025	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
	Saturday, February 15, 2025	Saturday Midday	11:30 A.M. to 12:30 P.M.
Norristown Road/Sumneytown Pike & Bethlehem Pike	Thursday, February 13, 2025	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	4:30 to 5:30 P.M.
	Saturday, February 15, 2025	Saturday Midday	12:15 to 1:15 P.M.

Peak Hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.

Existing condition traffic volumes for the weekday A.M., weekday P.M., and Saturday peak hours are illustrated in **Figures 3-5**, respectively. Traffic count data sheets are provided in **Appendix C**.

BASE (NO-BUILD) CONDITIONS

Annual Background Growth

A background growth factor for the roadways in the study area was developed based on growth factors for August 2024 to July 2025 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.17% per year in Montgomery County for urban non-interstate roadways. Also, existing counts contained in this TIS were conducted in both 2024 and 2025. As such, the background growth factor was applied annually to yield overall growth percentages of 0.34%-0.51% (0.17% per year, compounded over 2-3 years) for the 2027 opening year and 1.2%-1.37% (0.17% per year, compounded over 7-8 years) for the 2032 design year.

Nearby Proposed Developments

Base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the opening year (2027) and design year (2032) of the proposed development. Based on discussions with Lower Gwynedd Township staff, the following nearby planned development was specifically included in this study:

SHIP Development - The project site is located on the northeastern corner of Norristown Road (S.R. 2007) and McKean Road. The Proposed Site will be a redevelopment of the former Rohm and Haas campus and

will consist of the following uses: 80,606 ksf Manufacturing and 598.161 ksf of Research and Development. TPD based trip generation and distribution on previous Traffic Impact Studies (TIS) conducted for this site. The latest TIS called for the following roadway improvements as a result of the development:

- Norristown Road (S.R. 2007) & McKean Road
  - 350' EB left-turn lane
- Norristown Road (S.R. 2007) & SHIP Driveway/Springhouse Estates
  - 250' EB left-turn lane
  - 225' WB right-turn lane

Based on the current schedule for this site and the Proposed Site, TPD included the traffic associated with this development under 2032 Design Year Conditions only. The site-related improvements listed above were included under 2032 Base and 2032 Projected Conditions. ***In addition, as requested by Township Consultants in their review, 2032 Base and 2032 Projected Conditions have been analyzed with and without the traffic and roadway improvements associated with this development.***

Additionally, through further coordination with Lower Gwynedd Township, the proposed developments of Ambler Yards, Maple Glen Townhomes and Promenade East in Upper Dublin were mentioned. However, it is TPD's opinion that due to their proximity to the site, any traffic associated with these developments would be captured in the annual background growth rates applied.

The additional traffic volumes due to background growth and background developments (as relevant) were added to the existing traffic data to produce 2027 and 2032 base (no-build) condition traffic volumes (with and without SHIP Development traffic and improvements). Base condition volumes for the weekday A.M., weekday P.M. and Saturday midday peak hours are illustrated in **Figures 6-8** for the 2027 opening year conditions and **Figures 9-14** for the 2032 design year conditions (with and without SHIP Development traffic and improvements). Trip distributions for background developments are provided in **Appendix D**.

SCHEDULED ROADWAY IMPROVEMENTS

Based on a review of the Pennsylvania and DVRPC Transportation Improvement Programs (TIP) there are no programmed roadway improvements in the vicinity of the proposed site.

As stated above, the nearby planned SHIP Development includes several roadway improvements in the Study Area. Design Year (2032 Base and Projected) Conditions are assumed with and without SHIP Development traffic and improvements.

PROPOSED SITE ACCESS

The proposed site will be served by one (1) full-movement signalized driveway to Norristown Road (SR 2052), via existing Boveri Drive. In addition, an emergency access will be provided in coordination with the Township Fire Marshal.

Sight Distance Analysis

A sight distance analysis was prepared for the proposed site driveway. In general, recommended safe sight distances depend upon the posted speed limit and roadway grades. The existing sight distances at the proposed driveways were measured in accordance with PennDOT Publication 282 Highway Occupancy Permit Operations Manual and compared to PennDOT's desirable sight distance standard, which is identified in 67 PA Code Chapter 441.8(h), "Access to and Occupancy of Highways by Driveways and Local Roads." In addition,

measured sight distances at the proposed driveways were compared to PennDOT's safe stopping sight distance standard, which is calculated by the following equation:

$$SSSD = 1.47VT + V^2/[30(f \pm g)]$$

SSSD = safe stopping sight distance (acceptable sight distance)
V = Vehicle Speed
T = Perception Reaction Time of Driver (2.5 seconds)
f = Coefficient of Friction for Wet Pavements
g = Percent of Roadway Grade Divided by 100

Table 4 shows the measured, desirable, acceptable (SSSD) sight distances at the site driveway for vehicles entering and exiting the site.

TABLE 4
SIGHT DISTANCE ANALYSIS

	Direction	Speed	Grade[1]	Sight Distances (feet)		
				DES	SSSD	EXIST[2]
Site Driveway (Boveri Drive) to Norristown Road (SR 2052)						
Exiting Movements	To the left	45 mph	-1%	635′	390′	**650′+**
	To the right	45 mph	-1%	570′	390′	**450′**
Entering Left Turns	Approaching same direction	45 mph	-1%	N/A	390′	**600′+**
	Approaching opposite direction	45 mph	-1%	445′	390′	**650′+**

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance
EXIST = Existing (measured) Sight Distance
1 = Roadway Grade Approaching Driveway
2 = With removal of vegetation

As shown in **Table 4** above, all measured sight distances at the signalized site driveway exceed the acceptable sight distances and, in most cases, exceed PennDOT's desirable sight distance requirements.

TRIP GENERATION

The trip generation rates for the Proposed Site were obtained from the Trip Generation Manual, Twelfth Edition, 2025, an institute of Transportation Engineers (ITE) Informational Report. Land Use Code #221 (Multifamily Housing (Mid-Rise) – Not Close to Rail Transit), #710 (General Office), #821 (Shopping Plaza (40-150K) - with Supermarket) was used to calculate the number of vehicular trips generated during the following time periods: average weekday; weekday A.M. peak hour, weekday P.M. peak hour and Saturday Midday peak hour.

Table 5 shows the rates and directional percentages for the analyzed time periods.

TABLE 5
ITE TRIP GENERATION DATA

Land Use	ITE #	Units	Time Period	Equations/Rates	Entering %	Pass-By %
Multifamily Housing (Mid-Rise) (Not Close to Rail Transit)	221	278 du	Average Weekday	T = 4.55*(X) – 17.52	50%	--
			Weekday A.M. Peak Hour	T = 0.42*(X) – 7.77	23%	--
			Weekday P.M. Peak Hour	T = 0.38*(X)	64%	--
			Saturday Midday Peak Hour	T = 0.36*(X)	51%	--
General Office	710	77.619 ksf	Average Weekday	T = 6.18*(X) + 207.96	50%	--
			Weekday A.M. Peak Hour	T = 1.12*(X) + 19.95	88%	--
			Weekday P.M. Peak Hour	T = 0.99*(X) + 31.14	16%	--
			Saturday Midday Peak Hour	T = 0.88*(X)	54%	--
Shopping Plaza (40-150K) - with Supermarket	821	46.750 ksf	Average Weekday	T = 101.43*(X)	50%	--
			Weekday A.M. Peak Hour	T = 3.54*(X)	60%	30%[1]
			Weekday P.M. Peak Hour	T = 8.58*(X)	49%	40%
			Saturday Midday Peak Hour	T = 5.46*(X) + 168.21	49%	31%

T = number of site-generated vehicular trips
X = independent variable (ksf = 1000 sf, du= Dwelling Units)
1 = Data not published, used 10% less than PM Peak Hour

Internal Trips

TPD assumed interaction between the individual uses for the Proposed (Future Build) scenario utilizing the methodology outlined in the NHCRP Report 684. Based on this methodology, the following overall weighted interaction percentages were calculated:

- Average Weekday – 16.1% (weighted average based on AM and PM, by land use)
- Weekday AM Peak Hour – 6.3%
- Weekday PM Peak Hour – 23.1%
- SAT Midday Peak Hour – 16.2% (weighted average based on AM and PM, by land use, by enter and exit)

The interaction worksheets are included in **Appendix E** and are summarized in **Table 6**. ***As requested, descriptions of the interaction calculations for the Average Weekday and Saturday Midday are also included in Appendix E.***

TABLE 6
TRIP GENERATION SUMMARY

Land Use	Total Trips			Interaction			Pass-By Trips			New Trips		
	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Average Weekday												
Multifamily Housing (Mid-Rise)	1247	624	623	-320	-160	-160	--	--	--	927	464	463
General Office	688	344	344	-110	-55	-55	--	--	--	578	289	289
Shopping Plaza (40-150K)	4742	2371	2371	-646	-323	-323	--	--	--	4096	2048	2048
Total	***6677***	***3339***	***3338***	***-1076***	***-538***	***-538***	***--***	***--***	***--***	***5601***	***2801***	***2800***
Weekday A.M. Peak Hour												
Multifamily Housing (Mid-Rise)	109	25	84	-4	-1	-3	0	0	0	105	24	81
General Office	107	94	13	-10	-6	-4	0	0	0	97	88	9
Shopping Plaza (40-150K)	165	99	66	-10	-5	-5	46	28	18	109	66	43
Total	***381***	***218***	***163***	***-24***	***-12***	***-12***	***46***	***28***	***18***	***311***	***178***	***133***
Weekday P.M. Peak Hour												
Multifamily Housing (Mid-Rise)	106	68	38	-51	-33	-18	0	0	0	55	35	20
General Office	108	17	91	-24	-6	-18	0	0	0	84	11	73
Shopping Plaza (40-150K)	401	197	204	-67	-32	-35	134	66	68	200	99	101
Total	***615***	***282***	***333***	***-142***	***-71***	***-71***	***134***	***66***	***68***	***339***	***145***	***194***
Saturday Midday Peak Hour												
Multifamily Housing (Mid-Rise)	100	51	49	-27	-19	-8	0	0	0	73	32	41
General Office	68	37	31	-11	-4	-7	0	0	0	57	33	24
Shopping Plaza (40-150K)	423	207	216	-58	-26	-32	113	56	57	252	125	127
Total	***591***	***295***	***296***	***-96***	***-49***	***-47***	***113***	***56***	***57***	***382***	***190***	***192***

Based on Table 6, the Proposed Site will generate 311 new trips during the weekday AM peak hour, 339 new trips during the weekday PM peak hour, and 382 new trips during the Saturday Midday peak hour.

Trip Generation Comparison

It is TPD's understanding the Existing Site consists of 143,295 sf of general office space. Based on the trip generation data contained in **Table 5** (ITE #710), the Existing Site (at full capacity) would generate **180 new trips** during the weekday AM peak hour, **173 new trips** during the weekday PM peak hour, and **126 new trips** during the Saturday Midday peak hour. Therefore, when compared to the Existing Site (at full capacity), the **Proposed Site** will generate **131 more net new trips** during the weekday AM peak hour, **166 more net new trips** during the weekday PM peak hour, and **256 more net new trips** during the Saturday Midday peak hour.

Trip Generation Credit

In order to account for the traffic associated with the Existing Site (at current capacity) being replaced by the traffic associated with the Proposed Site (at full capacity), TPD developed a base condition redistribution based on the counts performed at Norristown Road (S.R. 2052) and Boveri Drive, which will zero-out the current trip generation. This base redistribution is shown in **Figures 15-17**.

TRIP DISTRIBUTION

The distribution of trips generated by the proposed development was based on the local road network, the existing traffic patterns, the proposed use of the site, and the site driveway location. The new trips for the proposed development were distributed to the local roadway network based on the percentages shown in **Table 7**.

TABLE 7
TRIP DISTRIBUTION PERCENTAGES – NEW TRIPS

Direction - To/From	Assignment (To/From)	Distribution Percentage
West	via Sumneytown Pike	20%
South	via Bethlehem Pike	17%
South	via Route 309 NB	16%
North	via Bethlehem Pike	13%
East	via Norristown Road	12%
South	via Tennis Avenue	7%
North	via Tennis Avenue	7%
North	via McKean Road	6%
North	via Route 309 SB	2%

Pass-By Trips

Pass-by trips were established based on the existing traffic patterns in the vicinity of the site and the location and configuration of the site driveway. The percentages used for the distribution of pass-by trips to the project site are shown below in **Table 8**.

TABLE 8
TRIP DISTRIBUTION PERCENTAGES – PASS-BY TRIPS

Direction	Pass-by Trip Distribution Percentages		
	Weekday A.M.	Weekday P.M.	Saturday Midday
EB via Norristown Road	53%	65%	50%
WB via Norristown Road	47%	35%	50%

The assignment of site-generated trips for the proposed developments during the weekday A.M., P.M., and Saturday midday peak hours are shown in **Figures 18-20**. The trip distribution and assignment percentage information are included in **Appendix F**. ***It should be noted that, in order to comply with a review comment from the Township Traffic Engineer (pertaining to pass-by trips balancing), TPD conservatively increased the respective lower enter or exit pass-by trip numbers during each peak hour to be equal with the higher enter or exit pass-by trip numbers. This is reflected in the volume development spreadsheet and figures.***

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2027 and respective 2032 base (no-build) condition traffic volumes to develop the 2027 and 2032 projected (build) (with and without SHIP Development traffic and improvements) condition traffic volumes. Projected condition traffic volumes for the opening year of 2027 for the weekday A.M., P.M., and Saturday midday peak hours are shown in **Figures 21-23**. Projected condition traffic volumes for the design year of 2032 (with and without SHIP Development traffic and improvements) for the weekday A.M., P.M., and Saturday midday peak hours are shown in **Figures 24-29.** Traffic volume development worksheets are also contained in **Appendix F**.

LEVELS OF SERVICE FOR AN INTERSECTION

For analysis of intersections, level of service is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS criteria is stated in terms of control delay per vehicle

for a one-hour analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The criteria are shown in **Table 9**. Delay, as it relates to level of service, is a complex measure and is dependent upon a number of variables. For signalized intersections, these variables include the quality of vehicle progression, the cycle length, the green time ratio, and the volume/capacity ratio for the lane group in question. For unsignalized intersections, delay is related to the availability of gaps in the flow of traffic on the major street and the driver's discretion in selecting an appropriate gap for a particular movement from the minor street (straight across, left or right turn).

TABLE 9
LEVEL OF SERVICE CRITERIA
UNSIGNALIZED AND SIGNALIZED INTERSECTIONS[1]

Level of Service	Control Delay Per Vehicle (Seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10 and < 20	> 10 and < 15
C	> 20 and < 35	> 15 and < 25
D	> 35 and < 55	> 25 and < 35
E	> 55 and < 80	> 35 and < 50
F	> 80 or v/c > 1.0	> 50 or v/c > 1.0

[1] Obtained from Exhibits 19-8 and 20-2 of the Transportation Research Board's Highway Capacity Manual 6th Edition

CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted for the weekday A.M., P.M., and Saturday midday peak hours at the study area intersections. These analyses were conducted according to the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM) using *Synchro 12* software, a Trafficware product.

The following conditions were analyzed, as applicable:

- Existing conditions;
- 2027 Base conditions (Build-out year without development);
- 2027 Projected conditions (Build-out year with development);
- 2032 Base conditions (Design year without development) – Without SHIP Traffic/Improvements;
- 2032 Projected conditions (Design year with development) – Without SHIP Traffic/Improvements;
- 2032 Base conditions (Design year without development) – With SHIP Traffic/Improvements;
- 2032 Projected conditions (Design year with development) – With SHIP Traffic/Improvements.

It should be noted that based on methodologies contained in Chapter 10 of PennDOT's Publication 46, TPD adjusted the following 2010 HCM default values in the *Synchro 12* capacity analysis. These adjustments were made at the signalized intersections within the study area for all time periods based on the study area location being classified as Suburban:

- Base saturation flow rates for signalized intersections. The saturation flow rate was changed from the default value of 1900 to 1800 based on Exhibit 10-9.

- Start-up lost time and extension of effective green time for signalized intersections. The startup lost time was changed from the default value of 2.0 seconds to 2.5 seconds. Based on the total clearance time (yellow plus all-red time) being greater than 5 seconds, the extension of green time

was changed from the default value of 2 seconds to 3.5 seconds. These adjusted values were based on Exhibit 10-10.

- Critical and Follow-Up Gap times were adjusted relative to the difference between default and PA Default values contained in Exhibits 10-11 and 10-12. As requested by PennDOT, worksheets/tables showing how these values were calculated are included in **Appendix G**.
- Due to limitations of the HCM methodology to analyze clustered intersections, the signalized intersections of Norristown Road (SR 2052) and Route 309 Ramps have been analyzed with the synchro percentile methodology.
- Due to limitations of the HCM methodology to analyze intersections which have protected left turn movements from a shared left-thru lane, the signalized intersection of Norristown Road (SR 2052) and Tennis Avenue (SR 2020) has been analyzed with the synchro percentile methodology.
- Due to limitations of the HCM methodology to analyze intersections which have protected left turn movements from a shared left-thru lane, the signalized intersection of Norristown Road (SR 2052) and McKean Road has been analyzed with the synchro percentile methodology.

In addition, capacity analyses were conducted at the proposed site driveway intersection under the 2027 and 2032 projected conditions. The capacity analysis worksheets are included in **Appendix H**. The PennDOT-approved signal plans are included in **Appendix I**.

PennDOT's Transportation Impact Study Guidelines outlined in PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated September 2022 contain the following criteria regarding levels of service:

- Page 29 of the Guidelines state that if evaluation of the With Development Horizon Year Scenario to the Without Development Horizon Year Scenario indicates that the overall intersection level of service has dropped, the applicant will be required to mitigate the level of service if the increase in overall intersection delay is greater than 10-seconds. If the overall intersection delay increase is less than or equal to 10-seconds, mitigation of the intersection will not be required.
- Page 29 of the Guidelines state that for mitigation scenarios, applicants are expected to mitigate the overall intersection LOS to the original Without Development LOS; the 10-second delay variance is not applied to mitigation scenarios. Applicants may be required to address available storage and queue lengths at critical movements or approaches even if the overall LOS requirements are met.
- Page 31 of the Guidelines state that if signalization is the preferred alternative for mitigation, overall intersection LOS C in rural areas and LOS D in urban areas is acceptable.
- Page 31 of the Guidelines states new signalized or unsignalized intersection established to serve as access to the development shall be designed to operate at minimum LOS C for rural areas, and minimum LOS D for urban areas.

LEVELS OF SERVICE IN THE STUDY AREA

Level of service (LOS) matrices for the study area intersections are shown in **Tables 10-12** for the weekday A.M., weekday P.M., and Saturday midday peak hours.

TABLE 10
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour									
		Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
			Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & Boveri Drive/ Site Driveway	EB L	A	A	A	A	A	A	A	A	A	A
	EB T	A	A	A	A	A	A	A	A	A	A
	WB T	A	A	A	A	A	A	A	A	A	A
	WB TR	A	A	A	A	A	A	A	A	A	A
	SB L	D	D	D	D	D	D	D	D	D	D
	SB R	D	D	D	D	D	D	D	D	D	D
	ILOS	**A (0.8)**	**A (0.8)**	**A (5.9)**	**A (5.9)**	**A (0.8)**	**A (5.9)**	**A (5.9)**	**A (0.8)**	**A (5.5)**	**A (5.5)**
Norristown Road (SR 2052) & Beech Hollow Road	WB LT	A	A	A	--	A	A	--	A	A	--
	NB LR	A	A	A	--	A	A	--	A	A	--
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	--	**A (0.0)**	**A (0.0)**	--	**A (0.0)**	**A (0.0)**	--
Norristown Road (SR 2052) & Route 309 NB Ramps	EB L	B	B	B	--	B	B	--	B	B	--
	EB T	A	A	A	--	A	A	--	A	A	--
	WB TR	C	C	C	--	C	C	--	C	C	--
	NB L	E	E	E	--	D	D	--	D	D	--
	NB LT	E	E	E	--	D	D	--	D	D	--
	NB R	A	A	A	--	A	A	--	A	A	--
	ILOS	**C (31.3)**	**C (31.2)**	**C (30.1)**	--	**C (27.5)**	**C (26.7)**	--	**C (26.3)**	**C (26.8)**	--
Norristown Road (SR 2052) & Route 309 SB Ramps	EB T	C	C	C	--	C	C	--	C	D	--
	EB R	B	B	B	--	B	B	--	B	B	--
	WB L	D	D	D	--	D	D	--	D	D	--
	WB T	A	A	B	--	A	A	--	B	C	--
	SB L	C	C	C	--	C	C	--	C	C	--
	SB R	A	A	A	--	A	A	--	A	A	--
	ILOS	**B (15.1)**	**B (15.5)**	**B (19.2)**	--	**B (15.8)**	**B (18.7)**	--	**B (19.6)**	**C (27.6)**	--
Norristown Road (SR 2052) & Tennis Avenue	EB L	B	B	C	--	C	C	--	D	E	--
	EB TR	A	A	B	--	A	B	--	B	B	--
	WB L	B	B	B	--	B	B	--	B	B	--
	WB TR	C	C	C	--	C	C	--	D	D	--
	NB LT	C	C	C	--	C	C	--	C	C	--
	NB R	A	A	A	--	A	A	--	A	A	--
	SB LTR	C	C	C	--	C	C	--	C	C	--
	ILOS	**C (20.8)**	**C (21.4)**	**C (22.8)**	--	**C (20.8)**	**C (22.2)**	--	**C (26.9)**	**C (30.5)**	--
Norristown Road (SR 2052) & Residential Driveway/ SHIP Driveway	EB L	A	A	A	--	A	A	--	B	B	--
	EB T							--	A	A	--
	EB TR	A	A	A	--	A	A	--	A	A	--
	WB LT	A	A	A	--	A	A	--	A	A	--
	WB T	A	A	A	--	A	A	--	A	A	--
	WB R							--	A	A	--
	NB L	D	D	D	--	D	D	--	D	D	--
	NB TR	D	D	D	--	D	D	--	D	D	--
	SB L	D	D	D	--	D	D	--	D	D	--
	SB TR	D	D	D	--	D	D	--	D	D	--
	ILOS	**A (2.2)**	**A (2.2)**	**A (2.2)**	--	**A (2.2)**	**A (2.2)**	--	**A (5.6)**	**A (5.8)**	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

TABLE 10 (CONTINUED)
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour									
		Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
			Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & McKean Road	EB L	B	B	B	--	B	B	--	A	B	--
	EB T								A	A	--
	WB T	B	B	B	--	B	B	--	B	C	--
	WB R	A	A	A	--	A	A	--	A	A	--
	NB LTR	A	A	A	--	A	A	--	A	A	--
	SB L	D	D	D	--	D	D	--	D	D	--
	SB R	B	B	B	--	B	C	--	B	B	--
	ILOS	**B (13.3)**	**B (13.5)**	**B (15.8)**	--	**B (13.7)**	**B (16.0)**	--	**B (13.4)**	**B (14.7)**	--
Norristown Road (SR 2052) /Sumneytown Pike & Bethlehem Pike	EB L	C	C	C	--	C	C	--	C	C	--
	EB T	F (97.7)	E	E	--	E	E	--	F (87.7)	F (99.6)	--
	EB R	C	C	C	--	C	C	--	C	C	--
	WB L	D	D	D	--	D	D	--	D	E	--
	WB T	D	D	D	--	D	D	--	D	D	--
	WB TR	D	D	D	--	D	D	--	D	D	--
	NB L	C	C	C	--	C	C	--	C	C	--
	NB T	C	C	C	--	C	C	--	C	D	--
	NB TR	C	C	C	--	C	C	--	D	D	--
	SB L	C	C	C	--	C	C	--	C	C	--
	SB T	C	C	C	--	C	C	--	C	C	--
	SB TR	A	A	A	--	A	A	--	A	A	--
	ILOS	**D (51.2)**	**D (40.4)**	**D (43.2)**	--	**D (40.9)**	**D (43.9)**	--	**D (49.2)**	**D (53.8)**	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

TABLE 11
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday P.M. Peak Hour									
		Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
			Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & Boveri Drive/ Site Driveway	EB L	A	A	A	A	A	A	A	A	A	A
	EB T	A	A	A	A	A	A	A	A	A	A
	WB T	A	A	A	A	A	A	A	A	A	A
	WB TR	A	A	A	A	A	A	A	A	A	A
	SB L	D	D	D	D	D	D	D	D	D	D
	SB R	A	A	D	D	A	D	D	A	D	D
	ILOS	**A (1.2)**	**A (1.2)**	**A (8.1)**	**A (8.1)**	**A (1.2)**	**A (8.1)**	**A (8.1)**	**A (1.4)**	**A (8.2)**	**A (8.2)**
Norristown Road (SR 2052) & Beech Hollow Road	WB LT	B	B	B	--	B	B	--	B	B	--
	NB LR	C	C	C	--	C	C	--	D	E	--
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	--	**A (0.0)**	**A (0.0)**	--	**A (0.1)**	**A (0.1)**	--
Norristown Road (SR 2052) & Route 309 NB Ramps	EB L	C	C	C	--	C	C	--	C	C	--
	EB T	A	A	A	--	A	A	--	A	A	--
	WB TR	B	B	B	--	B	B	--	B	B	--
	NB L	D	D	D	--	D	D	--	D	D	--
	NB LT	D	D	D	--	D	D	--	D	D	--
	NB R	B	B	B	--	B	B	--	B	B	--
	ILOS	**B (17.8)**	**B (18.7)**	**B (18.4)**	--	**B (18.1)**	**B (17.8)**	--	**B (18.4)**	**B (18.6)**	--
Norristown Road (SR 2052) & Route 309 SB Ramps	EB T	C	C	C	--	C	C	--	C	C	--
	EB R	C	C	C	--	C	C	--	C	C	--
	WB L	D	D	D	--	D	D	--	D	D	--
	WB T	A	A	A	--	A	A	--	A	A	--
	SB L	C	C	C	--	C	C	--	C	C	--
	SB R	A	A	A	--	A	A	--	A	A	--
	ILOS	**B (16.4)**	**B (16.9)**	**B (16.8)**	--	**B (17.3)**	**B (17.2)**	--	**B (19.4)**	**B (19.3)**	--
Norristown Road (SR 2052) & Tennis Avenue	EB L	A	A	B	--	A	B	--	C	D	--
	EB TR	B	B	B	--	B	B	--	B	C	--
	WB L	B	B	B	--	B	B	--	B	B	--
	WB TR	C	C	C	--	C	C	--	C	D	--
	NB LT	D	D	D	--	D	D	--	D	D	--
	NB R	A	A	A	--	A	A	--	A	A	--
	SB LTR	C	C	C	--	C	C	--	C	C	--
	ILOS	**B (19.8)**	**B (19.8)**	**C (21.3)**	--	**C (20.3)**	**C (22.3)**	--	**C (23.6)**	**C (27.3)**	--
Norristown Road (SR 2052) & Residential Driveway/ SHIP Driveway	EB L	A	A	A	--	A	A	--	A	A	--
	EB T								A	A	--
	EB TR	A	A	A	--	A	A	--	A	A	--
	WB LT	A	A	A	--	A	A	--	A	B	--
	WB T	A	A	A	--	A	A	--	B	B	--
	WB R								A	A	--
	NB L	D	D	D	--	D	D	--	C	C	--
	NB TR	D	D	D	--	D	D	--	C	C	--
	SB L	D	D	D	--	D	D	--	D	D	--
	SB TR	D	D	D	--	D	D	--	C	C	--
	ILOS	**A (3.5)**	**A (3.5)**	**A (3.4)**	--	**A (3.4)**	**A (3.4)**	--	**B (12.3)**	**B (12.6)**	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

TABLE 11 (CONTINUED)
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday P.M. Peak Hour									
		Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
			Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & McKean Road	EB L	B	B	B	--	B	B	--	A	B	--
	EB T								A	A	--
	WB T	A	A	A	--	A	A	--	B	B	--
	WB R	A	A	A	--	A	A	--	A	A	--
	NB LTR	A	A	A	--	A	A	--	A	A	--
	SB L	E	E	E	--	E	E	--	E	E	--
	SB R	A	A	B	--	A	B	--	B	B	--
	ILOS	**B (15.3)**	**B (15.0)**	**B (16.1)**	--	**B (15.2)**	**B (16.4)**	--	**B (17.1)**	**B (18.6)**	--
Norristown Road (SR 2052) /Sumneytown Pike & Bethlehem Pike	EB L	D	D	D	--	C	C	--	C	C	--
	EB T	F (116.9)	F (88.2)	F (98.7)	--	F (79.4)	F (87.9)	--	E	E	--
	EB R	C	C	C	--	C	C	--	C	C	--
	WB L	D	D	D	--	D	D	--	E	F (95.0)	--
	WB T	D	D	D	--	D	D	--	D	D	--
	WB TR	D	D	D	--	D	D	--	D	D	--
	NB L	C	C	C	--	C	C	--	C	C	--
	NB T	C	C	C	--	C	C	--	D	D	--
	NB TR	C	C	C	--	C	D	--	D	D	--
	SB L	C	C	C	--	C	C	--	D	D	--
	SB T	C	C	C	--	C	C	--	D	D	--
	SB TR	A	A	A	--	A	A	--	A	A	--
	ILOS	**D (53.8)**	**D (47.1)**	**D (50.6)**	--	**D (45.2)**	**D (48.4)**	--	**D (45.8)**	**D (51.7)**	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

TABLE 12
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	SAT Midday Peak Hour									
		Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
			Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & Boveri Drive/ Site Driveway	EB L	A	A	A	A	A	A	A	A	A	A
	EB T	A	A	A	A	A	A	A	A	A	A
	WB T	A	A	A	A	A	A	A	A	A	A
	WB TR	A	A	A	A	A	A	A	A	A	A
	SB L	D	D	D	D	D	D	D	D	D	D
	SB R	A	A	D	D	A	D	D	A	D	D
	ILOS	**A (0.7)**	**A (0.7)**	**A (8.0)**	**A (8.0)**	**A (0.7)**	**A (8.0)**	**A (8.0)**	**A (0.7)**	**A (7.9)**	**A (7.9)**
Norristown Road (SR 2052) & Beech Hollow Road	WB LT	A	A	A	--	A	A	--	A	A	--
	NB LR	A	A	A	--	A	A	--	A	A	--
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	--	**A (0.0)**	**A (0.0)**	--	**A (0.0)**	**A (0.0)**	--
Norristown Road (SR 2052) & Route 309 NB Ramps	EB L	C	C	C	--	C	C	--	C	C	--
	EB T	A	A	A	--	A	A	--	A	A	--
	WB TR	C	C	C	--	C	C	--	C	C	--
	NB L	D	E	E	--	E	E	--	D	D	--
	NB LT	D	E	E	--	E	E	--	D	D	--
	NB R	A	A	B	--	B	B	--	A	A	--
	ILOS	**C (21.2)**	**C (23.1)**	**C (21.4)**	--	**C (23.2)**	**C (21.4)**	--	**C (22.3)**	**C (20.7)**	--
Norristown Road (SR 2052) & Route 309 SB Ramps	EB T	C	B	C	--	B	C	--	C	C	--
	EB R	A	A	A	--	A	A	--	A	A	--
	WB L	D	D	D	--	D	D	--	D	D	--
	WB T	A	A	A	--	A	A	--	A	A	--
	SB L	C	C	C	--	C	C	--	C	C	--
	SB R	A	A	A	--	A	A	--	A	A	--
	ILOS	**B (11.0)**	**B (10.8)**	**B (12.0)**	--	**B (11.0)**	**B (12.0)**	--	**B (11.4)**	**B (12.5)**	--
Norristown Road (SR 2052) & Tennis Avenue	EB L	A	A	A	--	A	A	--	A	A	--
	EB TR	A	A	A	--	A	A	--	A	A	--
	WB L	A	A	A	--	A	A	--	A	A	--
	WB TR	B	B	B	--	B	B	--	B	B	--
	NB LT	E	E	E	--	E	E	--	E	E	--
	NB R	A	A	A	--	A	A	--	A	A	--
	SB LTR	C	C	C	--	C	C	--	C	C	--
	ILOS	**B (16.8)**	**B (16.7)**	**B (16.6)**	--	**B (16.5)**	**B (16.4)**	--	**B (17.2)**	**B (16.9)**	--
Norristown Road (SR 2052) & Residential Driveway/ SHIP Driveway	EB L	A	A	A	--	A	A	--	A	A	--
	EB T								A	A	--
	EB TR	A	A	A	--	A	A	--	A	A	--
	WB LT	A	A	A	--	A	A	--	A	A	--
	WB T	A	A	A	--	A	A	--	A	A	--
	WB R								A	A	--
	NB L	D	D	D	--	D	D	--	D	D	--
	NB TR	D	D	D	--	D	D	--	D	D	--
	SB L	D	D	D	--	D	D	--	D	D	--
	SB TR	A	A	A	--	A	A	--	D	D	--
	ILOS	**A (2.0)**	**A (2.0)**	**A (2.0)**	--	**A (2.0)**	**A (2.0)**	--	**A (3.9)**	**A (3.9)**	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

TABLE 12 (CONTINUED)
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	SAT Midday Peak Hour									
		Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
			Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & McKean Road	EB L	A	A	A	--	A	A	--	A	A	--
	EB T								A	A	--
	WB T	A	A	A	--	A	A	--	B	B	--
	WB R	A	A	A	--	A	A	--	A	A	--
	NB LTR	A	A	A	--	A	A	--	A	A	--
	SB L	D	D	D	--	D	D	--	D	D	--
	SB R	A	A	A	--	A	A	--	A	A	--
	ILOS	**A (8.2)**	**A (8.2)**	**A (8.8)**	--	**A (8.3)**	**A (8.9)**	--	**A (8.8)**	**A (9.4)**	--
Norristown Road (SR 2052) /Sumneytown Pike & Bethlehem Pike	EB L	C	C	C	--	C	C	--	C	C	--
	EB T	D	D	D	--	D	D	--	D	D	--
	EB R	C	C	C	--	C	C	--	C	C	--
	WB L	C	C	C	--	C	C	--	C	C	--
	WB T	D	D	D	--	D	D	--	D	D	--
	WB TR	D	D	D	--	D	D	--	D	D	--
	NB L	B	B	B	--	B	B	--	B	B	--
	NB T	C	C	C	--	C	C	--	C	C	--
	NB TR	C	C	C	--	C	C	--	C	C	--
	SB L	B	B	B	--	B	B	--	B	C	--
	SB T	C	C	C	--	C	C	--	C	C	--
	SB TR	A	A	A	--	A	A	--	A	A	--
	ILOS	**C (29.9)**	**C (29.8)**	**C (30.9)**	--	**C (29.9)**	**C (31.1)**	--	**C (30.3)**	**C (31.5)**	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area

As shown in **Tables 10-12,** under all projected (build) conditions with the development of the proposed site and with site-related recommendations outlined in **Table 17**, all study area intersections will satisfy PennDOT ILOS Standards.

95TH PERCENTILE QUEUE ANALYSIS

Queue analyses were conducted at the study area intersections using *Synchro 12* software. For this analysis, the 95th percentile queue is defined as the queue length that is exceeded in 5% of the signal cycles. As an example, for a signal with a 90-second cycle, this means that the 95th percentile queue length will be exceeded during 2 of the 40 signal cycles that occur during the peak hour. The queue analysis results are summarized in **Table 13 - 15** for the analyzed peak hours.

TABLE 13
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement	Available Storage	Weekday A.M. Peak Hour									
			Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
				Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	EB L	150′	0′	0′	28′	28′	0′	28′	28′	0′	30′	30′
	EB T	575′[3]	3′	3′	53′	53′	3′	53′	53′	5′	58′	58′
	WB T	50′[3]	8′	8′	8′	8′	8′	8′	8′	10′	13′	13′
	WB TR	605′	8′	8′	8′	8′	8′	8′	8′	10′	13′	13′
	SB L	250′[5]	0′	0′	48′	48′	0′	48′	48′	0′	48′	48′
	SB R	250′[3]	3′	3′	123′	123′	3′	123′	123′	3′	123′	123′
Norristown Road (SR 2052) & Beech Hollow Road	WB LT	895′[3]	0′	0′	0′	--	0′	0′	--	0′	0′	--
	NB LR	335′[3]	0′	0′	0′	--	0′	0′	--	0′	0′	--
Norristown Road (SR 2052) & Route 309 NB Ramps	EB L	110′	6′	6′	4′	--	6′	4′	--	7′	5′	--
	EB T	160′[3]	36′	37′	56′	--	37′	54′	--	44′	61′	--
	WB TR	350′+	99′	108′	92′	--	110′	93′	--	143′	150′	--
	NB L	350′	407′	409′	409′	--	393′	393′	--	398′	398′	--
	NB LT	350′	408′	410′	410′	--	393′	393′	--	401′	401′	--
	NB R	140′	67′	69′	73′	--	64′	67′	--	62′	68′	--
Norristown Road (SR 2052) & Route 309 SB Ramps	EB T	580′[3]	119′	121′	147′	--	121′	146′	--	133′	157′	--
	EB R	60′	226′	243′	250′	--	241′	242′	--	268′	275′	--
	WB L	110′	72′	72′	81′	--	75′	82′	--	70′	74′	--
	WB T	160′[3]	39′	39′	41′	--	39′	45′	--	77′	98′	--
	SB L	50′	48′	48′	51′	--	50′	54′	--	53′	58′	--
	SB R	1000′+[3]	0′	0′	0′	--	0′	0′	--	0′	0′	--
Norristown Road (SR 2052) & Tennis Avenue	EB L	100′	118′	126′	171′	--	132′	121′	--	210′	243′	--
	EB TR	885′[3]	83′	85′	94′	--	82′	93′	--	83′	93′	--
	WB L	70′	62′	62′	64′	--	64′	64′	--	66′	66′	--
	WB TR	950′[3]	329′	365′	391′	--	328′	354′	--	400′	426′	--
	NB LT	430′[3]	111′	112′	120′	--	110′	120′	--	143′	156′	--
	NB R	35′	25′	25′	24′	--	25′	25′	--	24′	24′	--
	SB LTR	1000′+[3]	248′	251′	253′	--	247′	256′	--	308′	316′	--
Norristown Road (SR 2052) & Residential Driveway/SHIP Driveway	EB L	250′	10′	10′	10′	--	8′	8′	--	103′	118′	--
	EB T	865′[3]							--	55′	65′	--
	EB TR	865′[3]	8′	8′	8′	--	8′	8′	--	58′	68′	--
	WB LT	160′[3]	18′	18′	18′	--	18′	20′	--	88′	98′	--
	WB T	160′[3]	15′	15′	18′	--	15′	18′	--	70′	78′	--
	WB R	225′							--	15′	15′	--
	NB L	50′	8′	8′	8′	--	8′	8′	--	8′	8′	--
	NB TR	50′	3′	3′	3′	--	3′	3′	--	3′	3′	--
	SB L	35′	8′	8′	8′	--	8′	8′	--	58′	58′	--
	SB TR	365′[3]	0′	0′	0′	--	0′	0′	--	40′	40′	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area
5 = Distance to nearest public intersection

TABLE 13 (CONT'D)
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement	Available Storage	Weekday A.M. Peak Hour									
			Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
				Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & McKean Road	EB L	350′	211′	213′	268′	--	216′	276′	--	81′	92′	--
	EB T	1000′+[3]								235′	273′	--
	WB T	870′[3]	225′	227′	257′	--	229′	260′	--	330′	382′	--
	WB R	230′	32′	32′	33′	--	32′	33′	--	45′	48′	--
	NB LTR	--	0′	0′	0′	--	0′	0′	--	0′	0′	--
	SB L	70′	157′	158′	166′	--	159′	167′	--	164′	172′	--
	SB R	820′[3]	77′	81′	82′	--	81′	83′	--	69′	65′	--
Norristown Road (SR 2052) / Sumneytown Pike & Bethlehem Pike	EB L	100′	53′	50′	50′	--	50′	50′	--	50′	50′	--
	EB T	585′[3]	655′	535′	583′	--	545′	593′	--	690′	753′	--
	EB R	305′	215′	205′	205′	--	208′	208′	--	208′	208′	--
	WB L	600′+	150′	150′	183′	--	153′	188′	--	183′	228′	--
	WB T	1000′+[3]	405′	380′	403′	--	385′	408′	--	400′	428′	--
	WB TR	1000′+[3]	415′	390′	413′	--	395′	415′	--	410′	433′	--
	NB L	135′	168′	183′	188′	--	185′	190′	--	190′	190′	--
	NB T	340′[3]	183′	195′	215′	--	195′	218′	--	260′	280′	--
	NB TR	340′[3]	183′	195′	213′	--	195′	215′	--	250′	270′	--
	SB L	325′	73′	78′	98′	--	80′	100′	--	138′	158′	--
	SB T	512′[3]	203′	213′	213′	--	215′	215′	--	215′	215′	--
	SB TR	110′	0′	0′	0′	--	0′	0′	--	0′	0′	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area
5 = Distance to nearest public intersection

TABLE 14
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement	Available Storage	Weekday P.M. Peak Hour									
			Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
				Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	EB L	150′	0′	0′	45′	45′	0′	45′	45′	0′	48′	48′
	EB T	575′[5]	8′	10′	148′	148′	10′	148′	148′	13′	190′	190′
	WB T	50′[5]	5′	5′	10′	10′	5′	10′	10′	5′	10′	10′
	WB TR	605′	0′	0′	10′	10′	0′	10′	10′	0′	10′	10′
	SB L	250′[5]	3′	3′	108′	108′	3′	108′	108′	3′	108′	108′
	SB R	250′[5]	0′	0′	200′	200′	0′	200′	200′	0′	200′	200′
Norristown Road (SR 2052) & Beech Hollow Road	WB LT	895′[5]	0′	0′	0′	--	0′	0′	--	0′	0′	--
	NB LR	335′[5]	3′	3′	3′	--	3′	3′	--	3′	3′	--
Norristown Road (SR 2052) & Route 309 NB Ramps	EB L	110′	33′	33′	33′	--	33′	32′	--	36′	34′	--
	EB T	160′[5]	54′	52′	53′	--	55′	56′	--	58′	69′	--
	WB TR	350′+	47′	49′	84′	--	46′	82′	--	54′	89′	--
	NB L	350′	189′	209′	209′	--	192′	192′	--	213′	213′	--
	NB LT	350′	190′	210′	210′	--	194′	194′	--	214′	214′	--
	NB R	140′	64′	66′	84′	--	66′	84′	--	66′	84′	--
Norristown Road (SR 2052) & Route 309 SB Ramps	EB T	580′[5]	120′	119′	131′	--	124′	137′	--	145′	157′	--
	EB R	60′	516′	544′	552′	--	551′	557′	--	444′	445′	--
	WB L	110′	81′	79′	92′	--	81′	94′	--	80′	94′	--
	WB T	160′[5]	32′	33′	32′	--	32′	31′	--	33′	32′	--
	SB L	50′	38′	38′	40′	--	38′	40′	--	38′	40′	--
	SB R	1000′+[5]	0′	0′	0′	--	0′	0′	--	0′	0′	--
Norristown Road (SR 2052) & Tennis Avenue	EB L	100′	60′	67′	95′	--	76′	160′	--	288′	319′	--
	EB TR	885′[5]	401′	410′	436′	--	413′	456′	--	462′	491′	--
	WB L	70′	44′	45′	48′	--	45′	50′	--	49′	49′	--
	WB TR	950′[5]	325′	320′	345′	--	365′	392′	--	336′	384′	--
	NB LT	430′[5]	179′	177′	179′	--	182′	178′	--	178′	190′	--
	NB R	35′	25′	25′	23′	--	25′	23′	--	24′	24′	--
	SB LTR	1000′+[5]	180′	179′	177′	--	183′	175′	--	181′	188′	--
Norristown Road (SR 2052) & Residential Driveway/SHIP Driveway	EB L	250′	15′	15′	13′	--	13′	13′	--	13′	15′	--
	EB T	865′[5]								128′	138′	--
	EB TR	865′[5]	15′	15′	15′	--	15′	15′	--	133′	145′	--
	WB LT	160′[5]	60′	60′	70′	--	63′	73′	--	215′	245′	--
	WB T	160′[5]	53′	50′	60′	--	53′	60′	--	198′	223′	--
	WB R	225′								13′	13′	--
	NB L	50′	13′	13′	13′	--	13′	13′	--	13′	13′	--
	NB TR	50′	20′	20′	20′	--	20′	20′	--	15′	15′	--
	SB L	35′	55′	55′	55′	--	55′	55′	--	270′	270′	--
	SB TR	365′[5]	20′	20′	20′	--	20′	20′	--	168′	168′	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area
5 = Distance to nearest public intersection

TABLE 14 (CONT'D)
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement	Available Storage	Weekday P.M. Peak Hour									
			Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
				Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & McKean Road	EB L	350′	189′	207′	227′	--	210′	230′	--	43′	43′	--
	EB T	1000′+[5]								200′	220′	--
	WB T	870′[5]	126′	127′	140′	--	130′	144′	--	259′	296′	--
	WB R	230′	21′	20′	18′	--	21′	18′	--	25′	32′	--
	NB LTR	--	0′	0′	0′	--	0′	0′	--	0′	0′	--
	SB L	70′	275′	259′	272′	--	262′	274′	--	294′	307′	--
	SB R	820′[5]	68′	73′	87′	--	75′	89′	--	119′	126′	--
Norristown Road (SR 2052) / Sumneytown Pike & Bethlehem Pike	EB L	100′	65′	65′	65′	--	65′	65′	--	63′	63′	--
	EB T	585′[5]	648′	573′	620′	--	553′	593′	--	520′	558′	--
	EB R	305′	148′	143′	143′	--	143′	140′	--	135′	135′	--
	WB L	600′+	205′	205′	240′	--	208′	243′	--	318′	420′	--
	WB T	1000′+[5]	450′	433′	465′	--	433′	460′	--	490′	535′	--
	WB TR	1000′+[5]	455′	440′	470′	--	440′	465′	--	490′	533′	--
	NB L	135′	178′	185′	190′	--	190′	195′	--	203′	203′	--
	NB T	340′[5]	298′	305′	328′	--	313′	335′	--	350′	368′	--
	NB TR	340′[5]	293′	303′	323′	--	310′	330′	--	345′	358′	--
	SB L	325′	135′	140′	168′	--	145′	175′	--	180′	90′	--
	SB T	512′[5]	213′	218′	223′	--	223′	228′	--	238′	238′	--
	SB TR	110′	0′	0′	0′	--	0′	0′	--	0′	0′	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area
5 = Distance to nearest public intersection

TABLE 15
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement	Available Storage	Midday Saturday Peak Hour									
			Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
				Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	EB L	150′	0′	0′	35′	35′	0′	35′	35′	0′	35′	35′
	EB T	575′[5]	3′	3′	43′	43′	3′	43′	43′	3′	45′	45′
	WB T	50′[5]	5′	5′	8′	8′	5′	8′	8′	5′	8′	8′
	WB TR	605′	5′	5′	8′	8′	5′	8′	8′	5′	8′	8′
	SB L	250′[5]	3′	3′	75′	75′	3′	75′	75′	3′	75′	75′
	SB R	250′[5]	0′	0′	180′	180′	0′	180′	180′	0′	180′	180′
Norristown Road (SR 2052) & Beech Hollow Road	WB LT	895′[5]	0′	0′	0′	--	0′	0′	--	0′	0′	--
	NB LR	335′[5]	0′	0′	0′	--	0′	0′	--	0′	0′	--
Norristown Road (SR 2052) & Route 309 NB Ramps	EB L	110′	12′	13′	10′	--	13′	10′	--	17′	13′	--
	EB T	160′[5]	14′	12′	29′	--	13′	30′	--	19′	34′	--
	WB TR	350′+	88′	88′	110′	--	89′	111′	--	91′	111′	--
	NB L	350′	189′	212′	212′	--	215′	215′	--	212′	212′	--
	NB LT	350′	189′	212′	212′	--	216′	216′	--	213′	213′	--
	NB R	140′	53′	55′	61′	--	56′	61′	--	55′	60′	--
Norristown Road (SR 2052) & Route 309 SB Ramps	EB T	580′[5]	85′	81′	110′	--	84′	110′	--	94′	119′	--
	EB R	60′	130′	127′	134′	--	131′	134′	--	138′	142′	--
	WB L	110′	53′	51′	66′	--	51′	65′	--	52′	67′	--
	WB T	160′[5]	41′	46′	46′	--	47′	46′	--	46′	45′	--
	SB L	50′	49′	50′	50′	--	50′	51′	--	49′	52′	--
	SB R	1000′+[5]	0′	0′	0′	--	0′	0′	--	0′	0′	--
Norristown Road (SR 2052) & Tennis Avenue	EB L	100′	24′	24′	21′	--	24′	23′	--	25′	28′	--
	EB TR	885′[5]	35′	36′	59′	--	36′	60′	--	46′	66′	--
	WB L	70′	23′	23′	27′	--	24′	28′	--	25′	29′	--
	WB TR	950′[5]	238′	240′	285′	--	247′	296′	--	261′	314′	--
	NB LT	430′[5]	137′	137′	142′	--	137′	141′	--	142′	145′	--
	NB R	35′	9′	9′	9′	--	10′	9′	--	9′	9′	--
	SB LTR	1000′+[5]	135′	137′	134′	--	137′	134′	--	139′	135′	--
Norristown Road (SR 2052) & Residential Driveway/SHIP Driveway	EB L	250′	8′	8′	8′	--	8′	8′	--	3′	3′	--
	EB T	865′[5]								25′	28′	--
	EB TR	865′[5]	8′	8′	8′	--	8′	8′	--	25′	30′	--
	WB LT	160′[5]	10′	10′	13′	--	10′	13′	--	33′	38′	--
	WB T	160′[5]	8′	8′	10′	--	8′	10′	--	25′	28′	--
	WB R	225′								0′	0′	--
	NB L	50′	8′	8′	8′	--	8′	8′	--	8′	8′	--
	NB TR	50′	5′	5′	5′	--	5′	5′	--	5′	5′	--
	SB L	35′	8′	8′	8′	--	8′	8′	--	40′	40′	--
	SB TR	365′[5]	0′	0′	0′	--	0′	0′	--	25′	25′	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area
5 = Distance to nearest public intersection

TABLE 15 (CONT'D)
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement	Available Storage	Midday Saturday Peak Hour									
			Existing Condition	Opening Year 2027			Design Year 2032[1]			Design Year 2032[2]		
				Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]	Base	Proj.	Proj.[3,4]
Norristown Road (SR 2052) & McKean Road	EB L	350′	94′	95′	117′	--	96′	118′	--	37′	38′	--
	EB T	1000′+[5]								85′	106′	--
	WB T	870′[5]	117′	118′	147′	--	120′	148′	--	142′	175′	--
	WB R	230′	8′	8′	13′	--	9′	14′	--	11′	17′	--
	NB LTR	--	0′	0′	0′	--	0′	0′	--	0′	0′	--
	SB L	70′	91′	91′	98′	--	91′	100′	--	94′	102′	--
	SB R	820′[5]	34′	34′	33′	--	34′	34′	--	32′	31′	--
Norristown Road (SR 2052) / Sumneytown Pike & Bethlehem Pike	EB L	100′	55′	55′	53′	--	55′	55′	--	55′	55′	--
	EB T	585′[5]	225′	225′	243′	--	228′	245′	--	230′	250′	--
	EB R	305′	128′	128′	125′	--	128′	125′	--	128′	123′	--
	WB L	600′+	110′	108′	135′	--	110′	135′	--	120′	145′	--
	WB T	1000′+[5]	258′	255′	278′	--	258′	283′	--	268′	290′	--
	WB TR	1000′+[5]	260′	258′	278′	--	260′	283′	--	268′	290′	--
	NB L	135′	100′	100′	108′	--	103′	108′	--	105′	110′	--
	NB T	340′[5]	213′	215′	240′	--	218′	243′	--	228′	253′	--
	NB TR	340′[5]	215′	215′	238′	--	218′	240′	--	228′	250′	--
	SB L	325′	95′	95′	123′	--	98′	123′	--	108′	135′	--
	SB T	512′[5]	168′	170′	180′	--	173′	183′	--	178′	188′	--
	SB TR	110′	0′	0′	0′	--	0′	0′	--	0′	0′	--

Base = No-Build scenario, Proj. = Build scenario
1 = Without SHIP Traffic and Roadway Improvements
2 = With SHIP Traffic and Roadway Improvements
3 = with site-related improvements
4 = Signal timing adjustments proposed at all signalized intersections within the study area
5 = Distance to nearest public intersection

The queues are accommodated within the available storage in most cases.

With respect to the eastbound Norristown Road left turn queue storage area approaching Tennis Avenue, the Applicant will coordinate with the Township and PennDOT on the possibility of shifting where the transition occurs between the one (1) westbound lane to two (2) westbound lanes further west in order to extend the existing eastbound left turn lane approaching Tennis Avenue in order to accommodate the existing and projected queues. In regard to the eastbound Sumneytown Pike approach to Bethlehem Pike, based on a review of the conditions in the field, the available storage within the eastbound approach accommodates the existing queues, which was confirmed by the Township Traffic Engineer. The difference between the field observations (i.e. actual operations) and the analysis conducted relates to the use of an adaptive traffic signal system at this intersection. Due to the complications in modeling an adaptive system, the analysis conducted in the Traffic Impact Study should be considered conservative (i.e. less efficient than actual operations).

Queue analysis worksheets are included with the capacity analysis worksheets provided in **Appendix H.**

AUXILIARY TURN LANE ANALYSIS

Methodology

TPD evaluated auxiliary turn lane warrants at the site access intersection. The warrant analysis methodology contained within Chapter 11 of PennDOT's *Publication 46*, Section 11.17 and Strike-Off Letter 470-08-07 was utilized for this evaluation.

Findings

Table 16 summarizes the results of the auxiliary turn lane analysis at the site access intersections.

TABLE 16
AUXILIARY TURN LANE ANALYSIS SUMMARY

Intersection	Auxiliary Lane	Warrant Satisfied?	Required Lane Length	Proposed Lane Length
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	EB Left-Turn Lane	Yes	250'	250'
	WB Right-Turn Lane	Yes	175'	--

As shown in **Table 16**, warrants are satisfied for a 250' eastbound left turn lane and a 175' westbound right turn lane at the existing signalized site driveway (Boveri Drive). TPD recommends restriping the existing gore area located before the existing eastbound left turn lane in order to accommodate the additional storage length warranted for the eastbound left turn lane.

While a 175' westbound right turn lane is warranted, there exists a steep drop off adjacent to the existing shoulder area on the northern side of Norristown Road (SR 2052). In addition, a newly constructed walking trail also precludes the construction of the right turn lane. Furthermore, as shown above in **Tables 10-15**, the westbound approaches operate at LOS A with the longest queue in the westbound direction projected to be less than one (1) vehicle length. Therefore, TPD does not recommend the installation of a westbound right turn lane. The calculations for the auxiliary turn lane warrants are included in **Appendix J**.

RECOMMENDATIONS

TPD has made the following recommendations in relation to the proposed Springhouse Mixed-Use development in Lower Gwynedd Township, Montgomery County, as outlined in **Table 17**.

TABLE 17
RECOMMENDATIONS

Intersection	Recommendation
Norristown Road (SR 2052) Corridor	Optimize traffic signals timings at the signalized study area intersections.
Norristown Road (SR 2052) & Boveri Drive (Site Driveway)	Restripe the Eastbound Left Turn Lane to increase the storage length to 250 feet.
	Extend the southbound Boveri Drive right turn lane, via widening, to the first internal intersection in order to accommodate future queue lengths.
	Work with the Township and PennDOT on potential traffic signal equipment upgrades.
	Work with the Township and PennDOT on potential traffic signal timing modifications to increase the green time on the westbound Norristown Road approach in order to create a gap in the eastbound traffic to facilitate turns in/out of Beech Hollow Road.
	Maintenance of on-site vegetation to maximize available sight distance.
Norristown Road (SR 2052) & Tennis Avenue (SR 2020)	Coordinate with the Township and PennDOT on shifting where the transition occurs between the one (1) westbound lane to two (2) westbound lanes further west in order to extend the existing eastbound left turn lane approaching Tennis Avenue.
Norristown Road Frontage	Provide a 10' wide trail beginning within the site and connecting to the existing trail located to the east of the site.
	Provide a 10' wide trail along the property's frontage.
	Provide sidewalk extending across the northbound Route 309 on-ramp, under Route 309, across the southbound Route 309 off-ramp and terminating at/near the SHIP property to the west of the site.
	Provide PennDOT compliant crosswalks and pedestrian traffic signal equipment at the existing signalized intersections between Boveri Drive and the Route 309 southbound off-ramp.

CONCLUSIONS

- The project site is located on the northwestern corner of Norristown Road (SR 2052) and Boveri Drive and currently consists of 143,295 sf of office space.
- The proposed site will be redeveloped and will consist of the following uses:
  - 77,619 sf of Office Space;
  - A 30,750 sf Grocery Store;
  - 16,000 sf of Retail Space;
  - 278 mid-rise apartments.
- Access to the Proposed Site will be provided via one (1) full-access signalized driveway via existing Boveri Drive. In addition, an emergency access will be provided in coordination with the Township Fire Marshal.

- All measured sight distances at the site driveway exceed the acceptable sight distances and, in most cases, exceed PennDOT's desirable sight distance requirements.
- Upon full build-out, the proposed development is expected to generate **311 new trips** during the weekday A.M. peak hour, **339 new trips** during the weekday P.M. peak hour, and **382 new trips** during the Saturday midday peak hour.
- The Existing Site (at full capacity) will generate **180 new trips** during the weekday AM peak hour, **173 new trips** during the weekday PM peak hour, and **126 new trips** during the Saturday Midday peak hour.
- When compared to the Existing Site (at full capacity), the **Proposed Site** will generate **131 more net new trips** during the weekday AM peak hour, **166 more net new trips** during the weekday PM peak hour, and **256 more net new trips** during the Saturday Midday peak hour**.**
- Under the 2027 and 2032 projected conditions, with the development of the proposed site, with site-related recommendations outline in **Table 17,** all study area intersections will satisfy PennDOT ILOS Standards.

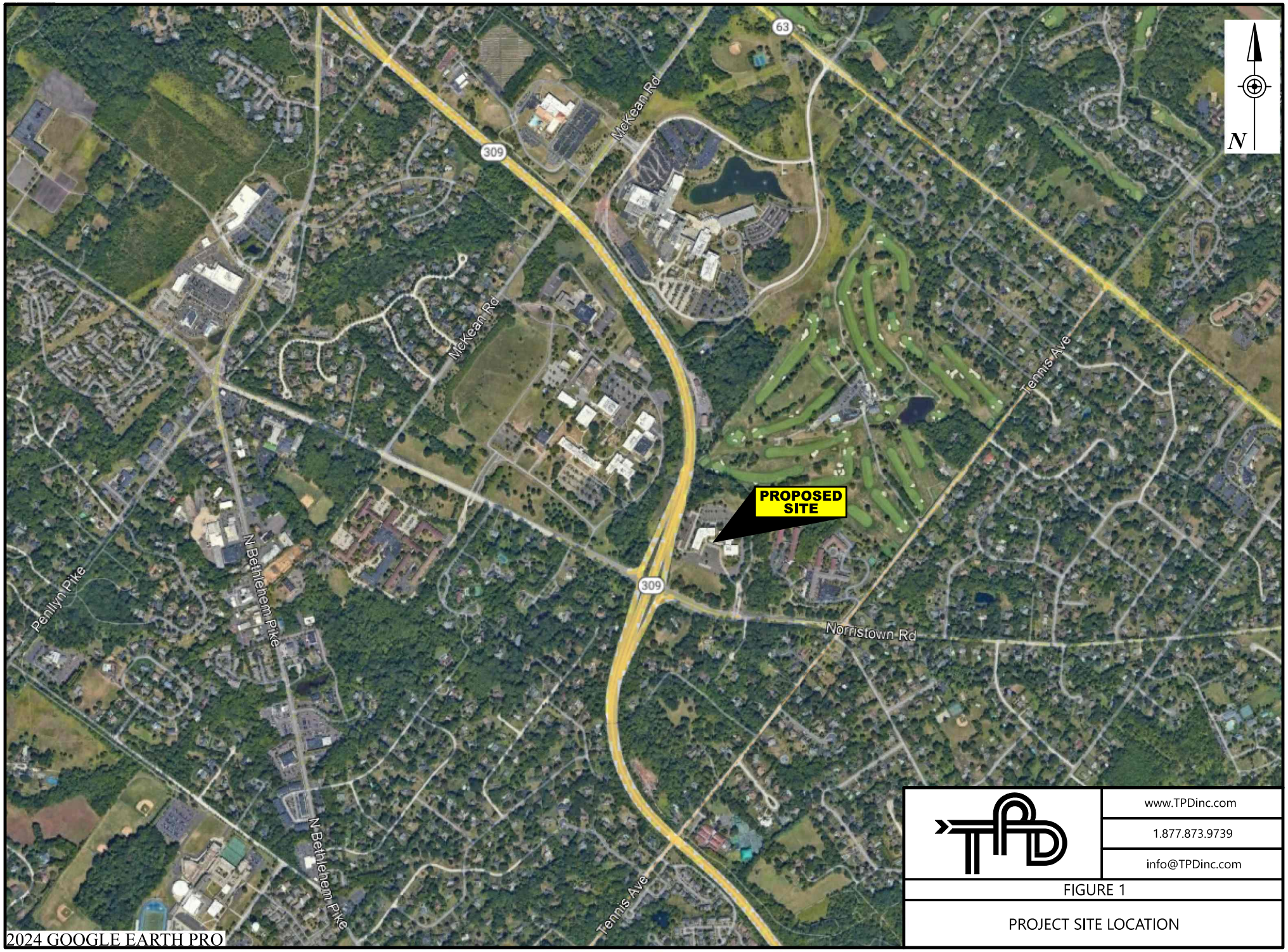

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FIGURE 1

PROJECT SITE LOCATION

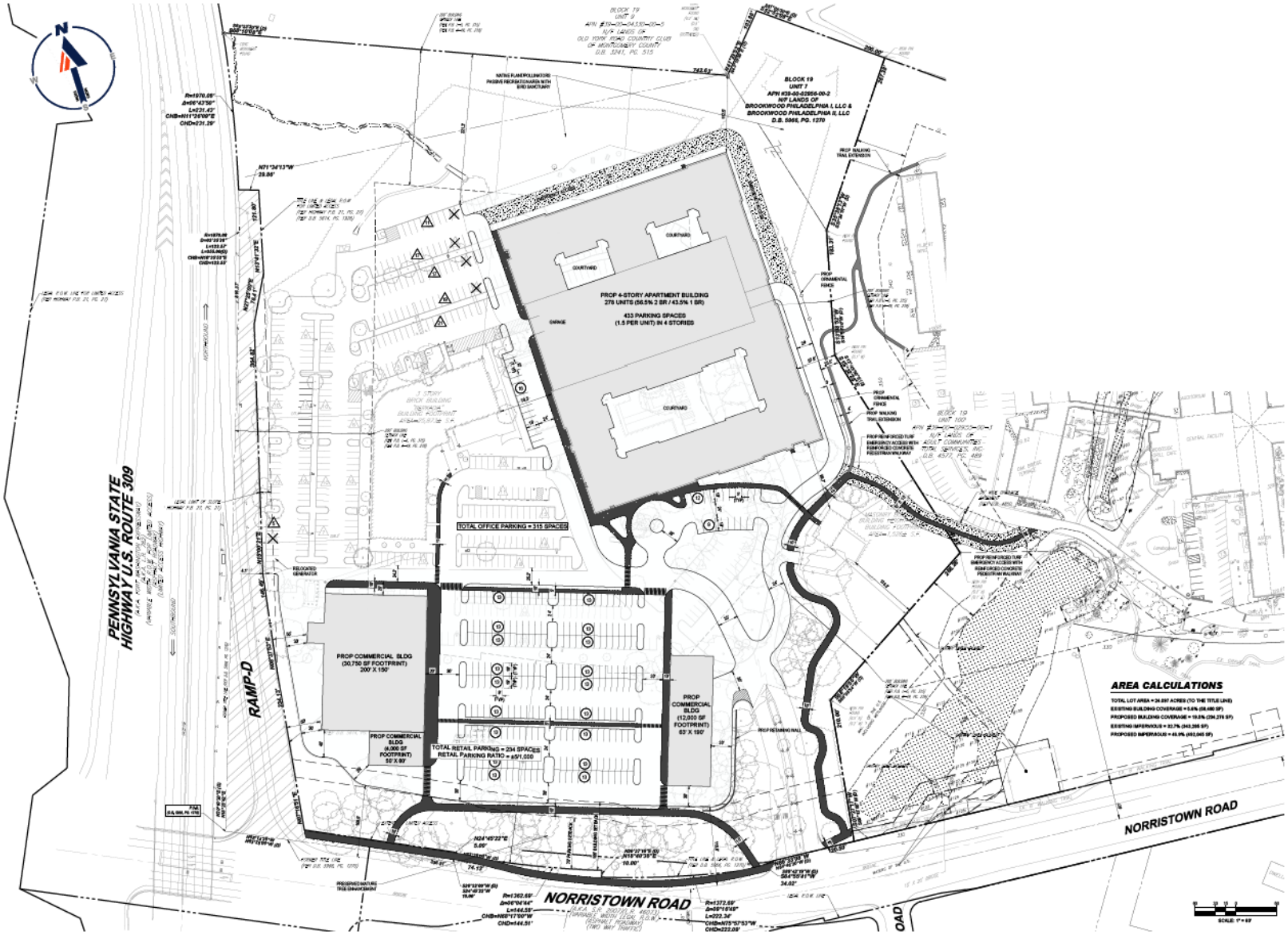

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FIGURE 2

PROPOSED SITE PLAN

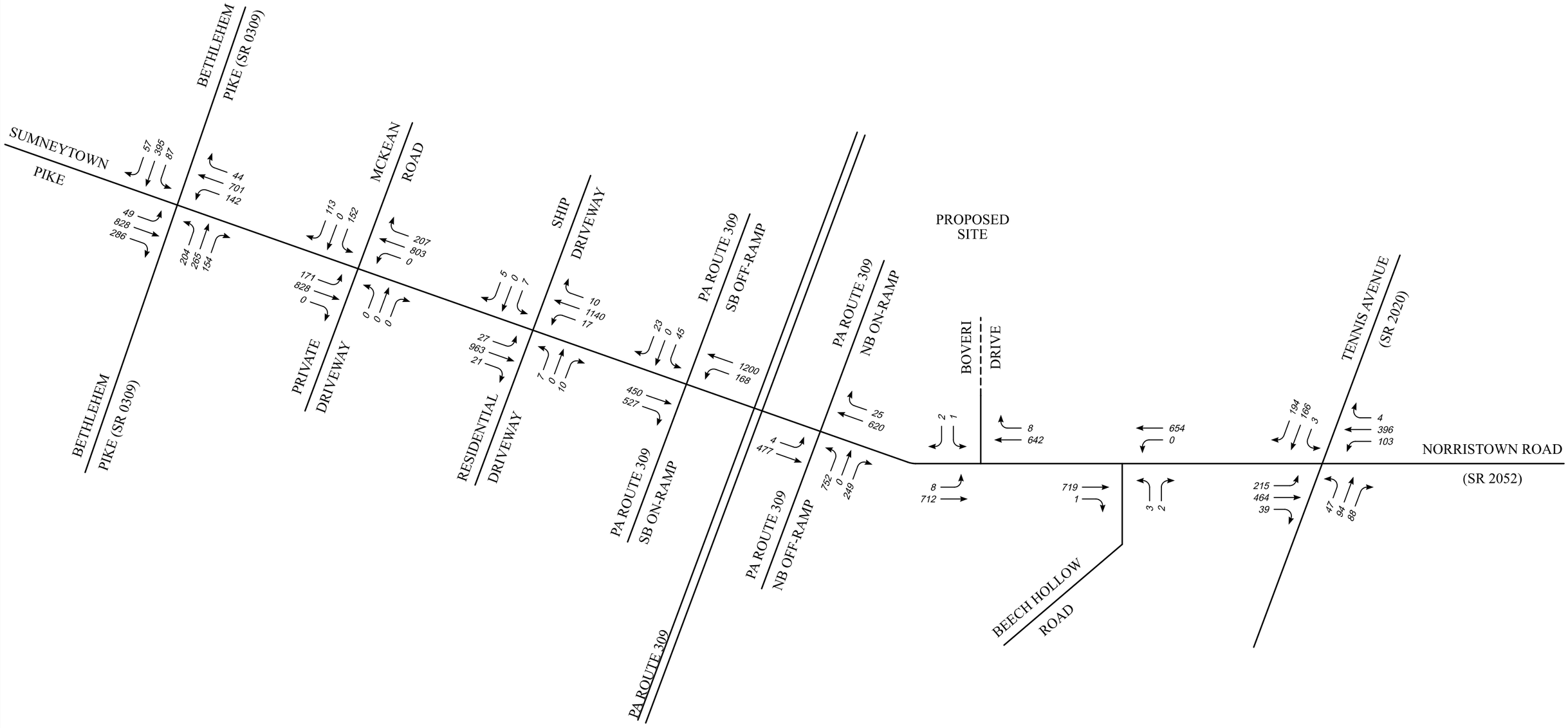

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FIGURE 3

2024 EXISTING CONDITIONS
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES

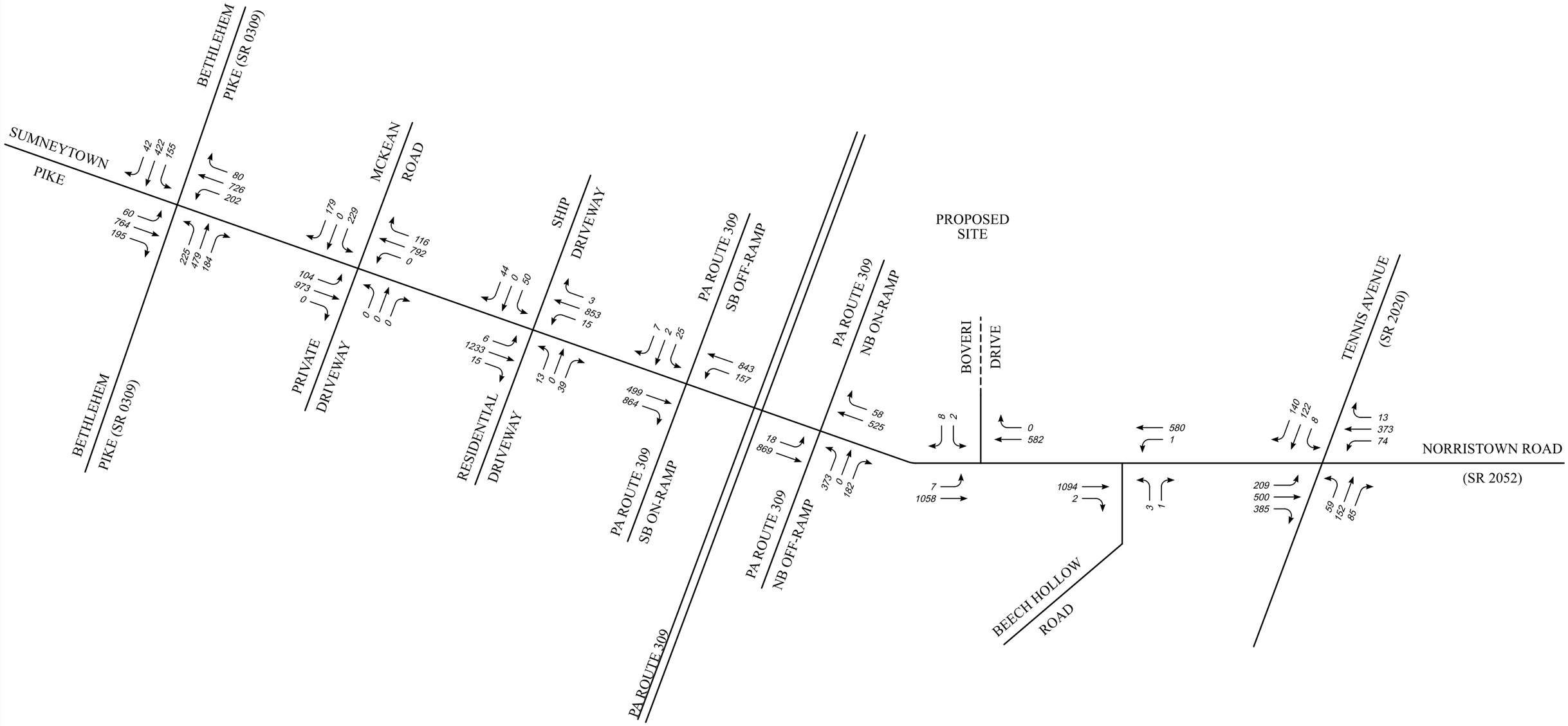

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FIGURE 4

2024 EXISTING CONDITIONS
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES

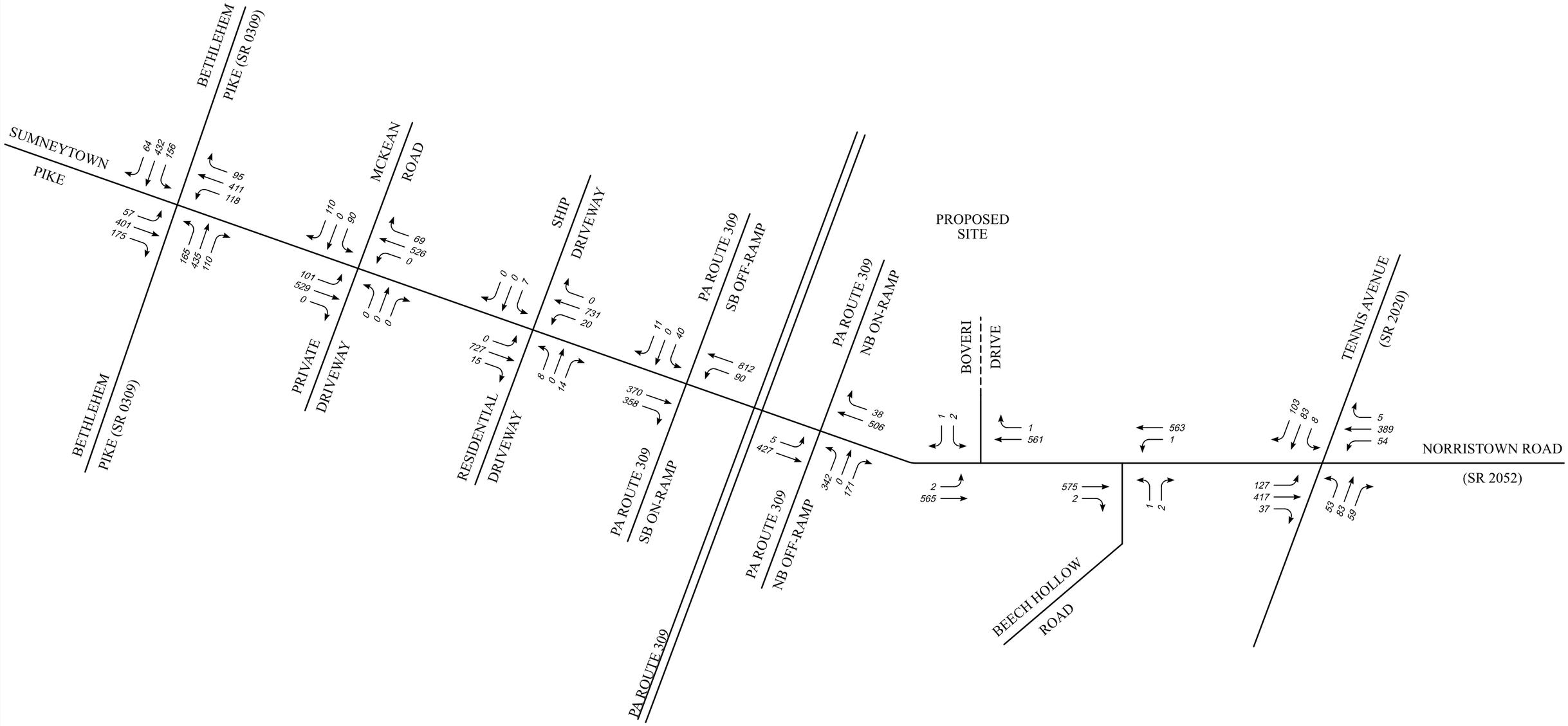

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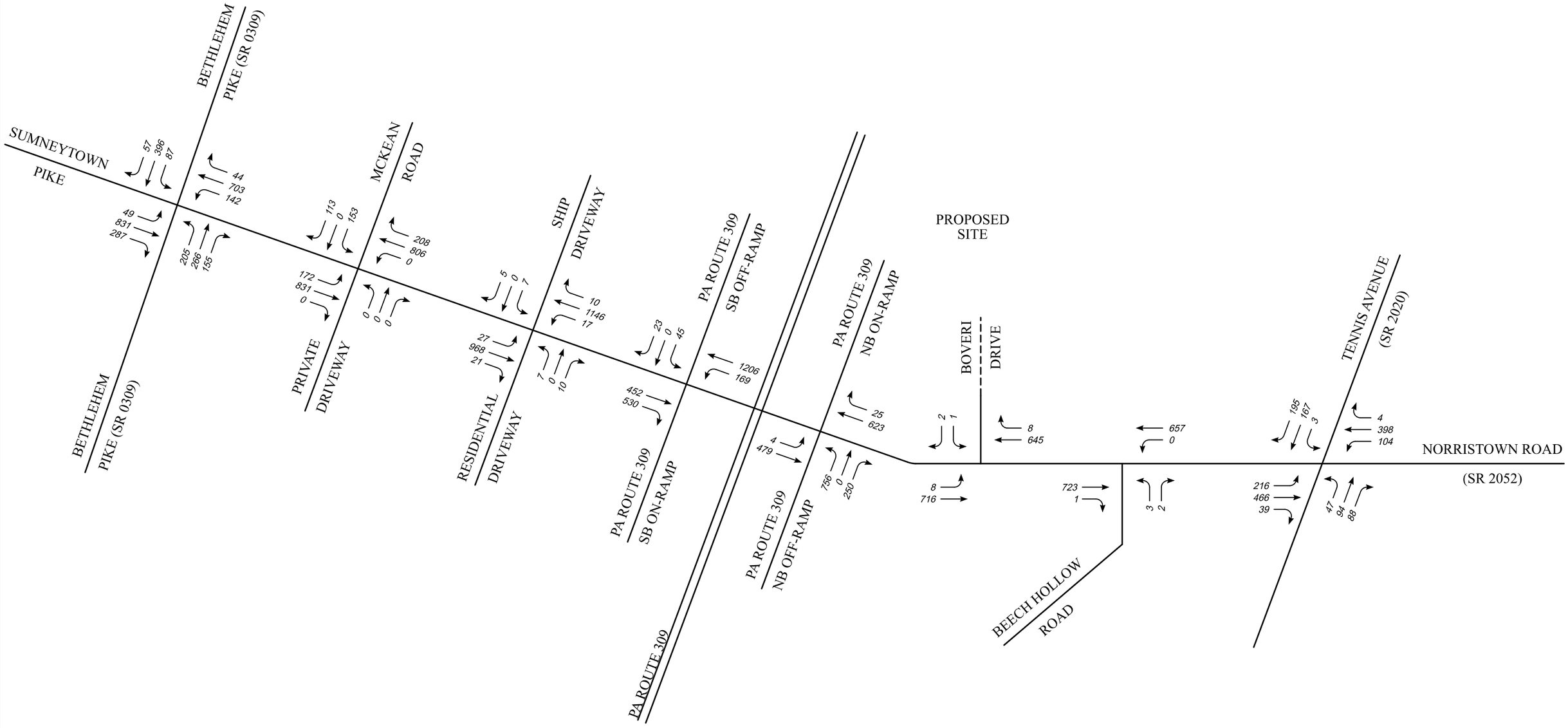
FIGURE 5

2024 EXISTING CONDITIONS
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES



KEY:

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FIGURE 6

2027 BASE CONDITIONS
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES

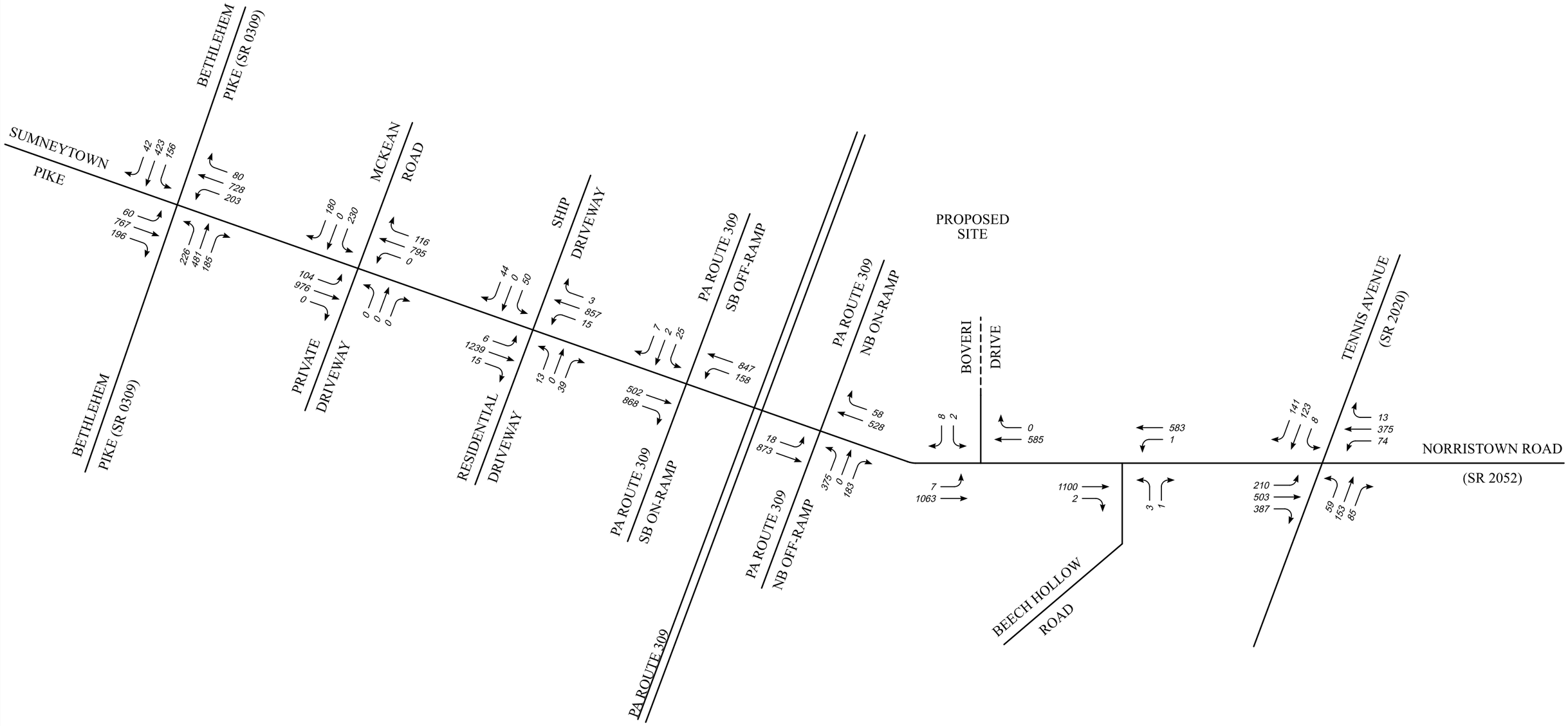

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FIGURE 7

2027 BASE CONDITIONS
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES

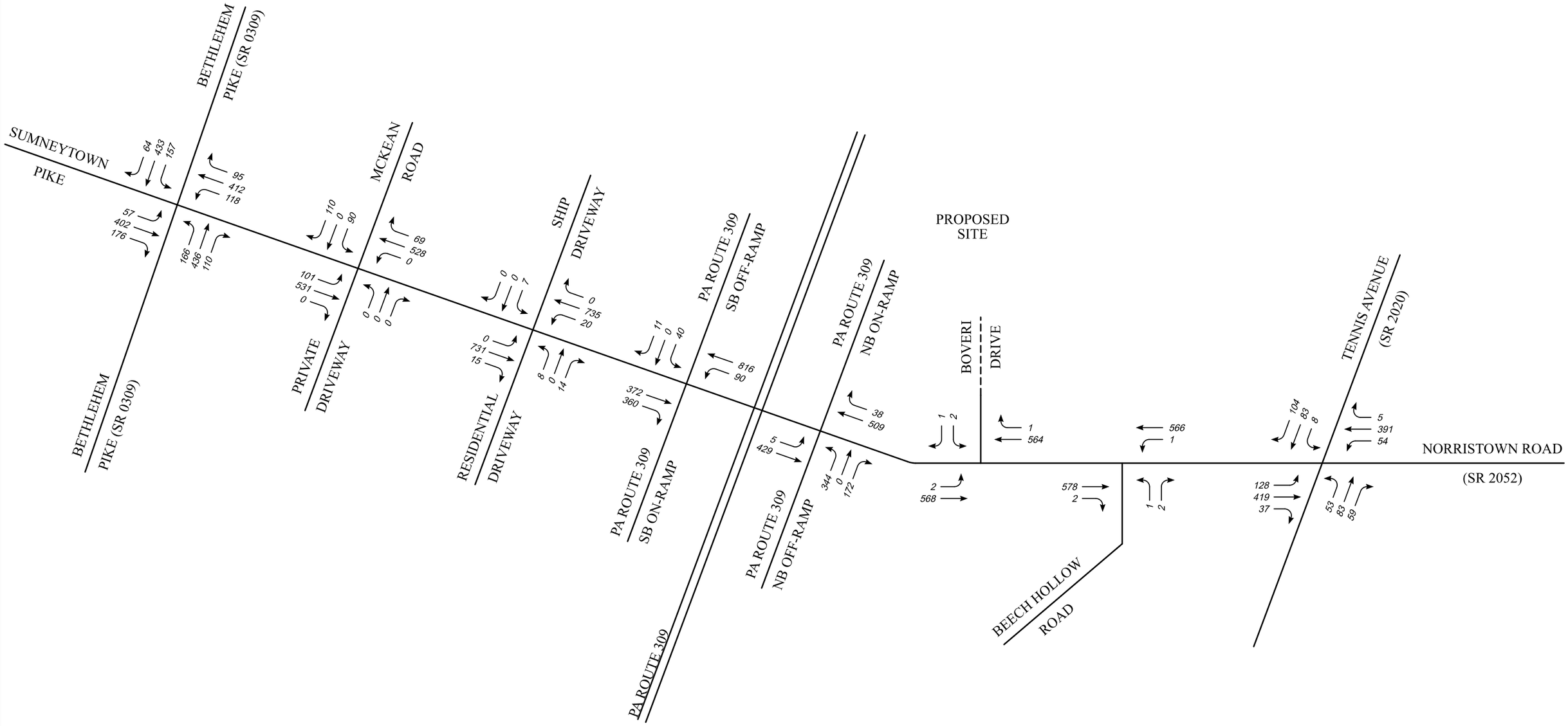

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FIGURE 8

2027 BASE CONDITIONS
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES

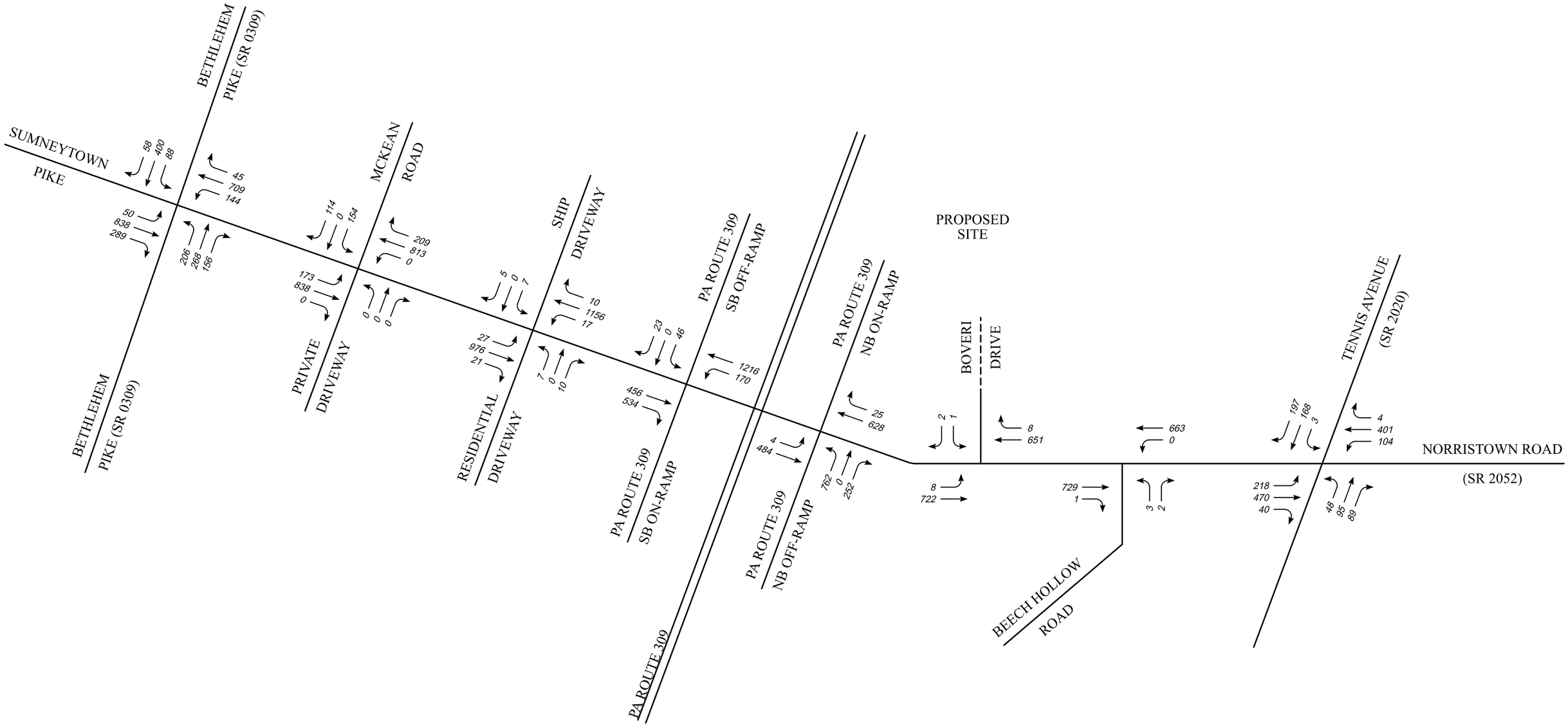

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FIGURE 9

2032 BASE CONDITIONS WITHOUT SHIP
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES

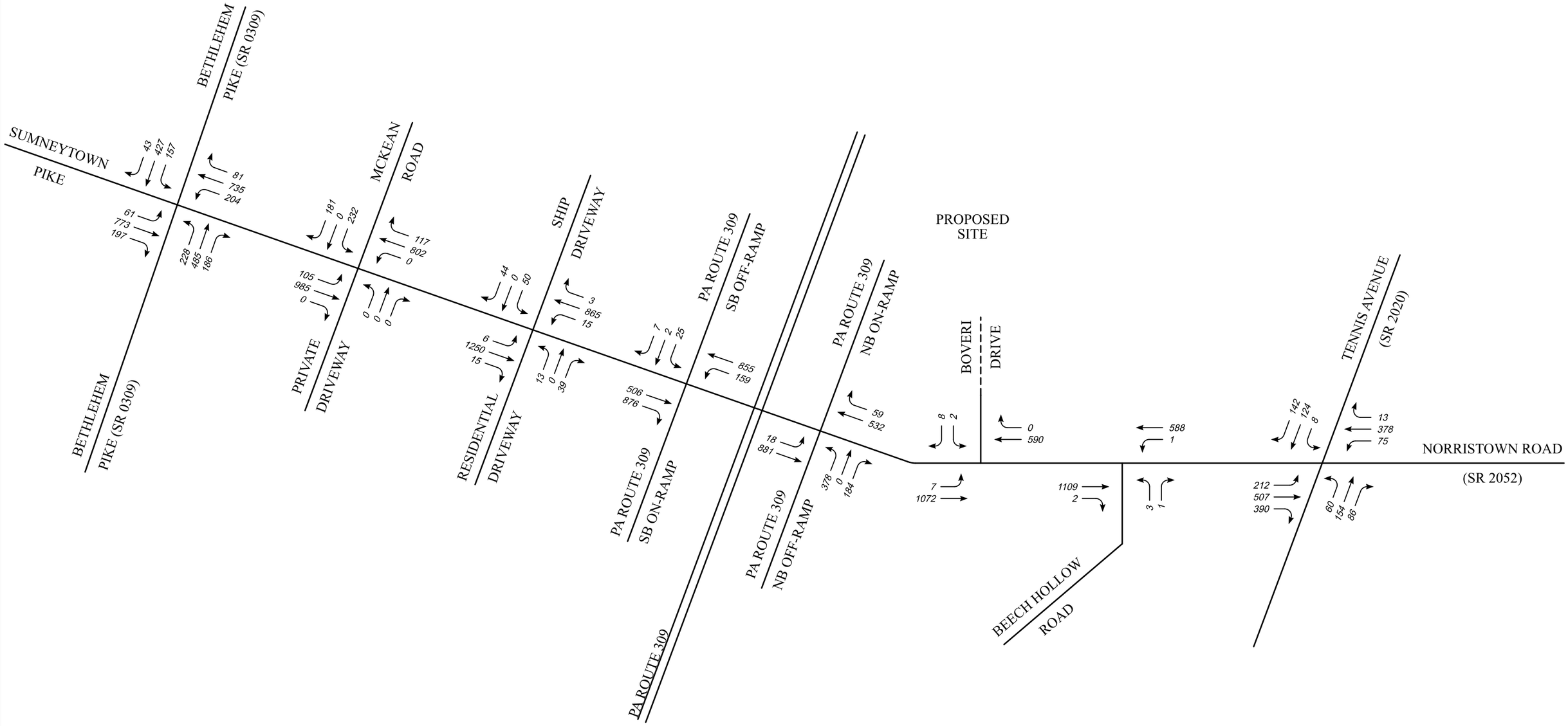

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FIGURE 10

2032 BASE CONDITIONS WITHOUT SHIP
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES

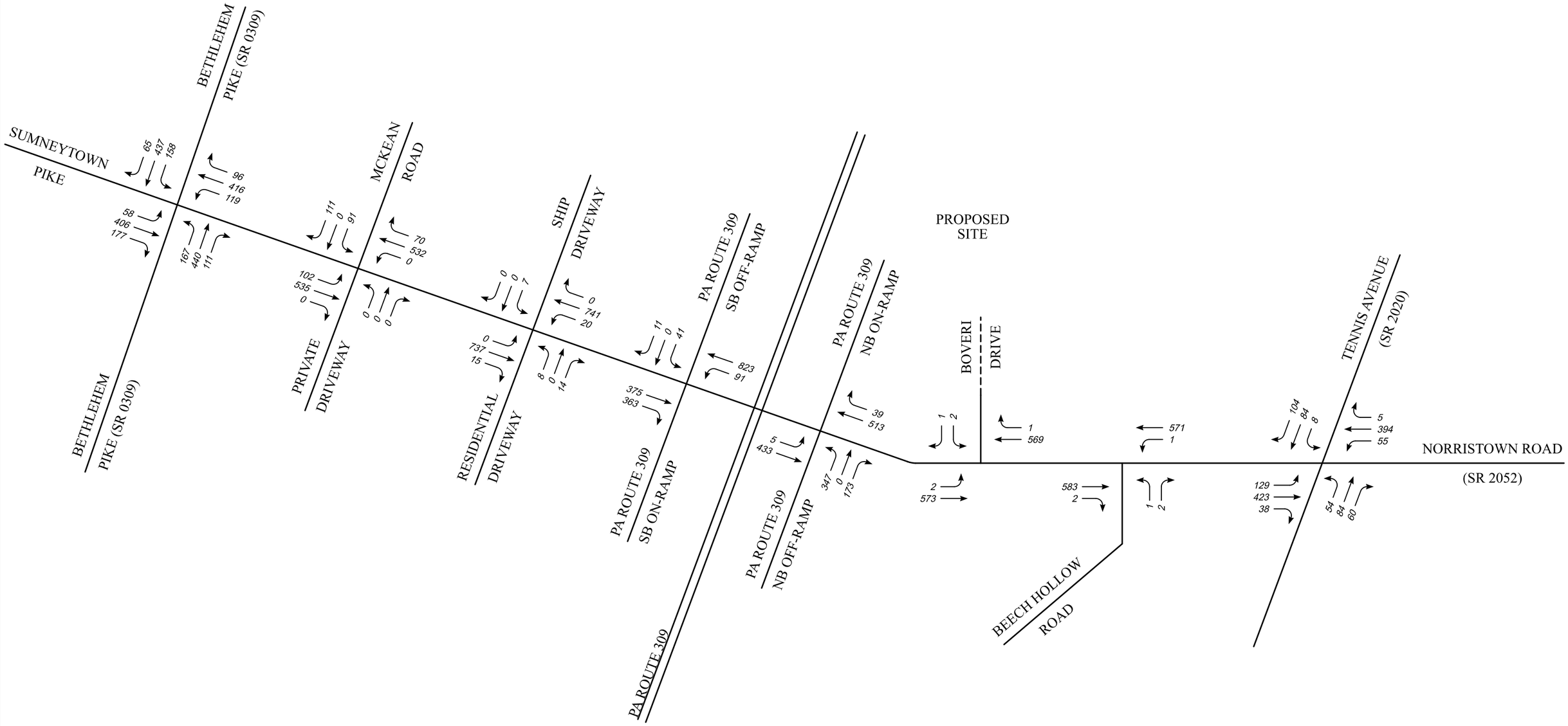

FIGURE 11

2032 BASE CONDITIONS WITHOUT SHIP
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES

KEY:

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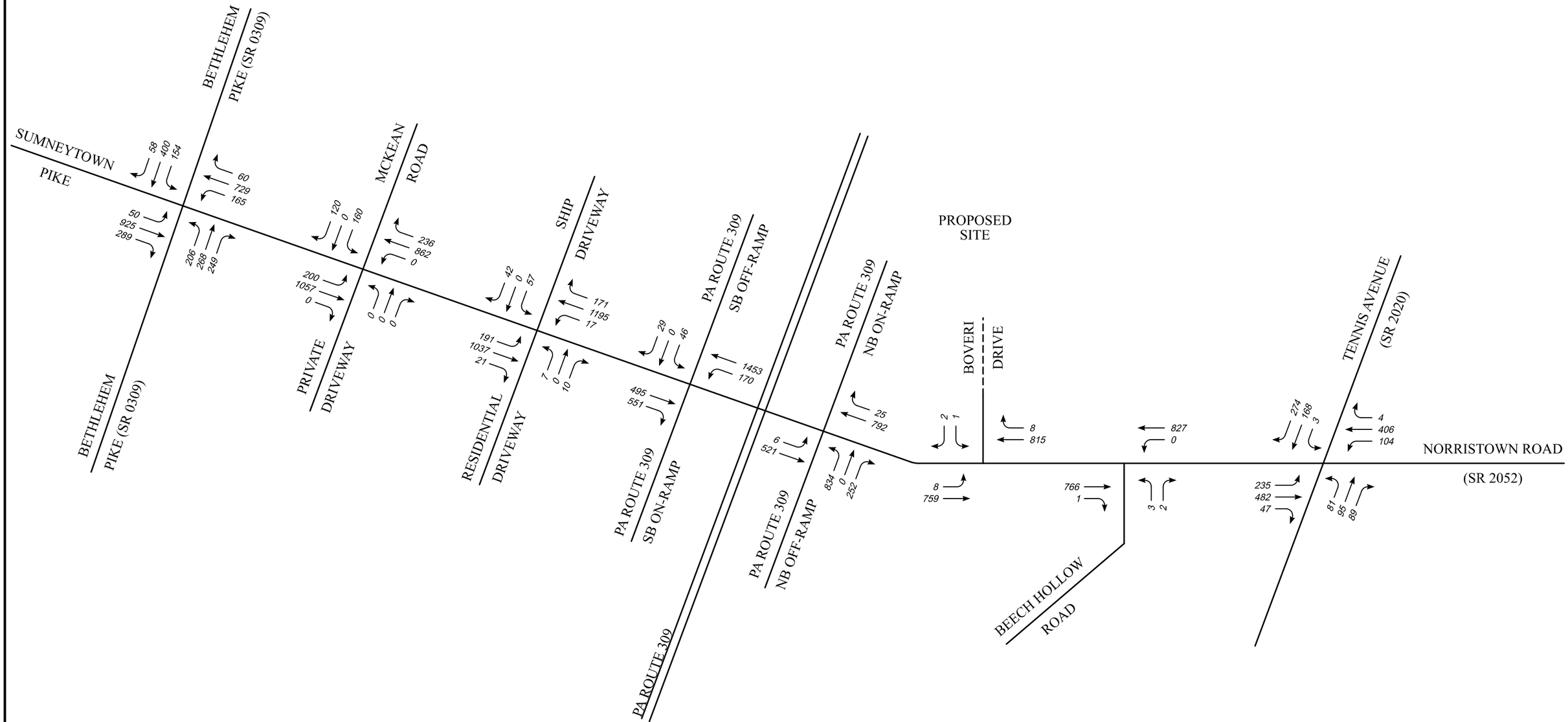

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FIGURE 12

2032 BASE CONDITIONS WITH SHIP
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES

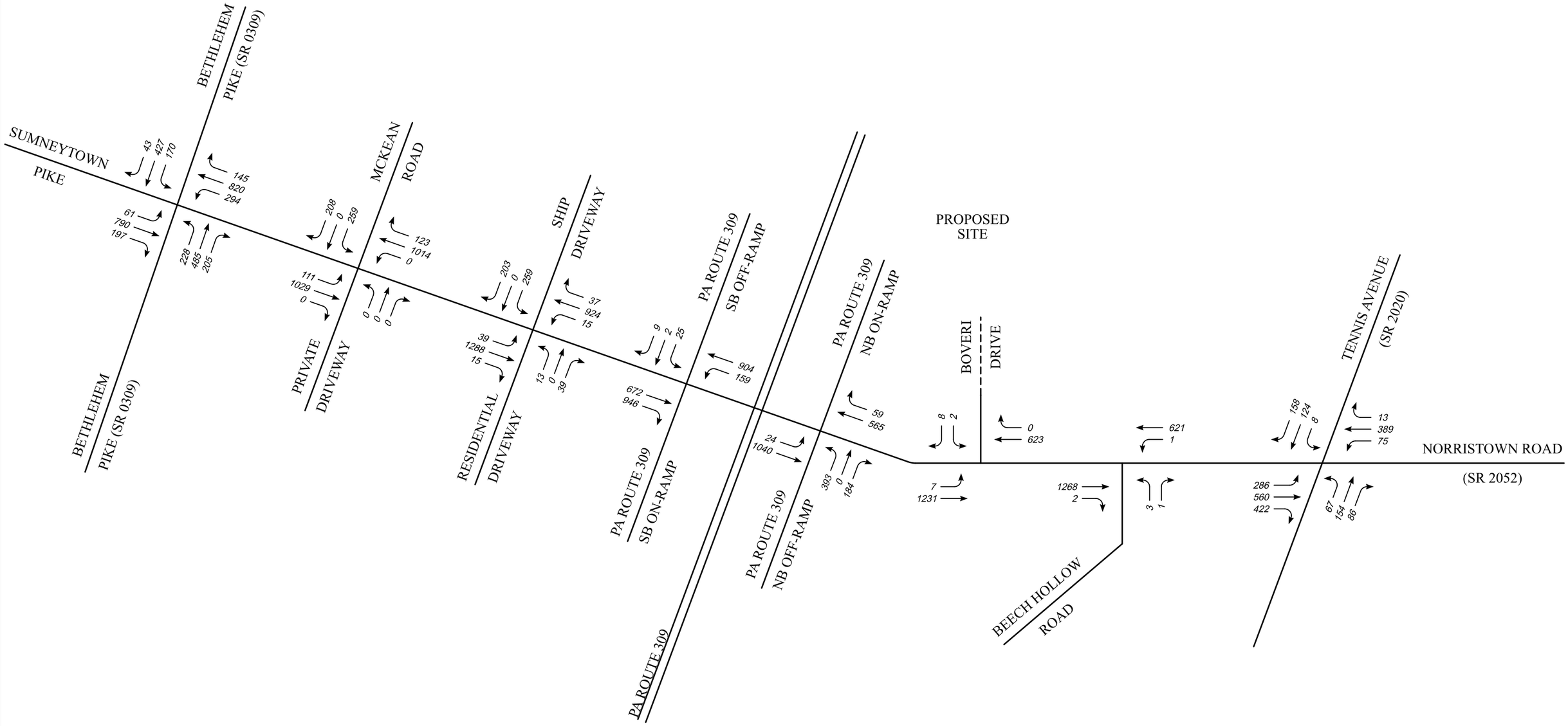

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FIGURE 13

2032 BASE CONDITIONS WITH SHIP
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES

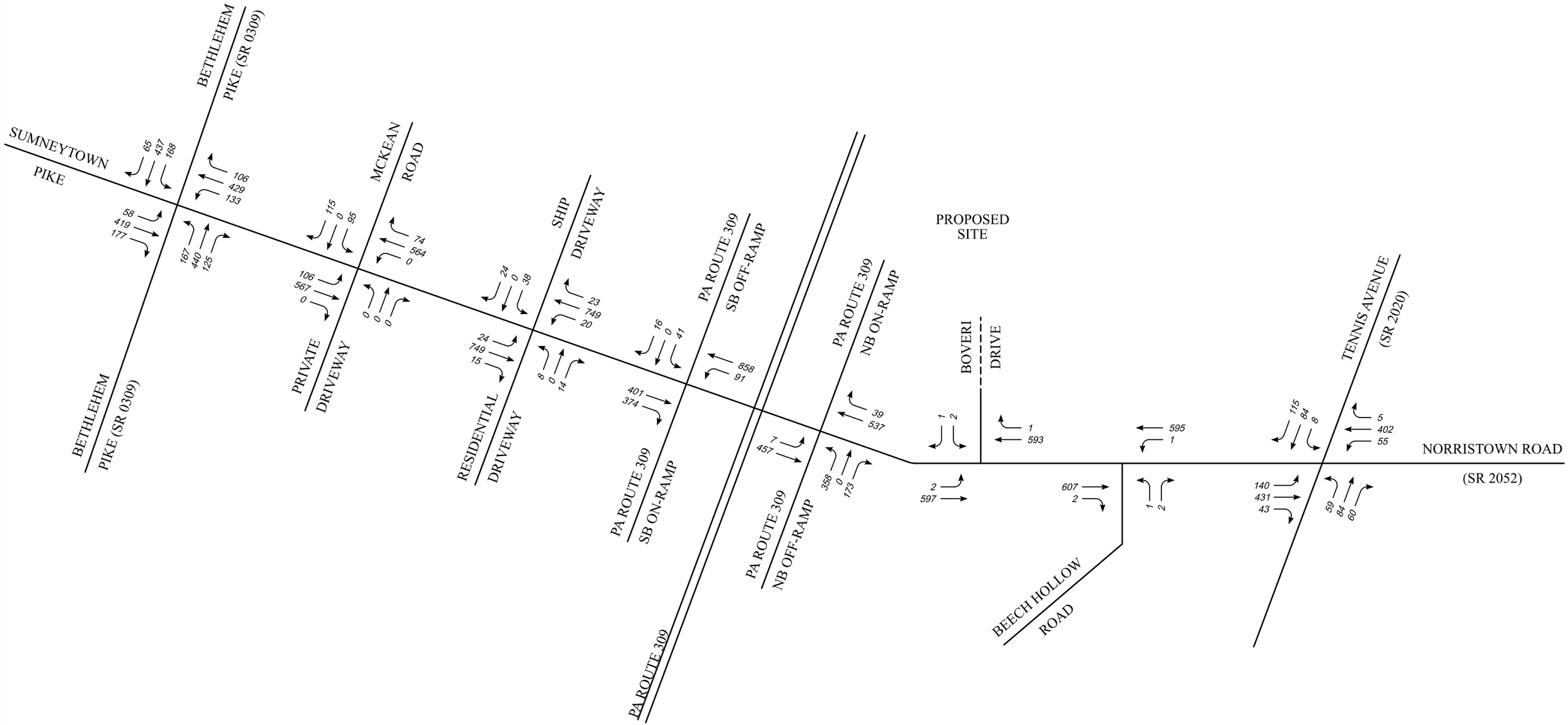

FIGURE 14

2032 BASE CONDITIONS WITH SHIP
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES

KEY:

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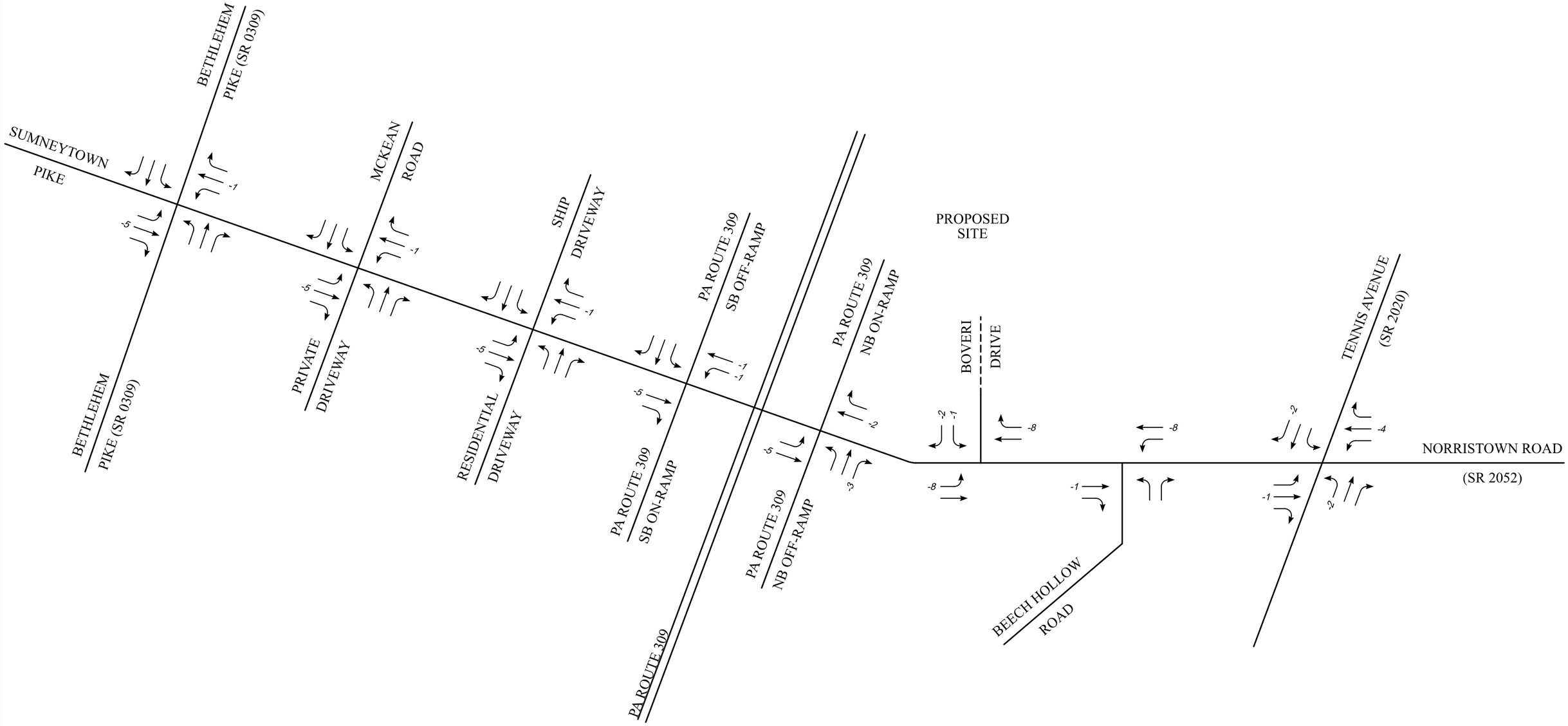
SCHEMATIC DRAWING:NOT TO SCALE



KEY:

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FIGURE 15

BASE REDISTRIBUTION
WEEKDAY A.M. PEAK HOUR
TRIP DISTRIBUTION

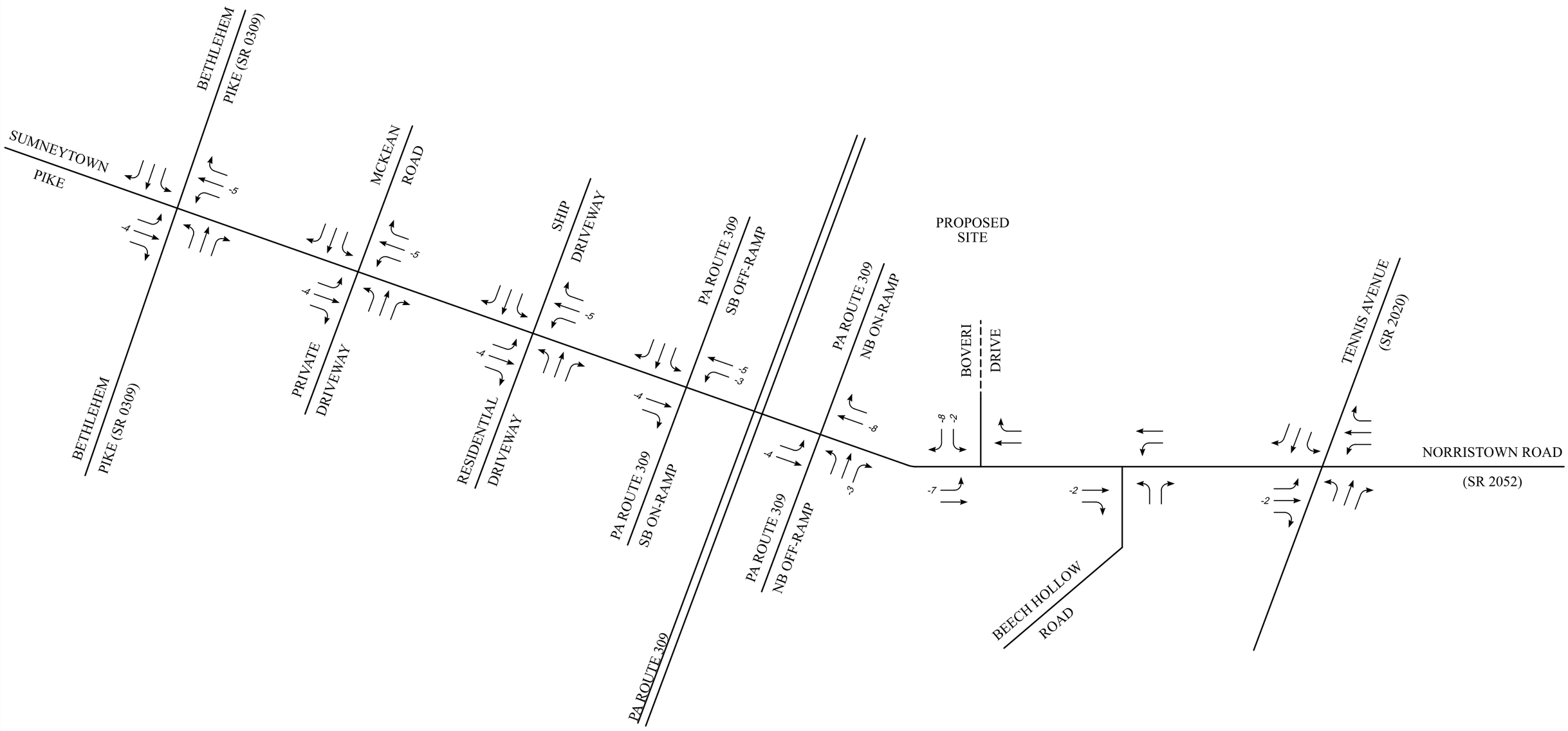

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FIGURE 16

BASE REDISTRIBUTION
WEEKDAY P.M. PEAK HOUR
TRIP DISTRIBUTION

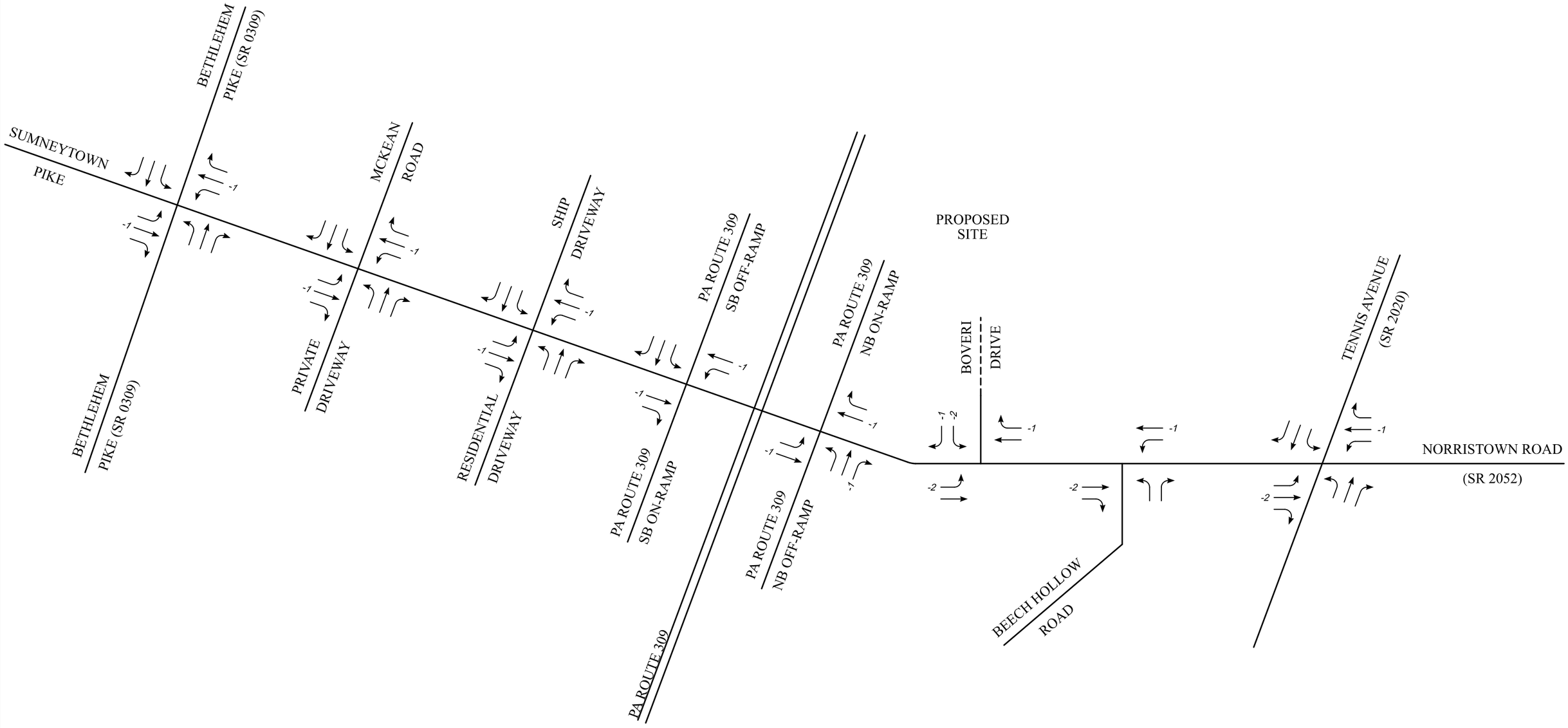

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FIGURE 17

BASE REDISTRIBUTION
MIDDAY SATURDAY PEAK HOUR
TRIP DISTRIBUTION

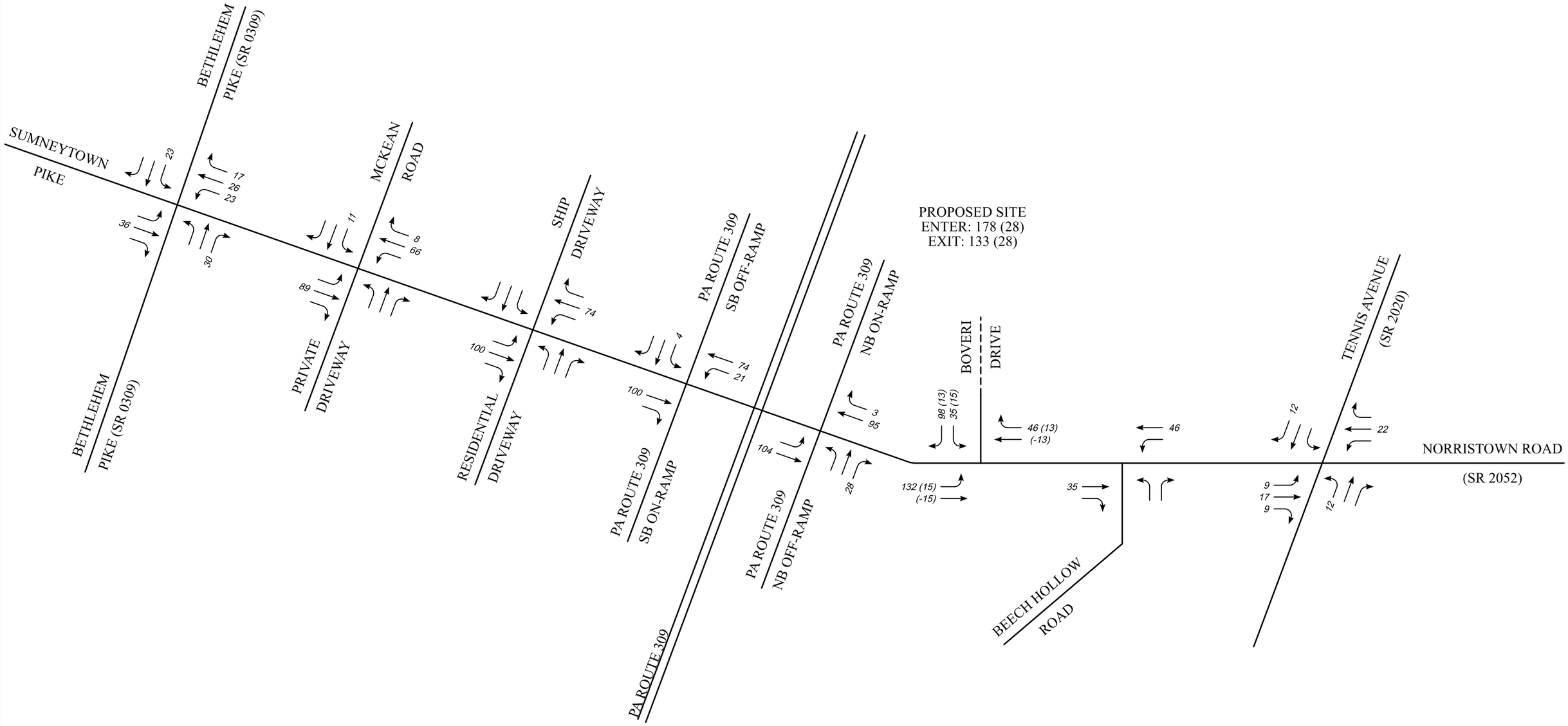

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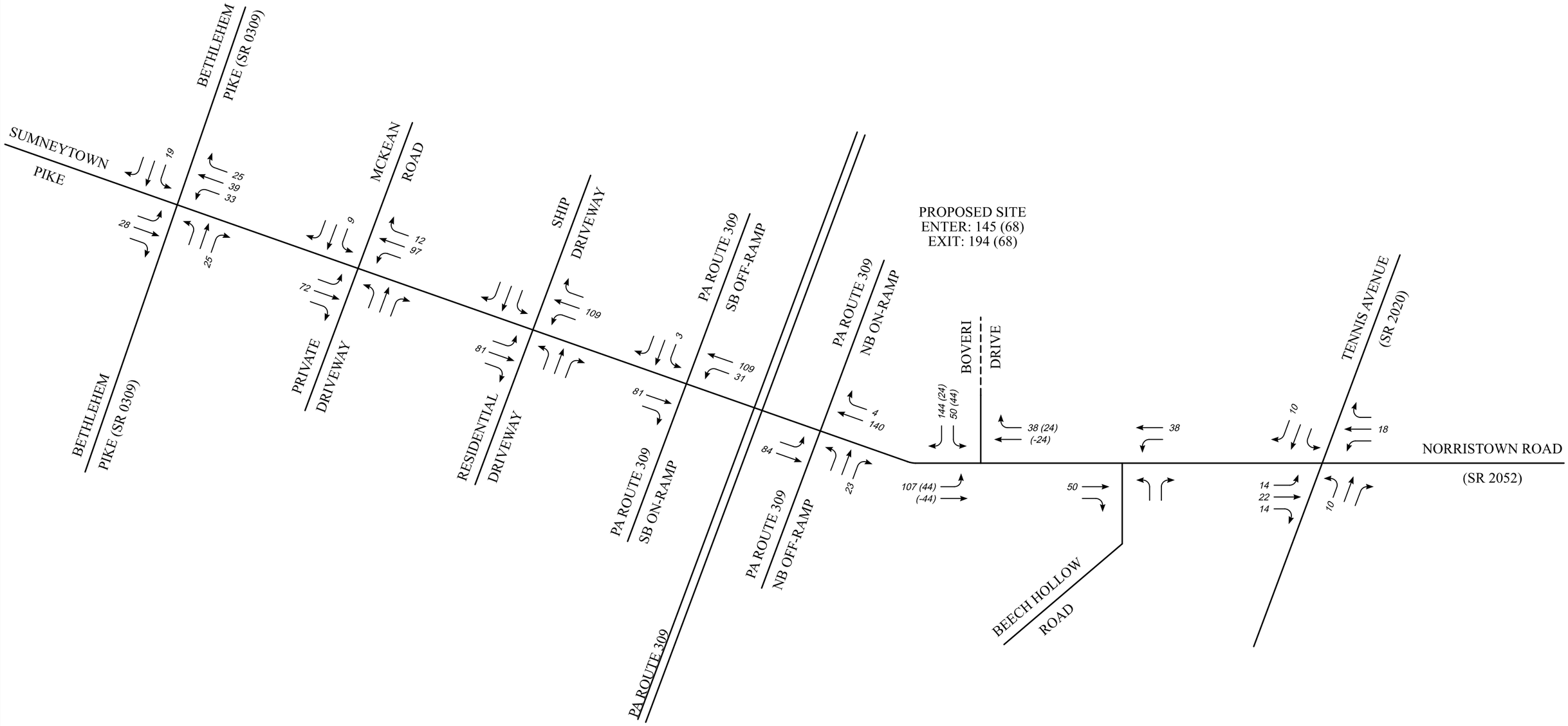
FIGURE 18

SPRINGHOUSE MIXED USE DEVELOPMENT
WEEKDAY A.M. PEAK HOUR
TRIP DISTRIBUTION



KEY:

- - - - - PROPOSED DRIVEWAY

NEW(PASS-BY)TRIPS

SCHEMATIC DRAWING:NOT TO SCALE

N

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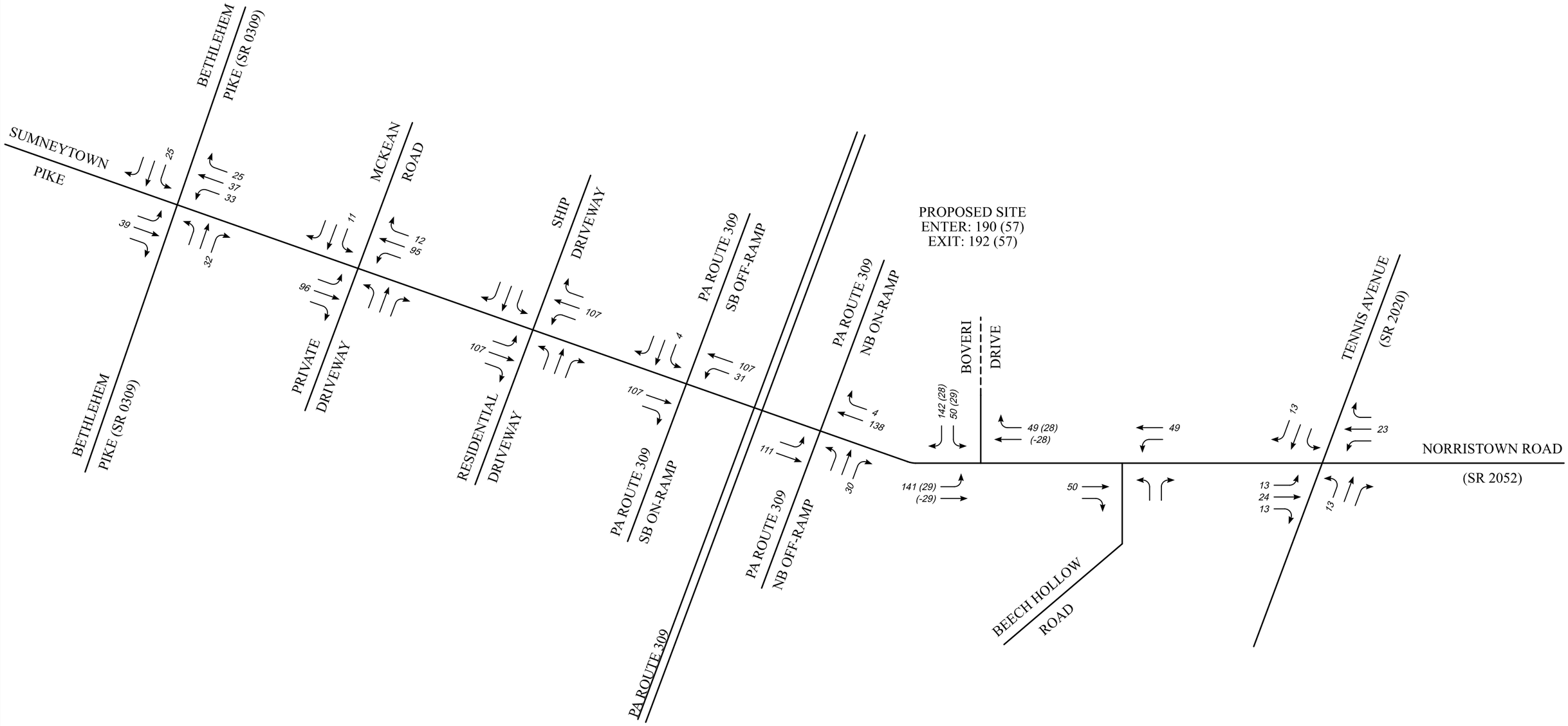
FIGURE 19

SPRINGHOUSE MIXED USE DEVELOPMENT
WEEKDAY P.M. PEAK HOUR
TRIP DISTRIBUTION



KEY:

– – – – – PROPOSED DRIVEWAY

NEW(PASS-BY)TRIPS

SCHEMATIC DRAWING:NOT TO SCALE

N

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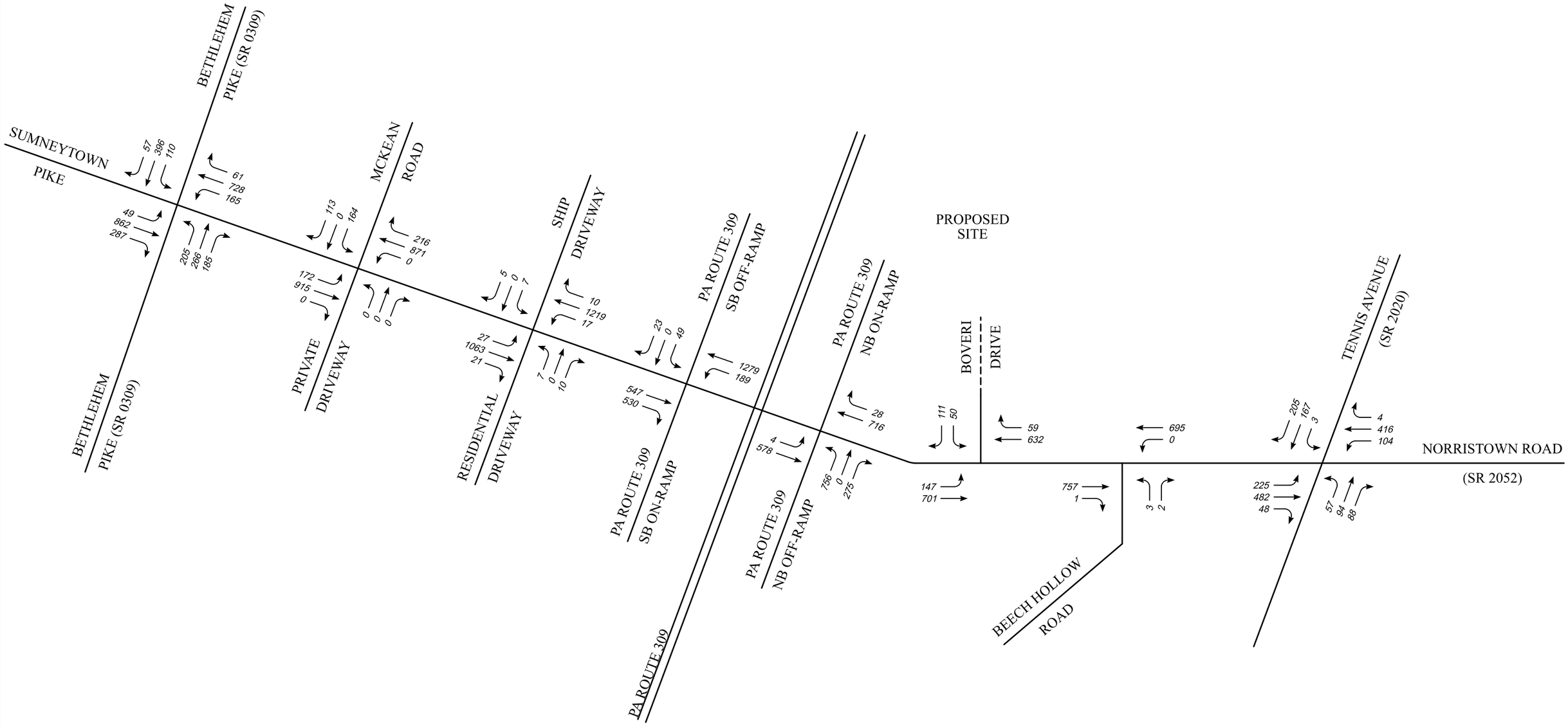
FIGURE 20

SPRINGHOUSE MIXED USE DEVELOPMENT
MIDDAY SATURDAY PEAK HOUR
TRIP DISTRIBUTION



KEY:

- - - - - - **PROPOSED DRIVEWAY**

SCHEMATIC DRAWING:NOT TO SCALE

N

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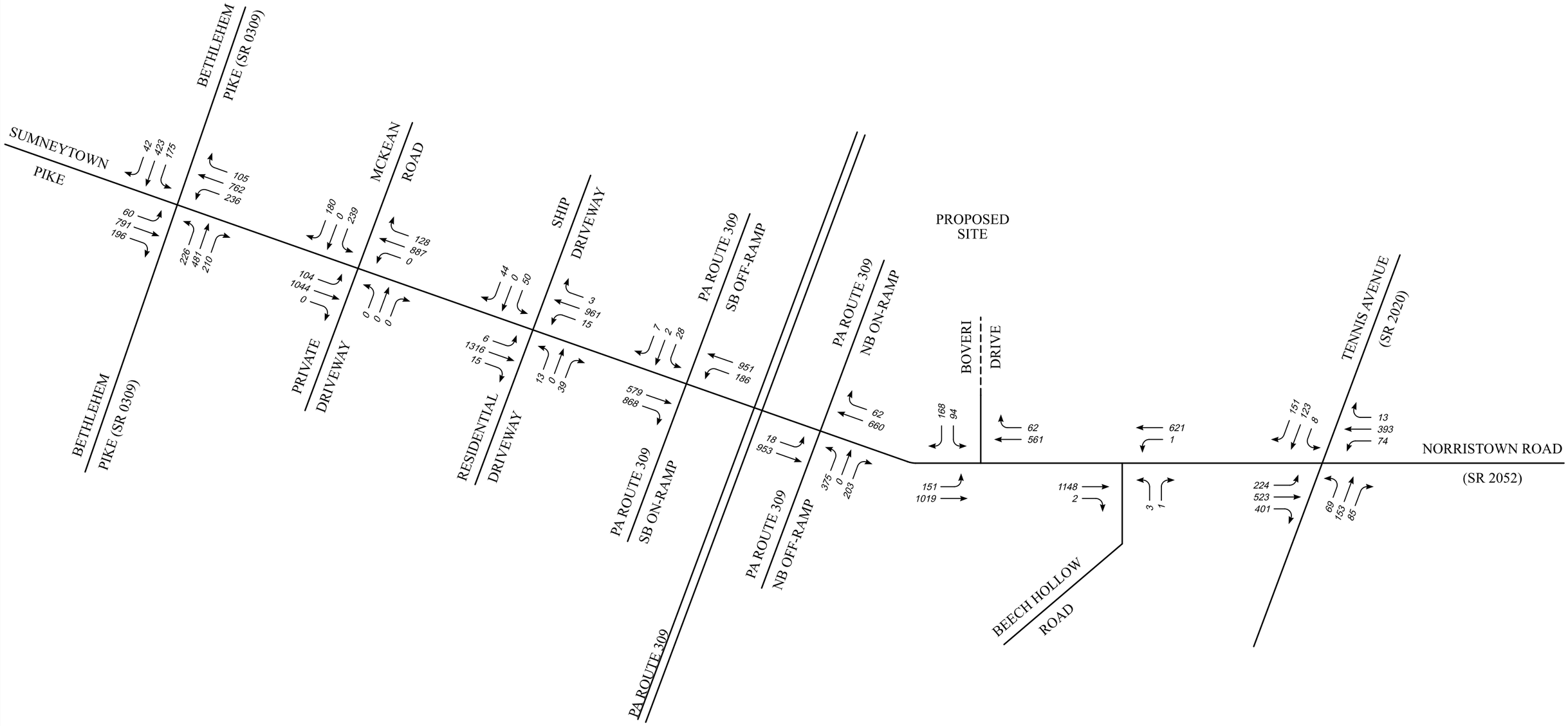
FIGURE 21

2027 PROJECTED CONDITIONS
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES



KEY:

– – – – – PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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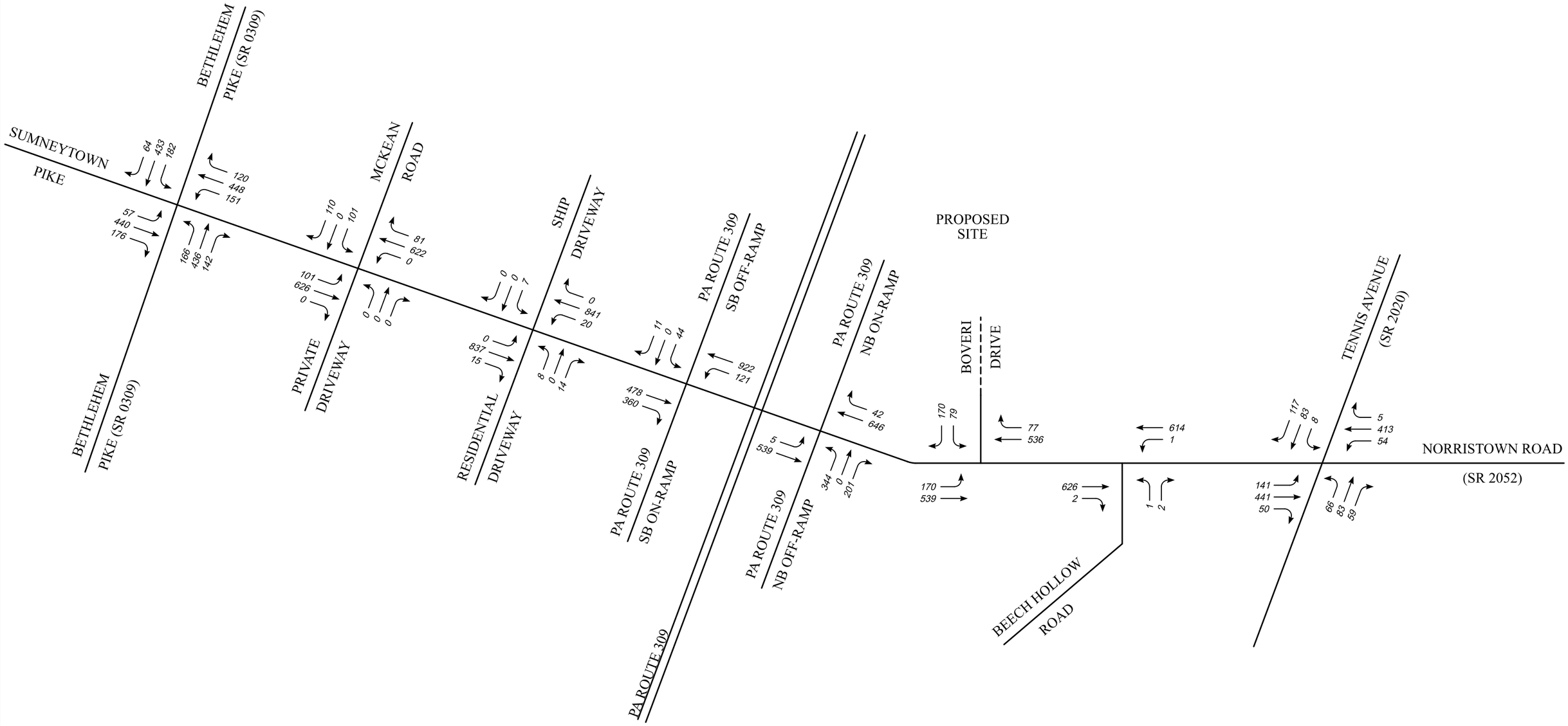
FIGURE 22

2027 PROJECTED CONDITIONS
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

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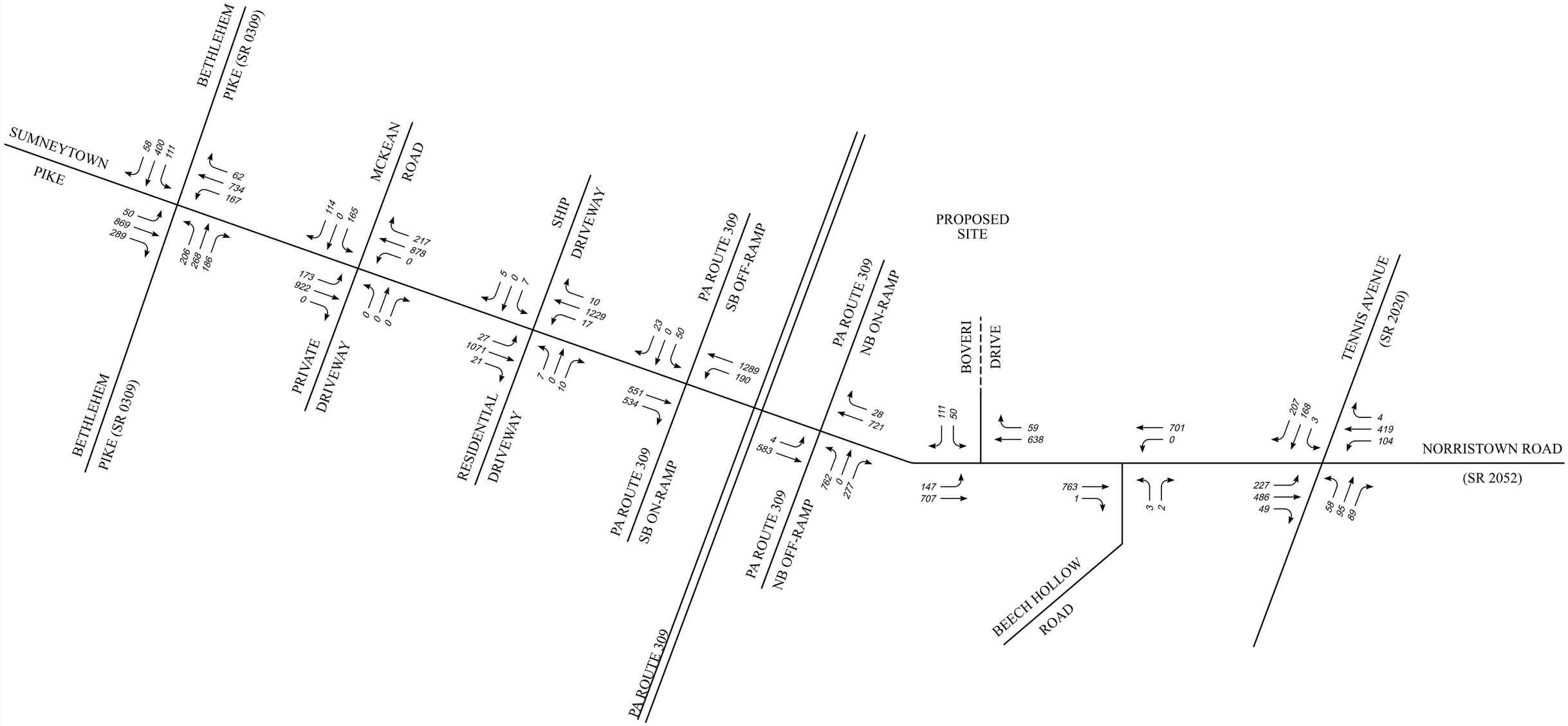
FIGURE 23

2027 PROJECTED CONDITIONS
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

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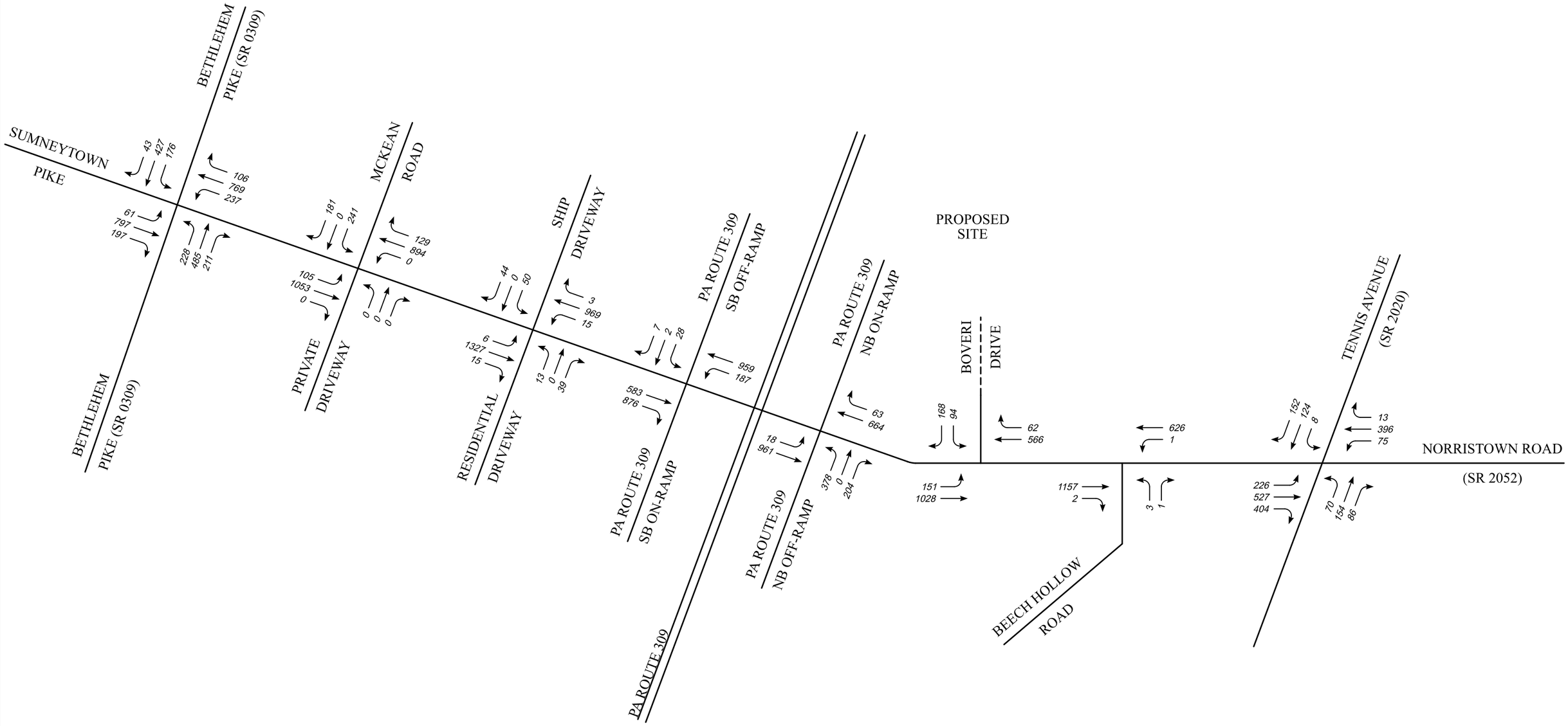
FIGURE 24

2032 PROJECTED CONDITIONS WITHOUT SHIP
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

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FIGURE 25

2032 PROJECTED CONDITIONS WITHOUT SHIP
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES

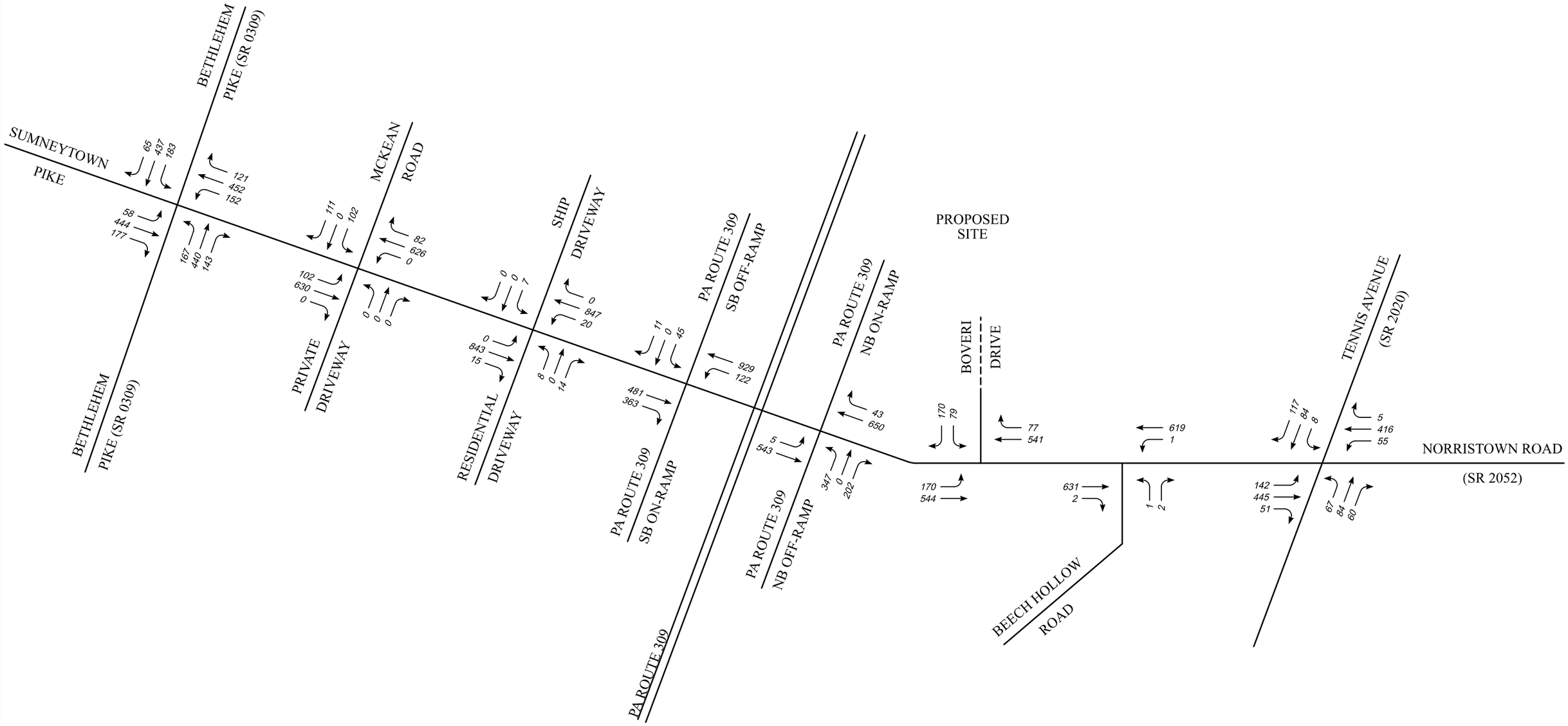


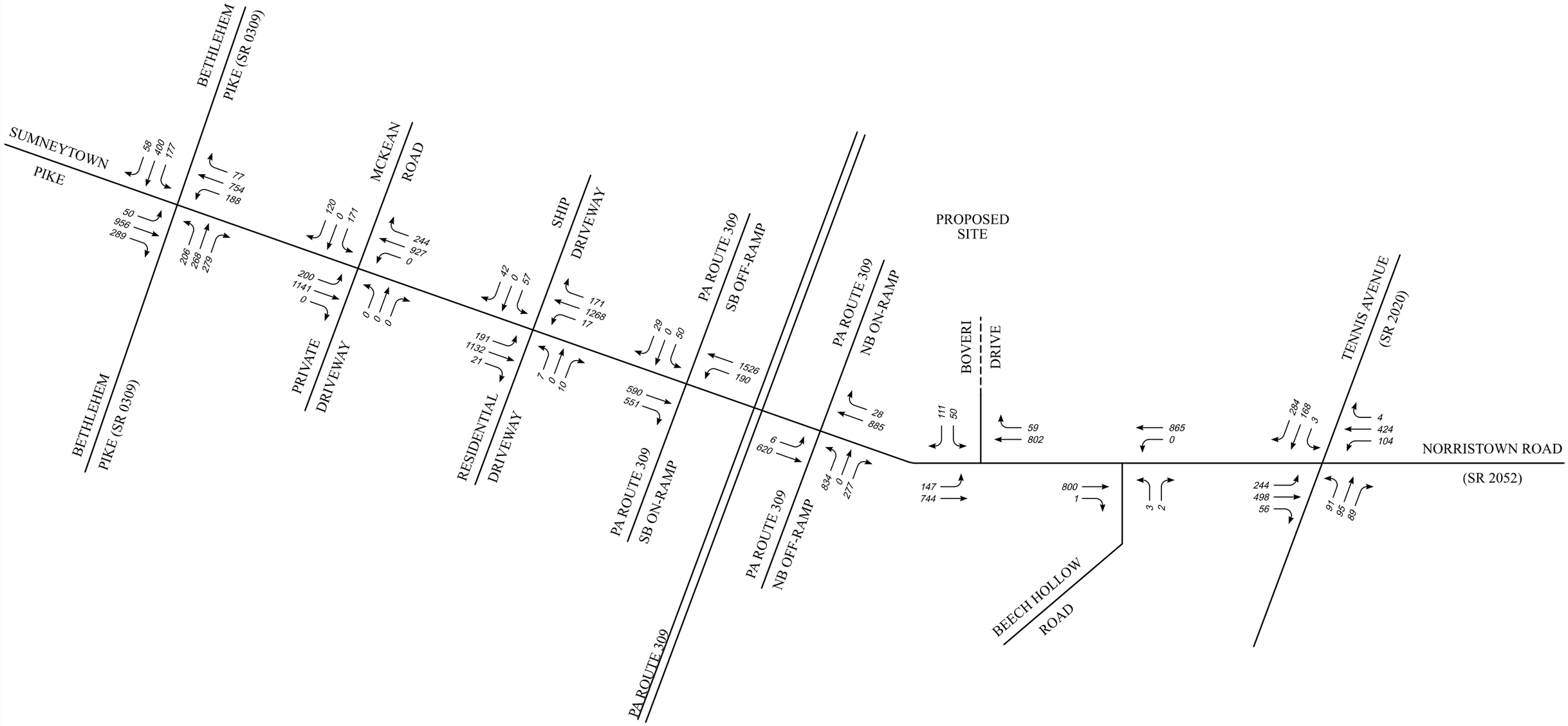
FIGURE 26

2032 PROJECTED CONDITIONS WITHOUT SHIP
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES

KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE



KEY:

– – – – – PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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FIGURE 27

2032 PROJECTED CONDITIONS WITH SHIP
WEEKDAY A.M. PEAK HOUR
TRAFFIC VOLUMES

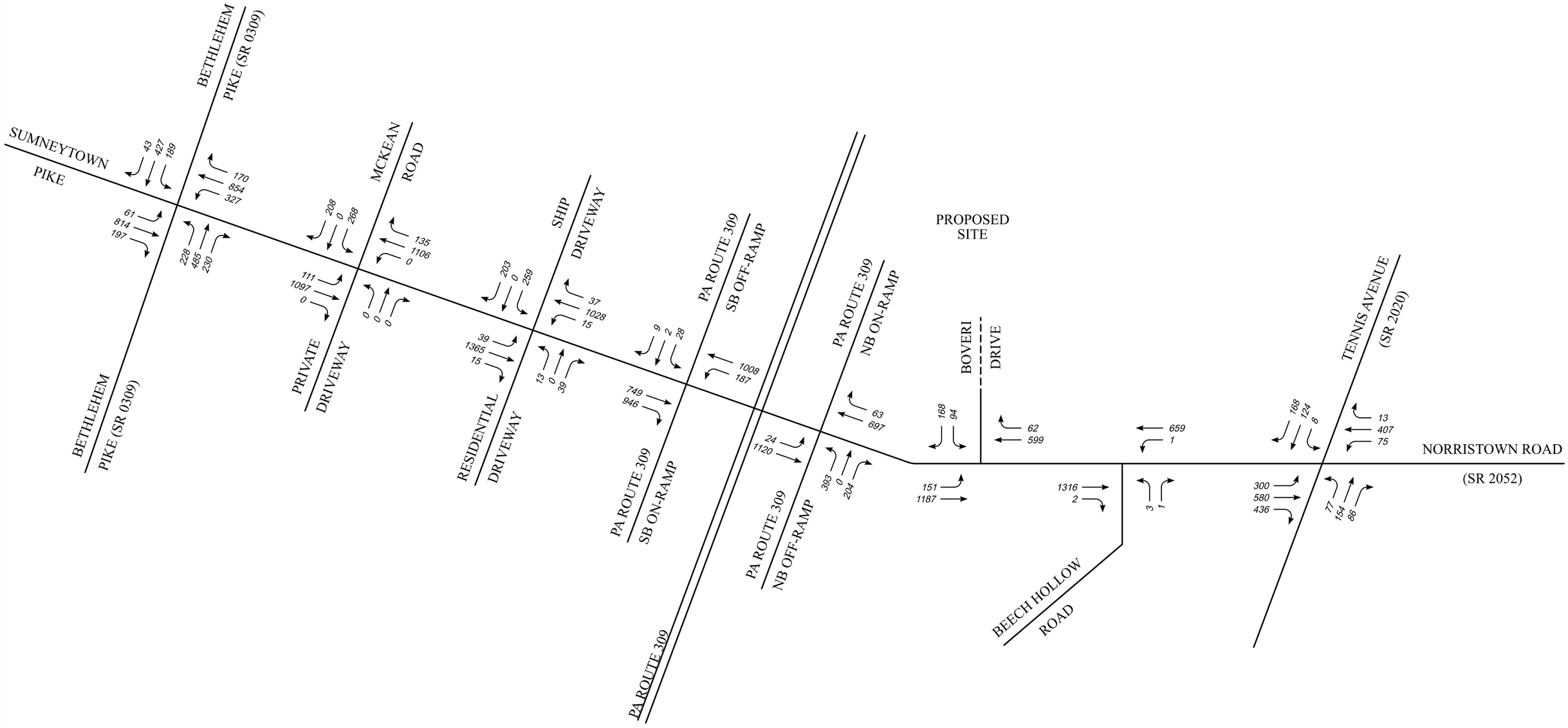


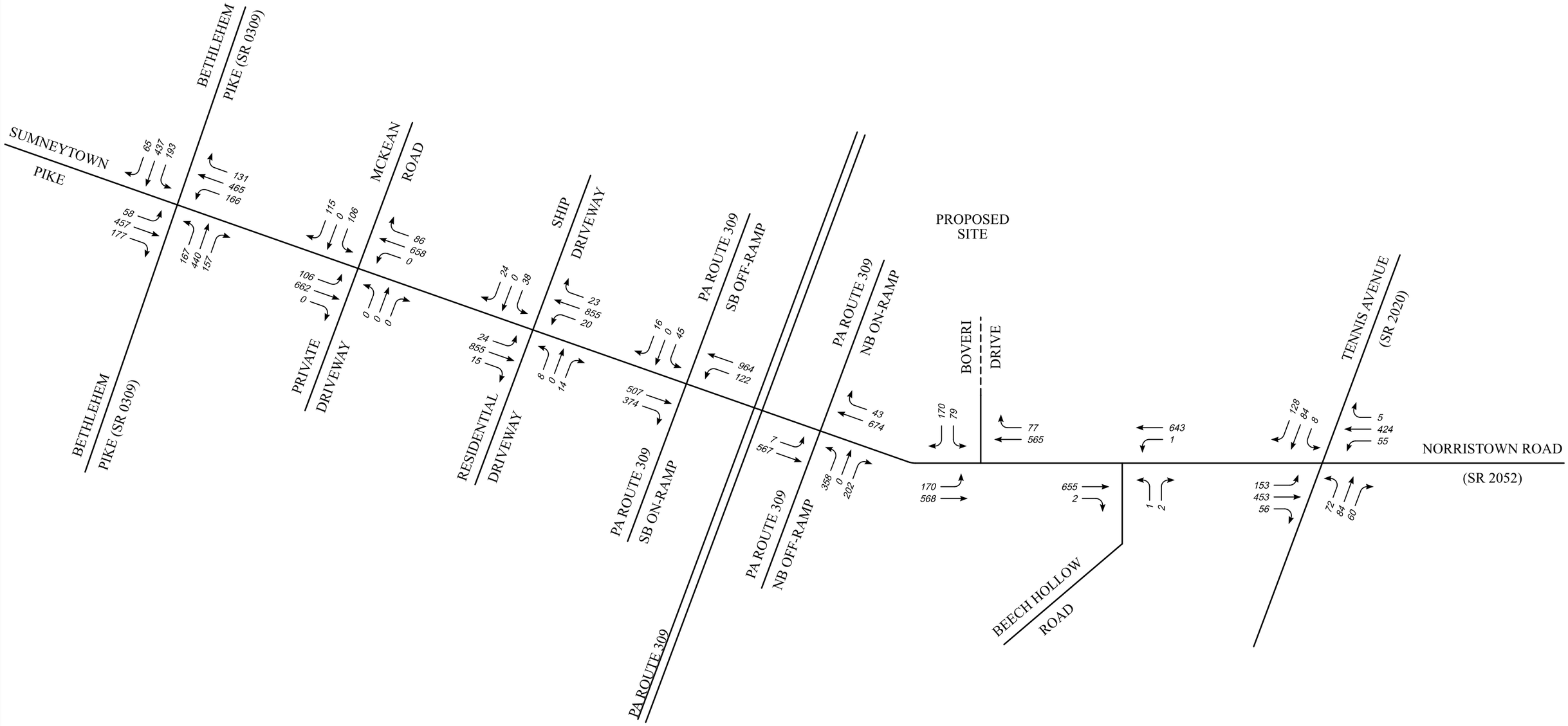
FIGURE 28

2032 PROJECTED CONDITIONS WITH SHIP
WEEKDAY P.M. PEAK HOUR
TRAFFIC VOLUMES

KEY:

– – – – – PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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FIGURE 29

2032 PROJECTED CONDITIONS WITH SHIP
MIDDAY SATURDAY PEAK HOUR
TRAFFIC VOLUMES

APPENDIX A:

Project Correspondence

Bowman

June 26, 2025

Ms. Mimi Gleason
Township Manager
Lower Gwynedd Township
1130 N. Bethlehem Pike
Spring House, PA 19477

RE: **Traffic Review #1 – Transportation Impact Study**
321 Norristown Road (S.R. 2052) - Springhouse Mixed-Use Development
Lower Gwynedd Township, Montgomery County, PA
Project No. 314087-01-005

Dear Mimi:

As requested, on behalf of Lower Gwynedd Township, Bowman Consulting Group (Bowman) has completed our initial traffic engineering review of the proposed mixed-use development to be located at 321 Norristown Road (S.R. 2052) in Lower Gwynedd Township, Montgomery County, PA. Based on information provided in the submission, the proposed development will consist of 278 mid-rise apartments, 77,619 square feet of office space, a 30,750 square-foot grocery store, and 16,000 square feet of general retail space. Access to the site will continue to be provided via the existing signalized full-movement driveway (Boveri Drive) along Norristown Road (S.R. 2052).

The following document was reviewed in preparation of our review:

- Transportation Impact Study – Springhouse Mixed-Use Development, prepared by TPD, Inc., dated March 18, 2025.

As requested by the Township, the Transportation Impact Study (TIS) was prepared in conjunction with a proposed zoning ordinance text amendment proposed by the applicant. Based on our review of the submitted document noted above, Bowman offers the following comments for consideration by the Township and action by the applicant.

General

1. Based on our review, the applicant should address the comments contained herein and provide a revised study to the Township and our office for further review and recommendations. The applicant's engineer must provide a response letter that describes how each specific review comment has been addressed, where each can be found in the study or materials, as opposed to general responses. This will aid in the detailed review and subsequent review timeframes.

2. The proposed development will be subject to the transportation impact fee of $3,865 per "new" weekday afternoon peak hour trip and the applicant will be required to pay a Transportation Impact Fee. Please note that the number of "new" trips generated during the weekday afternoon peak hour may change based on modifications to the trip generation shown in Table 6 per comment #12 of this letter and any future changes to the scope of the proposed development including the number of residential units, the type of non-residential uses, and the square footage of the non-

residential uses. In addition, the study provides information on the trip generation for the existing office space on-site that is currently vacant. Since the Springhouse Corporate Center was developed prior to the Township's transportation impact fee, the applicant may be entitled to a credit towards the impact fee assessment for the existing uses on the site. If the proposed development moves forward to the conditional use/land development phase, the transportation impact fee will be calculated at that time.

3. Since Norristown Road (S.R. 2052) is a state roadway, a Highway Occupancy Permit (HOP) will be required for any modifications within the legal right-of-way along Norristown Road (S.R. 2052). The Township and our office must be copied on all plan submissions and correspondence between the applicant and PennDOT and invited to any and all meetings between these parties.

Transportation Impact Study

4. Since access to this site is provided via Norristown Road (S.R. 2052), which is a state roadway, the transportation impact study (TIS) should be concurrently reviewed by PennDOT at the appropriate time during the land development process to obtain concurrence and approvals on the access and associated improvements proposed in the study. Any comments from PennDOT are requested to also be coordinated with/copied to our office and Lower Gwynedd Township.

5. The applicant's traffic engineer concludes that under the 2027 and 2032 projected conditions, with the development of the proposed site, and with the site-related recommendations outlined in Table II of the Executive summary of the TIS, all study area intersections will satisfy PennDOT ILOS Standards. The study presents the following recommendations/conclusions (bullet items below), that should minimally be required of the applicant as we note after each, and of which will also be reviewed by PennDOT. In addition, we have provided recommendations for additional improvements that should be further considered and evaluated by the applicant, Township, and PennDOT.

Norristown Road (S.R. 2052) Corridor

- Optimize traffic signal timings at the signalized study intersections.

PennDOT TIS guidelines state if the evaluation of the With Development Horizon Year Scenario to the Without Development Horizon Year Scenario indicates that the overall intersection level of service has dropped, the applicant will be required to mitigate the level of service if the increase in overall intersection delay is greater than 10-seconds. If the overall intersection delay increase is less than or equal to 10-seconds, mitigation of the intersection will not be required. It should be noted that the proposed traffic signal timing optimization at the signalized intersections along Norristown Road (S.R. 2052) from Bethlehem Pike (S.R. 2018) to Tennis Avenue (S.R. 2020) are expected to mitigate the overall intersection level of service (LOS) impacts of the proposed development according to current PennDOT criteria.

Norristown Road (S.R. 2052) Site Access (Boveri Drive)

- Restripe the eastbound left-turn lane to increase the storage length to 275 feet.
- Maintenance of on-site vegetation to maximize available sight distance.

According to the turn lane warrant analysis summarized in Table 16, a 175-foot right-turn lane is warranted along the westbound Norristown Road (S.R. 2052) approach to Boveri Drive. Based on information provided in the study, the applicant is not proposing to install this right-turn lane due to steep grades adjacent to Norristown Road (S.R. 2052) and the existing walking trail along Norristown Road (S.R. 2052). It should be noted that the westbound Norristown Road (S.R. 2052) approach to Boveri Drive is expected to operate at LOS A during all three peak hours under 2027 and 2032 future projected conditions. The Township and the applicant should further evaluate the impacts to the existing features along the north side of Norristown Road (S.R. 2052) from widening Norristown Road (S.R. 2052) and relocating the trail to provide the right-turn lane and review with PennDOT during the land development and HOP review process.

In addition to the improvements proposed for the site access listed above, we recommend the Boveri Drive approach to Norristown Road (S.R. 2052) be widened to extend the right-turn lane to begin at a point near the first internal intersection to better accommodate projected queues on the Boveri Drive approach to Norristown Road (S.R. 2052). If the proposed development moves forward to the land development process, we recommend that a review of the traffic signal equipment be completed for the Boveri Drive intersection to determine upgrades that may be required for compliance with the current township traffic signal specifications.

The existing signalized site access is projected to satisfy PennDOT's LOS criteria. Based on the projected operation of the signalized site access provided in the traffic study, a second vehicular site access is not needed along Norristown Road (S.R. 2052) to meet PennDOT LOS criteria. Additional vehicular access points along Norristown Road (S.R. 2052) between Boveri Drive and the northbound Route 309 ramps would not be consistent with best access management practices. As requested, the applicant has proposed an emergency access only driveway on Norristown Road (S.R. 2052). Our office does not object to an emergency access only along Norristown Road (S.R. 2052), however we defer to the Township Fire Marshal and PennDOT on the most appropriate location of the proposed emergency access only driveway.

Norristown Road (S.R. 2052) Site Frontage

- Provide a 10-foot-wide trail along the Norristown Road (S.R. 2052) site frontage. In addition, provide a 10-foot-wide trail through portions of the site that connects to the proposed trail along the Norristown Road (S.R. 2052) site frontage and to the existing trail to the east of the site.
- Provide sidewalk extending across the Route 309 northbound on-ramp, under Route 309, across the Route 309 southbound off-ramp terminating at/near the SHIP property to the west of the site.
- Provide PennDOT compliant crosswalks and pedestrian traffic signal equipment at the signalized study intersections between Boveri Drive and the Route 309 southbound off-ramp.

We recommend the applicant submit a concept plan for review by the Township showing the proposed sidewalk and lane configurations on Norristown Road (S.R. 2052) through the entire Route 309 interchange area.

In addition to the improvements proposed for the Norristown Road (S.R. 2052) site frontage and Route 309 interchange listed above, we recommend the existing loop detection system for the Route 309 interchange traffic signals be replaced with a detection system that is consistent with the current Township traffic signal specifications in order to further optimize traffic flow through the interchange area. Additional traffic signal upgrades may be identified when a review of the design plans is completed for the proposed improvements.

6. PennDOT TIS guidelines state that applicants may be required to address available storage and queue lengths at critical movements or approaches even if the overall intersection LOS requirements are met. The applicant's engineer should evaluate feasible improvements at the intersection of Norristown Road (S.R. 2052) and Tennis Avenue (S.R. 2020) to accommodate the 2027 and 2032 future projected queues that are projected to exceed the available storage length for the eastbound left-turn movement on Norristown Road (S.R. 2052) during the weekday morning and weekday afternoon peak hours according to the queue analysis provided in Tables 13 to 15 of the TIS.

   We recommend that the applicant evaluate the feasibility of utilizing the existing paved width of Norristown Road (S.R. 2052) utilizing the existing shoulders (with minor widening if needed) to restripe the roadway to provide a longer eastbound left-turn lane to accommodate the projected queue noted above and maintain the two existing westbound through lanes creating a consistent 5-lane cross section for much of the segment between Tennis Avenue (S.R. 2020) and Boveri Drive. In addition, we recommend that a review of the traffic signal equipment be completed during the land development process for the Norristown Road (S.R. 2052)/Tennis Avenue (S.R. 2020) intersection to determine upgrades that may be needed for compliance with the existing township traffic signal specifications.

   If improvements to address available storage and queue lengths at critical movements or approaches are not feasible, the applicant may be required by PennDOT to provide an Alternative Transportation Plan (ATP) that proposes necessary storage and/or infrastructure improvements in the study area that are feasible and will improve transportation (multi-modal) mobility. Additional comments regarding queuing at study intersections and potential improvements may follow in subsequent reviews after the traffic analysis comments in this letter have been addressed.

7. In future submissions of the TIS, the applicant's traffic engineer should evaluate additional traffic signal timing adjustments to reduce the eastbound through movement queues for Sumneytown Pike at its intersection with Bethlehem Pike (S.R. 2018).

8. The residents located along Beech Hollow Road raised concerns at the January 2025 community meeting about the difficulty of making a left-turn from Beech Hollow Road onto Norristown Road (S.R. 2052), which could potentially be exacerbated by the proposed development. The separation distance between the Beech Hollow Road intersection and the existing traffic signal at Boveri Drive must be taken into consideration for the feasibility of lane improvements or traffic signal modifications. Any improvements to Norristown Road (S.R. 2052) or modifications to the existing traffic signal would require PennDOT approval. The applicant and Township should discuss any potential improvements to the Norristown Road (S.R. 2052)/Beech Hollow Road intersection with PennDOT at the time the applicant would initiate the PennDOT HOP review process.

9. The study includes traffic and associated roadway improvements from the potential development at the Springhouse Innovation Park (SHIP) in the 2032 future base and projected conditions. The proposed improvements for SHIP include the following:

    - Provide a separate westbound right-turn lane on Norristown Road (S.R. 2052) at the SHIP signalized driveway intersection.
    - Provide a separate eastbound left-turn lane on Norristown Road (S.R. 2052) at the McKean Road and SHIP intersections.
    - Provide a 5-lane cross section with a two-way center left turn lane on Norristown Road (S.R. 2052) between the Route 309 interchange and project limits for the recently completed Spring House Intersection Improvements Project.

    Due to the uncertainty of the potential development on the SHIP property, the study should also include an analysis scenario for 2032 future base and projected conditions that does not include traffic and associated roadway improvements from the potential SHIP development.

10. Based on information provided in Table 6 of the TIS, the proposed development will generate 338 total "new" trips during the weekday morning peak hour, 405 total "new" trips during the weekday afternoon peak hour, and 401 total "new" trips during the Saturday midday peak hour. The table below summarizes the "new" trips for the proposed development.

Total "New" Trips
Proposed Site

Land Uses	Size	AM Peak	PM Peak	Saturday Midday Peak
Office (Existing to Remain)	77,619 s.f.	124	108	35
Proposed Residential	278 units	108	57	81
Proposed Retail Buildings	46,750 s.f.	106	240	285
Total New Trips		338	405	401

The existing site consists of a 143,295 square-foot office building which if fully occupied would generate 228 total "new" trips during the weekday morning peak hour, 224 total "new" trips during the weekday afternoon peak hour, and 76 total "new" trips during the Saturday midday peak hour. Therefore, the proposed development is expected to generate an additional 110 total "new" trips during the weekday morning peak hour, an additional 181 total "new" trips during the weekday afternoon peak hour, and an additional 325 total "new" trips during the Saturday midday peak hour over the existing office buildings of the site if fully occupied.

It is noted that the above "new" trip calculations exclude retail pass-by trips and trips generated by the interaction between the proposed land uses on the site, because they are not considered "new" trips added to the surrounding road network. Please note that the number of "new" trips generated during the weekday morning, weekday afternoon, and Saturday midday peak hours may change based on modifications to the trip generation shown in Table 6 of the TIS per comment #11 of this letter and any future changes to the scope of the proposed development including the number of residential units, the type of non-residential uses, and the square footage of the non-residential uses. If the Township is interested in considering additional development scenarios for the site such as the number of residential units or square footage of retail, or land uses that differ from the

current development proposal, the applicant's traffic engineer should provide a revised trip generation analysis.

11. As indicated in comment #10 above, the proposed development is expected to generate 338 total "new" trips during the weekday morning peak hour, 405 total "new" trips during the weekday afternoon peak hour, and 401 total "new" trips during the Saturday midday peak hour which equates to the following approximate increases in existing peak hour traffic volumes at the following locations:

	AM Peak	PM Peak	Saturday Midday Peak
Sumneytown Pike (to/from West)	3.2%	4.0%	6.4%
Norristown Road (to/from East)	3.8%	4.7%	5.2%
Bethlehem Pike (to/from South)	4.0%	4.0%	4.7%
Bethlehem Pike (to/from North)	4.9%	4.3%	4.2%
Route 309 Ramps (to/from South)	3.1%	4.0%	6.7%
Route 309 Ramps (to/from North)	7.2%	7.3%	8.5%
Tennis Avenue (to/from South)	4.4%	3.3%	7.8%
Tennis Avenue (to/from North)	3.4%	4.4%	6.6%
McKean Road (to/from North)	3.1%	3.8%	6.5%
Norristown Road (between McKean Road and Bethlehem Pike)	8.7%	9.6%	15.5%
Norristown Road (between McKean Road and Route 309)	8.8%	10.3%	15.0%
Norristown Road (between Boveri Drive and Tennis Avenue)	6.4%	6.3%	9.1%

12. The total trips for the retail portion of the site shown in Table 6 of the TIS for the daily, the weekday morning peak hour, the weekday afternoon peak hour, and the Saturday midday peak hour do not match what the trip generation for the daily, the weekday morning peak hour, the weekday afternoon peak hour, and the Saturday midday peak hour should be based on the rates and equations shown in Table 5 which are based on the data contained in the Institute of Transportation Engineers publication, *Trip Generation, 11th Edition*. The trip generation shown in Table 6 should be revised accordingly.

13. The residential portion of the development was previously proposed to consist of 350 apartment units. However, based on information provided in the study, the residential portion of the development will now consist of 72 fewer apartment units than previously proposed, for a total of 278 apartment units. The 72 apartment units would be expected to generate 333 total daily trips, 30 total trips during the weekday morning peak hour, 27 total trips during the weekday afternoon peak hour, and 32 total trips during the Saturday midday peak hour.

14. Based on information provided in Table 6 of the study, trips for the proposed grocery store and retail uses of the site were generated using Land Use Code 821 (Shopping Plaza (40-150K) with Supermarket) which results in a calculation of more vehicle trips than calculating the trips for the proposed grocery store and retail uses of the site separately using Land Use Code 850

(Supermarket) and Land Use Code 821(Shopping Plaza (40-150K) without Supermarket). Our office concurs with the trip generation methodology used to calculate the trip generation for the grocery store/retail portion of the site.

15. The internal trip calculation worksheets for the daily trips and the Saturday midday peak hour should be provided in subsequent submissions in order to confirm the internal trips shown in Table 6.

16. The pass-by trips shown on Figures 15 to 17 should be balanced between the study intersections. Revise all applicable figures and analyses accordingly.

17. The storage length for the westbound left-turn lane on Norristown Road (S.R. 2052) at the intersection with Bethlehem Pike (S.R. 2018) exceeds 600 feet in length. In addition, the storage length for the eastbound right-turn lane on Sumneytown Pike at Bethlehem Pike (S.R. 2018) is approximately 305 feet. Revise the analysis and Table 13 accordingly.

18. The applicant's traffic engineer should confirm that the lost time adjustment factors for the following signalized intersections are consistent with **PennDOT Publication 46, Chapter 10** parameters under all analysis conditions.

    - Norristown Road (S.R. 2052) and Route 309 Southbound Ramps.
    - Norristown Road (S.R. 2052) and SHIP Driveway/Residential Driveway.
    - Norristown Road (S.R. 2052) and McKean Road.

19. Crash resumes should be provided to our office and PennDOT during the land development and HOP process in order for the crashes summarized in the study at the intersection of Norristown Road (S.R. 2052) and Route 309 Northbound Ramps can be further evaluated. The evaluation may help determine if there is a pattern to the crashes at this intersection and if the provision of safety improvements may benefit this intersection and reduce the types of crashes that are occurring there. The applicant's review of the same should indicate their recommendation, as well.

20. If the Township is interested in considering additional development scenarios for the site such as the number of residential units or square footage of retail, or land uses that differ from the current development proposal, the applicant's traffic engineer should provide an updated traffic study to evaluate the impacts and identify potential transportation improvements.

21. If the proposed development is approved and constructed, we recommend that the applicant complete a post-development trip generation study after the development is completely constructed and fully occupied to determine if additional traffic analysis at any of the study intersections should be completed to determine if further mitigation should be required of the applicant.

We trust that this review letter responds to your request and satisfactorily addresses the traffic issues that are related to the proposed development apparent to us at this time. If you or the Township have any questions, or require clarification, please contact me.

Sincerely,

Chad Dixson, AICP, PP
Senior Project Manager

CED/BMJ

cc: Jamie Worman, Assistant Township Manager
James Hersh, P.E., Gilmore & Associates, Inc.
Neil Stein, Esquire, Solicitor
Peter Clelland, BT 309, LLC (Applicant)
Matt Hammond, P.E., TPD, Inc. (Applicant's Traffic Engineer)

V:\314087 - Lower Gwynedd Township\314087-01-005 (TRA) - BET 321 NorristownRd\Engineering\Submissions\2025-03-19 TIS\Review\2025-06-26 Review #1 - BET Springhouse.docx

APPENDIX B:

Study Area Photographs

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Boveri Drive & Norristown Road*

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Boveri Drive & Norristown Road*

Direction / Road: **Wb.** ***Norristown Road***

Approach / Departure: Approach

Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***

Approach / Departure: Approach

Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Boveri Drive & Norristown Road*

Direction / Road: **Sb.** ***Boveri Drive***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Sb.** ***Boveri Drive***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Beech Hollow Road & Norristown Road*

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Beech Hollow Road & Norristown Road*

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Beech Hollow Road & Norristown Road*

Direction / Road: **Nb.** ***Beech Hollow Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Nb.** ***Beech Hollow Road Drive***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *NB Route 309 Ramps & Norristown Road*

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *NB Route 309 Ramps & Norristown Road*

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *NB Route 309 Ramps & Norristown Road*

Direction / Road: **Nb.** ***NB Route 309 Ramps***

Approach / Departure: Approach

Distance: 50 feet

Direction / Road: **Nb.** ***NB Route 309 Ramps***

Approach / Departure: Approach

Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SB Route 309 Ramps & Norristown Road*

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SB Route 309 Ramps & Norristown Road*

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SB Route 309 Ramps & Norristown Road*

Direction / Road: **Sb.** ***SB Route 309 Ramps***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Sb.** ***SB Route 309 Ramps***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Tennis Drive & Norristown Road*

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Tennis Drive & Norristown Road*

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Tennis Drive & Norristown Road*

Direction / Road: **Nb. *Tennis Drive***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Nb. *Tennis Drive***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *Tennis Drive & Norristown Road*

Direction / Road: **Sb.** ***Tennis Drive***

Approach / Departure: Approach

Distance: 50 feet

Direction / Road: **Sb.** ***Tennis Drive***

Approach / Departure: Approach

Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SHIP Driveway-Spring House Estate & Norristown Rd*

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SHIP Driveway-Spring House Estate & Norristown Rd*

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SHIP Driveway-Spring House Estate & Norristown Rd*

Direction / Road: **Nb.** ***Spring House Estates***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Nb.** ***Spring House Estates***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *10-26-2024* *Intersection Of:* *SHIP Driveway-Spring House Estate & Norristown Rd*

Direction / Road: **Sb.** ***SHIP Driveway***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Sb.** ***SHIP Driveway***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *McKean Road & Norristown Road*

Direction / Road: **Eb.** ***Norristown Road***

Approach / Departure: Approach

Distance: 50 feet

Direction / Road: **Eb.** ***Norristown Road***

Approach / Departure: Approach

Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *McKean Road & Norristown Road*

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *McKean Road & Norristown Road*

Direction / Road: **Sb.** ***McKean Road***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Sb.** ***McKean Road***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *Bethlehem Pike & Norristown Road-Sumneytown Pike*

Direction / Road: **Eb. *Sumneytown Pike***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Eb. *Sumneytown Pike***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *Bethlehem Pike & Norristown Road-Sumneytown Pike*

Direction / Road: **Wb.** ***Norristown Road***

Approach / Departure: Approach

Distance: 50 feet

Direction / Road: **Wb.** ***Norristown Road***

Approach / Departure: Approach

Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *Bethlehem Pike & Norristown Road-Sumneytown Pike*

Direction / Road: **Nb. *Bethlehem Pike***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Nb. *Bethlehem Pike***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *BETI.00012* *Date Taken:* *02-12-2025* *Intersection Of:* *Bethlehem Pike & Norristown Road-Sumneytown Pike*

Direction / Road: **Sb.** ***Bethlehem Pike***
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Sb.** ***Bethlehem Pike***
Approach / Departure: Approach
Distance: 200 Feet

APPENDIX C:

Manual Traffic Count Printouts

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 1

Turning Movement Data

Start Time	Norristown Road Eastbound				Norristown Road Westbound						Boveri Drive Southbound					
	Left	Thru	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
6:00 AM	0	50	0	50	0	70	0	0	0	70	0	0	0	0	0	120
6:15 AM	1	72	0	73	0	84	0	0	0	84	0	0	0	0	0	157
6:30 AM	0	106	0	106	0	86	5	0	0	91	0	0	1	0	1	198
6:45 AM	0	140	0	140	0	131	1	0	0	132	0	0	0	0	0	272
Hourly Total	1	368	0	369	0	371	6	0	0	377	0	0	1	0	1	747
7:00 AM	3	122	0	125	0	133	0	0	0	133	1	0	1	0	2	260
7:15 AM	2	129	0	131	0	143	1	0	0	144	0	0	0	0	0	275
7:30 AM	0	171	0	171	0	184	0	0	0	184	0	0	0	0	0	355
7:45 AM	2	173	0	175	0	177	4	0	0	181	0	0	1	0	1	357
Hourly Total	7	595	0	602	0	637	5	0	0	642	1	0	2	0	3	1247
8:00 AM	2	195	0	197	0	140	3	0	0	143	0	1	0	0	1	341
8:15 AM	4	173	0	177	0	141	1	0	0	142	1	0	0	0	1	320
8:30 AM	5	176	0	181	0	131	1	0	0	132	0	0	0	0	0	313
8:45 AM	7	184	0	191	0	155	2	0	0	157	0	1	0	0	1	349
Hourly Total	18	728	0	746	0	567	7	0	0	574	1	2	0	0	3	1323
9:00 AM	1	139	0	140	0	128	2	0	0	130	1	0	0	0	1	271
9:15 AM	0	150	0	150	0	133	2	0	0	135	0	0	0	0	0	285
9:30 AM	2	142	0	144	0	120	2	0	0	122	1	0	3	0	4	270
9:45 AM	0	121	0	121	0	137	1	0	0	138	0	0	0	0	0	259
Hourly Total	3	552	0	555	0	518	7	0	0	525	2	0	3	0	5	1085
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	315	0	316	0	131	0	0	0	131	1	0	2	0	3	450
3:15 PM	5	384	0	389	0	129	0	0	0	129	1	0	4	0	5	523
3:30 PM	1	196	0	197	0	160	0	0	0	160	0	0	1	0	1	358
3:45 PM	0	163	0	163	0	162	0	0	0	162	0	0	1	0	1	326
Hourly Total	7	1058	0	1065	0	582	0	0	0	582	2	0	8	0	10	1657
4:00 PM	2	177	0	179	0	133	1	0	0	134	1	1	0	0	2	315
4:15 PM	0	167	0	167	0	184	0	0	0	184	2	0	1	0	3	354
4:30 PM	0	194	0	194	0	160	1	0	0	161	0	0	0	0	0	355
4:45 PM	2	173	0	175	0	169	0	0	0	169	0	0	4	0	4	348
Hourly Total	4	711	0	715	0	646	2	0	0	648	3	1	5	0	9	1372
5:00 PM	1	156	0	157	0	161	0	0	0	161	1	1	2	0	4	322
5:15 PM	1	167	0	168	0	148	0	0	0	148	3	1	1	0	5	321
5:30 PM	0	198	0	198	0	145	1	0	0	146	2	1	2	0	5	349
5:45 PM	1	197	0	198	0	143	0	0	0	143	4	0	0	0	4	345
Hourly Total	3	718	0	721	0	597	1	0	0	598	10	3	5	0	18	1337
6:00 PM	0	168	0	168	1	130	0	0	0	131	0	0	0	0	0	299
6:15 PM	0	161	0	161	1	121	0	0	0	122	1	0	1	0	2	285
6:30 PM	2	128	0	130	0	83	0	0	0	83	0	0	0	0	0	213
6:45 PM	0	123	0	123	0	84	1	0	0	85	1	0	2	0	3	211
Hourly Total	2	580	0	582	2	418	1	0	0	421	2	0	3	0	5	1008
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	0	114	0	114	0	89	0	0	0	89	0	0	0	0	0	203
10:15 AM	0	76	0	76	0	110	0	0	0	110	0	0	0	0	0	186
10:30 AM	0	134	0	134	0	115	1	0	0	116	0	0	0	0	0	250
10:45 AM	0	135	0	135	0	98	0	0	0	98	0	0	0	0	0	233
Hourly Total	0	459	0	459	0	412	1	0	0	413	0	0	0	0	0	872
11:00 AM	0	128	0	128	0	116	0	0	0	116	0	0	0	0	0	244
11:15 AM	0	140	0	140	0	104	0	0	0	104	0	0	0	0	0	244
11:30 AM	0	114	0	114	0	112	0	0	0	112	0	0	0	0	0	226
11:45 AM	0	134	0	134	0	100	0	0	0	100	0	0	0	0	0	234
Hourly Total	0	516	0	516	0	432	0	0	0	432	0	0	0	0	0	948
12:00 PM	0	154	0	154	0	125	0	0	0	125	0	0	0	0	0	279
12:15 PM	2	124	0	126	0	139	0	0	0	139	0	0	1	0	1	266
12:30 PM	0	132	0	132	0	141	1	0	0	142	2	0	0	0	2	276
12:45 PM	0	161	0	161	0	137	0	0	0	137	0	0	0	0	0	298
Hourly Total	2	571	0	573	0	542	1	0	0	543	2	0	1	0	3	1119
1:00 PM	0	148	0	148	0	144	0	0	0	144	0	0	0	0	0	292
1:15 PM	0	158	0	158	0	108	0	0	0	108	0	0	0	0	0	266
1:30 PM	0	120	0	120	0	129	1	0	0	130	0	0	0	0	0	250

1:45 PM	0	139	0	139	0	128	0	0	0	128	1	0	0	0	1	268
Hourly Total	0	565	0	565	0	509	1	0	0	510	1	0	0	0	1	1076
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	47	7421	0	7468	2	6231	32	0	0	6265	24	6	28	0	58	13791
Approach %	0.6	99.4	-	-	0.0	99.5	0.5	0.0	-	-	41.4	10.3	48.3	-	-	-
Total %	0.3	53.8	-	54.2	0.0	45.2	0.2	0.0	-	45.4	0.2	0.0	0.2	-	0.4	-
Lights	45	7268	-	7313	2	6132	28	0	-	6162	22	6	24	-	52	13527
% Lights	95.7	97.9	-	97.9	100.0	98.4	87.5	-	-	98.4	91.7	100.0	85.7	-	89.7	98.1
Other Vehicles	2	153	-	155	0	99	4	0	-	103	2	0	4	-	6	264
% Other Vehicles	4.3	2.1	-	2.1	0.0	1.6	12.5	-	-	1.6	8.3	0.0	14.3	-	10.3	1.9
Pedestrians	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 3

Boveri Drive [SB]		
Out	In	Total
73	52	125
6	6	12
0	0	0
79	**58**	**137**

30	22	0
4	2	0
0	0	0
34	**24**	**0**
R	L	P

Norristown Road [EB]		
Out	In	Total
6162	7313	13475
103	155	258
0	0	0
6265	**7468**	**13733**

0	7268	45
0	153	2
0	0	0
0	**7421**	**47**
P	T	L

10/24/2024 6:00 AM
Ending At
10/26/2024 2:15 PM

Lights
Other Vehicles
Pedestrians

Norristown Road [WB]		
Out	In	Total
7290	6162	13452
155	103	258
0	0	0
7445	**6265**	**13710**

28	6132	2
4	99	0
0	0	0
32	**6231**	**2**
R	T	L

0	0	0
0	0	0
0	0	0
0	**0**	**0**
P		

2	0	2
0	0	0
0	0	0
2	**0**	**2**
Out	In	Total
Fake Approach [NB]		

Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound						Boveri Drive Southbound					
	Left	Thru	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
7:30 AM	0	171	0	171	0	184	0	0	0	184	0	0	0	0	0	355
7:45 AM	2	173	0	175	0	177	4	0	0	181	0	0	1	0	1	357
8:00 AM	2	195	0	197	0	140	3	0	0	143	0	1	0	0	1	341
8:15 AM	4	173	0	177	0	141	1	0	0	142	1	0	0	0	1	320
Total	8	712	0	720	0	642	8	0	0	650	1	1	1	0	3	1373
Approach %	1.1	98.9	-	-	0.0	98.8	1.2	0.0	-	-	33.3	33.3	33.3	-	-	-
Total %	0.6	51.9	-	52.4	0.0	46.8	0.6	0.0	-	47.3	0.1	0.1	0.1	-	0.2	-
PHF	0.500	0.913	-	0.914	0.000	0.872	0.500	0.000	-	0.883	0.250	0.250	0.250	-	0.750	0.961
Lights	8	682	-	690	0	627	7	0	-	634	1	1	0	-	2	1326
% Lights	100.0	95.8	-	95.8	-	97.7	87.5	-	-	97.5	100.0	100.0	0.0	-	66.7	96.6
Other Vehicles	0	30	-	30	0	15	1	0	-	16	0	0	1	-	1	47
% Other Vehicles	0.0	4.2	-	4.2	-	2.3	12.5	-	-	2.5	0.0	0.0	100.0	-	33.3	3.4
Pedestrians	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 5

Boveri Drive [SB]		
Out	In	Total
15	2	17
1	1	2
0	0	0
16	**3**	**19**

1	1	0
1	0	0
0	0	0
2	**1**	**0**
R	L	P

Norristown Road [EB]		
Out	In	Total
628	690	1318
16	30	46
0	0	0
644	**720**	**1364**

0	682	8
0	30	0
0	0	0
0	**712**	**8**
P	T	L

Peak Hour Data

10/24/2024 7:30 AM
Ending At
10/24/2024 8:30 AM

Lights
Other Vehicles
Pedestrians

P	L	T	R
0	0	0	7
0	0	15	1
0	0	0	0
0	**0**	**642**	**8**
0	0	0	R

Norristown Road [WB]		
Out	In	Total
683	634	1317
30	16	46
0	0	0
713	**650**	**1363**

0	0	0
0	0	0
0	0	0
0	**0**	**0**
Out	In	Total
Fake Approach [NB]		

Turning Movement Peak Hour Data Plot (7:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (3:00 PM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound						Boveri Drive Southbound					
	Left	Thru	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
3:00 PM	1	315	0	316	0	131	0	0	0	131	1	0	2	0	3	450
3:15 PM	5	384	0	389	0	129	0	0	0	129	1	0	4	0	5	523
3:30 PM	1	196	0	197	0	160	0	0	0	160	0	0	1	0	1	358
3:45 PM	0	163	0	163	0	162	0	0	0	162	0	0	1	0	1	326
Total	7	1058	0	1065	0	582	0	0	0	582	2	0	8	0	10	1657
Approach %	0.7	99.3	-	-	0.0	100.0	0.0	0.0	-	-	20.0	0.0	80.0	-	-	-
Total %	0.4	63.9	-	64.3	0.0	35.1	0.0	0.0	-	35.1	0.1	0.0	0.5	-	0.6	-
PHF	0.350	0.689	-	0.684	0.000	0.898	0.000	0.000	-	0.898	0.500	0.000	0.500	-	0.500	0.792
Lights	7	1038	-	1045	0	570	0	0	-	570	2	0	8	-	10	1625
% Lights	100.0	98.1	-	98.1	-	97.9	-	-	-	97.9	100.0	-	100.0	-	100.0	98.1
Other Vehicles	0	20	-	20	0	12	0	0	-	12	0	0	0	-	0	32
% Other Vehicles	0.0	1.9	-	1.9	-	2.1	-	-	-	2.1	0.0	-	0.0	-	0.0	1.9
Pedestrians	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 7

Boveri Drive [SB]		
Out	In	Total
7	10	17
0	0	0
0	0	0
7	**10**	**17**

8	2	0
0	0	0
0	0	0
8	**2**	**0**
R	L	P

Norristown Road [EB]		
Out	In	Total
578	1045	1623
12	20	32
0	0	0
590	**1065**	**1655**

0	1038	7
0	20	0
0	0	0
0	**1058**	**7**
P	T	L

Peak Hour Data

10/24/2024 3:00 PM
Ending At
10/24/2024 4:00 PM

Lights
Other Vehicles
Pedestrians

0	570	0
0	12	0
0	0	0
0	**582**	**0**
R	T	L

Norristown Road [WB]		
Out	In	Total
1040	570	1610
20	12	32
0	0	0
1060	**582**	**1642**

0	0	0
0	0	0
0	0	0
0	**0**	**0**
P		

Fake Approach [NB]		
Out	In	Total
0	**0**	**0**
0	0	0
0	0	0
0	0	0

Turning Movement Peak Hour Data Plot (3:00 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (12:15 PM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound						Boveri Drive Southbound					
	Left	Thru	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
12:15 PM	2	124	0	126	0	139	0	0	0	139	0	0	1	0	1	266
12:30 PM	0	132	0	132	0	141	1	0	0	142	2	0	0	0	2	276
12:45 PM	0	161	0	161	0	137	0	0	0	137	0	0	0	0	0	298
1:00 PM	0	148	0	148	0	144	0	0	0	144	0	0	0	0	0	292
Total	2	565	0	567	0	561	1	0	0	562	2	0	1	0	3	1132
Approach %	0.4	99.6	-	-	0.0	99.8	0.2	0.0	-	-	66.7	0.0	33.3	-	-	-
Total %	0.2	49.9	-	50.1	0.0	49.6	0.1	0.0	-	49.6	0.2	0.0	0.1	-	0.3	-
PHF	0.250	0.877	-	0.880	0.000	0.974	0.250	0.000	-	0.976	0.250	0.000	0.250	-	0.375	0.950
Lights	2	560	-	562	0	559	1	0	-	560	2	0	1	-	3	1125
% Lights	100.0	99.1	-	99.1	-	99.6	100.0	-	-	99.6	100.0	-	100.0	-	100.0	99.4
Other Vehicles	0	5	-	5	0	2	0	0	-	2	0	0	0	-	0	7
% Other Vehicles	0.0	0.9	-	0.9	-	0.4	0.0	-	-	0.4	0.0	-	0.0	-	0.0	0.6
Pedestrians	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 1 Boveri Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 9

Boveri Drive [SB]		
Out	In	Total
3	3	6
0	0	0
0	0	0
3	**3**	**6**

1	2	0
0	0	0
0	0	0
1	**2**	**0**
R	L	P

Peak Hour Data

10/26/2024 12:15 PM
Ending At
10/26/2024 1:15 PM

Lights
Other Vehicles
Pedestrians

Norristown Road [EB]		
Out	In	Total
560	562	1122
2	5	7
0	0	0
562	**567**	**1129**

0	560	2
0	5	0
0	0	0
0	**565**	**2**
P	T	L

Norristown Road [WB]		
Out	In	Total
562	560	1122
5	2	7
0	0	0
567	**562**	**1129**

1	559	0
0	2	0
0	0	0
1	**561**	**0**
R	T	L

0	0	0
0	0	0
0	0	0
0	**0**	**0**
P		

0	0	0
0	0	0
0	0	0
0	**0**	**0**
Out	In	Total
Fake Approach [NB]		

Turning Movement Peak Hour Data Plot (12:15 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 1

Turning Movement Data

Start Time	Norristown Road Eastbound				Norristown Road Westbound				Beech Hollow Road Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
6:00 AM	49	0	0	49	0	61	0	61	0	0	0	0	110
6:15 AM	67	0	0	67	0	86	0	86	0	0	0	0	153
6:30 AM	103	0	0	103	0	91	0	91	0	0	0	0	194
6:45 AM	138	0	0	138	0	125	0	125	0	0	0	0	263
Hourly Total	357	0	0	357	0	363	0	363	0	0	0	0	720
7:00 AM	122	0	0	122	0	130	0	130	0	0	0	0	252
7:15 AM	127	0	0	127	0	142	0	142	0	1	0	1	270
7:30 AM	181	0	0	181	0	181	0	181	0	0	0	0	362
7:45 AM	172	0	0	172	0	183	0	183	1	0	0	1	356
Hourly Total	602	0	0	602	0	636	0	636	1	1	0	2	1240
8:00 AM	196	0	0	196	0	143	0	143	1	0	0	1	340
8:15 AM	170	1	0	171	0	147	0	147	1	2	0	3	321
8:30 AM	182	0	0	182	1	122	0	123	0	1	0	1	306
8:45 AM	180	0	0	180	0	161	0	161	0	0	0	0	341
Hourly Total	728	1	0	729	1	573	0	574	2	3	0	5	1308
9:00 AM	149	1	0	150	0	131	0	131	1	0	0	1	282
9:15 AM	143	1	0	144	0	134	0	134	1	1	0	2	280
9:30 AM	145	0	0	145	1	117	0	118	0	0	0	0	263
9:45 AM	126	0	0	126	0	150	0	150	0	0	0	0	276
Hourly Total	563	2	0	565	1	532	0	533	2	1	0	3	1101
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	341	1	0	342	0	138	0	138	1	1	0	2	482
3:15 PM	373	1	0	374	1	126	0	127	1	0	0	1	502
3:30 PM	221	0	0	221	0	150	0	150	0	0	0	0	371
3:45 PM	159	0	0	159	0	166	0	166	1	0	0	1	326
Hourly Total	1094	2	0	1096	1	580	0	581	3	1	0	4	1681
4:00 PM	181	0	0	181	0	131	0	131	0	0	0	0	312
4:15 PM	162	0	0	162	0	184	0	184	1	0	0	1	347
4:30 PM	195	1	0	196	0	163	0	163	0	0	0	0	359
4:45 PM	165	0	0	165	1	163	0	164	0	1	0	1	330
Hourly Total	703	1	0	704	1	641	0	642	1	1	0	2	1348
5:00 PM	170	1	0	171	1	168	0	169	0	0	0	0	340
5:15 PM	171	0	0	171	0	138	0	138	0	0	0	0	309
5:30 PM	201	0	0	201	0	150	0	150	0	0	0	0	351
5:45 PM	207	0	0	207	1	153	0	154	0	0	0	0	361
Hourly Total	749	1	0	750	2	609	0	611	0	0	0	0	1361
6:00 PM	171	1	0	172	1	123	0	124	1	0	0	1	297
6:15 PM	169	2	0	171	0	123	0	123	0	1	0	1	295
6:30 PM	126	0	0	126	0	86	0	86	0	0	0	0	212
6:45 PM	118	0	0	118	0	84	0	84	0	0	0	0	202
Hourly Total	584	3	0	587	1	416	0	417	1	1	0	2	1006
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	99	0	0	99	0	81	0	81	3	0	0	3	183
10:15 AM	84	1	0	85	0	114	0	114	1	0	0	1	200
10:30 AM	121	0	0	121	1	116	0	117	0	0	0	0	238
10:45 AM	137	0	0	137	0	97	0	97	0	0	0	0	234
Hourly Total	441	1	0	442	1	408	0	409	4	0	0	4	855
11:00 AM	127	0	0	127	0	121	0	121	0	0	0	0	248
11:15 AM	130	0	0	130	1	97	0	98	0	0	0	0	228
11:30 AM	125	1	0	126	0	110	0	110	0	0	0	0	236
11:45 AM	124	0	0	124	1	104	0	105	1	1	0	2	231
Hourly Total	506	1	0	507	2	432	0	434	1	1	0	2	943
12:00 PM	161	0	0	161	0	123	0	123	0	0	0	0	284
12:15 PM	123	0	0	123	1	140	0	141	0	0	0	0	264
12:30 PM	138	1	0	139	0	147	0	147	0	1	0	1	287
12:45 PM	169	1	0	170	0	130	0	130	0	0	0	0	300
Hourly Total	591	2	0	593	1	540	0	541	0	1	0	1	1135
1:00 PM	145	0	0	145	0	146	0	146	1	1	0	2	293
1:15 PM	148	0	0	148	0	115	0	115	0	0	0	0	263
1:30 PM	134	1	0	135	0	128	0	128	0	1	0	1	264
1:45 PM	133	1	0	134	0	126	0	126	0	1	0	1	261

Hourly Total	560	2	0	562	0	515	0	515	1	3	0	4	1081
Grand Total	7478	16	0	7494	11	6245	0	6256	16	13	0	29	13779
Approach %	99.8	0.2	-	-	0.2	99.8	-	-	55.2	44.8	-	-	-
Total %	54.3	0.1	-	54.4	0.1	45.3	-	45.4	0.1	0.1	-	0.2	-
Lights	7328	15	-	7343	11	6144	-	6155	16	13	-	29	13527
% Lights	98.0	93.8	-	98.0	100.0	98.4	-	98.4	100.0	100.0	-	100.0	98.2
Other Vehicles	150	1	-	151	0	101	-	101	0	0	-	0	252
% Other Vehicles	2.0	6.3	-	2.0	0.0	1.6	-	1.6	0.0	0.0	-	0.0	1.8
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 3

Fake Approach [SB]		
Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Norristown Road [EB]		
Out	In	Total
6160	7343	13503
101	151	252
0	0	0
6261	**7494**	**13755**

7328	150	0	**7478**
15	1	0	**16**
0	0	0	**0**
T	R	P	

10/24/2024 6:00 AM
Ending At
10/26/2024 2:00 PM

Lights
Other Vehicles
Pedestrians

6144	101	0	**7491**
11	0	0	**6256**
0	0	0	**13747**
T	L	P	

Norristown Road [WB]		
Out	In	Total
7341	6155	13496
150	101	251
0	0	0
7491	**6256**	**13747**

L	R	P
16	13	0
0	0	0
0	0	0
16	**13**	**0**

26	29	55
1	0	1
0	0	0
27	**29**	**56**
Out	In	Total
Beech Hollow Road [NB]		

Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound				Beech Hollow Road Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:30 AM	181	0	0	181	0	181	0	181	0	0	0	0	362
7:45 AM	172	0	0	172	0	183	0	183	1	0	0	1	356
8:00 AM	196	0	0	196	0	143	0	143	1	0	0	1	340
8:15 AM	170	1	0	171	0	147	0	147	1	2	0	3	321
Total	719	1	0	720	0	654	0	654	3	2	0	5	1379
Approach %	99.9	0.1	-	-	0.0	100.0	-	-	60.0	40.0	-	-	-
Total %	52.1	0.1	-	52.2	0.0	47.4	-	47.4	0.2	0.1	-	0.4	-
PHF	0.917	0.250	-	0.918	0.000	0.893	-	0.893	0.750	0.250	-	0.417	0.952
Lights	686	1	-	687	0	641	-	641	3	2	-	5	1333
% Lights	95.4	100.0	-	95.4	-	98.0	-	98.0	100.0	100.0	-	100.0	96.7
Other Vehicles	33	0	-	33	0	13	-	13	0	0	-	0	46
% Other Vehicles	4.6	0.0	-	4.6	-	2.0	-	2.0	0.0	0.0	-	0.0	3.3
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 5

Fake Approach [SB]		
Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Norristown Road [EB]		
Out	In	Total
644	687	1331
13	33	46
0	0	0
657	**720**	**1377**

0	1	686
0	0	33
0	0	0
0	**1**	**719**
P	R	T

Peak Hour Data

10/24/2024 7:30 AM
Ending At
10/24/2024 8:30 AM

Lights
Other Vehicles
Pedestrians

T	L	P
654	**0**	**0**
0	0	0
13	0	0
641	0	0

Norristown Road [WB]		
Out	In	Total
688	641	1329
33	13	46
0	0	0
721	**654**	**1375**

L	R	P
3	2	0
0	0	0
0	0	0
3	**2**	**0**

1	5	6
0	0	0
0	0	0
1	**5**	**6**
Out	In	Total
Beech Hollow Road [NB]		

Turning Movement Peak Hour Data Plot (7:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (3:00 PM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound				Beech Hollow Road Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
3:00 PM	341	1	0	342	0	138	0	138	1	1	0	2	482
3:15 PM	373	1	0	374	1	126	0	127	1	0	0	1	502
3:30 PM	221	0	0	221	0	150	0	150	0	0	0	0	371
3:45 PM	159	0	0	159	0	166	0	166	1	0	0	1	326
Total	1094	2	0	1096	1	580	0	581	3	1	0	4	1681
Approach %	99.8	0.2	-	-	0.2	99.8	-	-	75.0	25.0	-	-	-
Total %	65.1	0.1	-	65.2	0.1	34.5	-	34.6	0.2	0.1	-	0.2	-
PHF	0.733	0.500	-	0.733	0.250	0.873	-	0.875	0.750	0.250	-	0.500	0.837
Lights	1071	2	-	1073	1	568	-	569	3	1	-	4	1646
% Lights	97.9	100.0	-	97.9	100.0	97.9	-	97.9	100.0	100.0	-	100.0	97.9
Other Vehicles	23	0	-	23	0	12	-	12	0	0	-	0	35
% Other Vehicles	2.1	0.0	-	2.1	0.0	2.1	-	2.1	0.0	0.0	-	0.0	2.1
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 7

Fake Approach [SB]		
Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Norristown Road [EB]			
	Out	In	Total
T	571	1073	1644
R	12	23	35
P	0	0	0
	583	**1096**	**1679**

0	2	1071
0	0	23
0	0	0
0	**2**	**1094**

Peak Hour Data

10/24/2024 3:00 PM
Ending At
10/24/2024 4:00 PM

Lights
Other Vehicles
Pedestrians

568	1	0
12	0	0
0	0	0
580	**1**	**0**

Norristown Road [WB]			
	Out	In	Total
T	1072	569	1641
L	23	12	35
P	0	0	0
	1095	**581**	**1676**

L	R	P
3	1	0
0	0	0
0	0	0
3	**1**	**0**

3	4	7
0	0	0
0	0	0
3	**4**	**7**
Out	In	Total
Beech Hollow Road [NB]		

Turning Movement Peak Hour Data Plot (3:00 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (12:15 PM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound				Beech Hollow Road Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
12:15 PM	123	0	0	123	1	140	0	141	0	0	0	0	264
12:30 PM	138	1	0	139	0	147	0	147	0	1	0	1	287
12:45 PM	169	1	0	170	0	130	0	130	0	0	0	0	300
1:00 PM	145	0	0	145	0	146	0	146	1	1	0	2	293
Total	575	2	0	577	1	563	0	564	1	2	0	3	1144
Approach %	99.7	0.3	-	-	0.2	99.8	-	-	33.3	66.7	-	-	-
Total %	50.3	0.2	-	50.4	0.1	49.2	-	49.3	0.1	0.2	-	0.3	-
PHF	0.851	0.500	-	0.849	0.250	0.957	-	0.959	0.250	0.500	-	0.375	0.953
Lights	571	2	-	573	1	561	-	562	1	2	-	3	1138
% Lights	99.3	100.0	-	99.3	100.0	99.6	-	99.6	100.0	100.0	-	100.0	99.5
Other Vehicles	4	0	-	4	0	2	-	2	0	0	-	0	6
% Other Vehicles	0.7	0.0	-	0.7	0.0	0.4	-	0.4	0.0	0.0	-	0.0	0.5
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 2 Beech Hollow Road & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 9

Fake Approach [SB]		
Out	In	Total
0	0	0
0	0	0
0	0	0
0	**0**	**0**

Norristown Road [EB]					
	Out	In	Total		
	562	573	1135		
	2	4	6		
	0	0	0		
	564	**577**	**1141**		

0	2	0	4	571
0	0	0	0	0
0	0	0	0	0
0	**2**	**0**	**4**	**571**
P	R	L	T	

Peak Hour Data

10/26/2024 12:15 PM
Ending At
10/26/2024 1:15 PM

Lights
Other Vehicles
Pedestrians

P	L	T		
0	1	2	0	561
0	0	0	0	0
0	0	0	0	0
0	**1**	**2**	**0**	**563**
Norristown Road [WB]				
Total	In	Out		
1135	562	573		
6	2	4		
0	0	0		
1141	**564**	**577**		

L	R	P
1	2	0
0	0	0
0	0	0
1	**2**	**0**

3	3	6
0	0	0
0	0	0
3	**3**	**6**
Out	In	Total
Beech Hollow Road [NB]		

Turning Movement Peak Hour Data Plot (12:15 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 1

Turning Movement Data

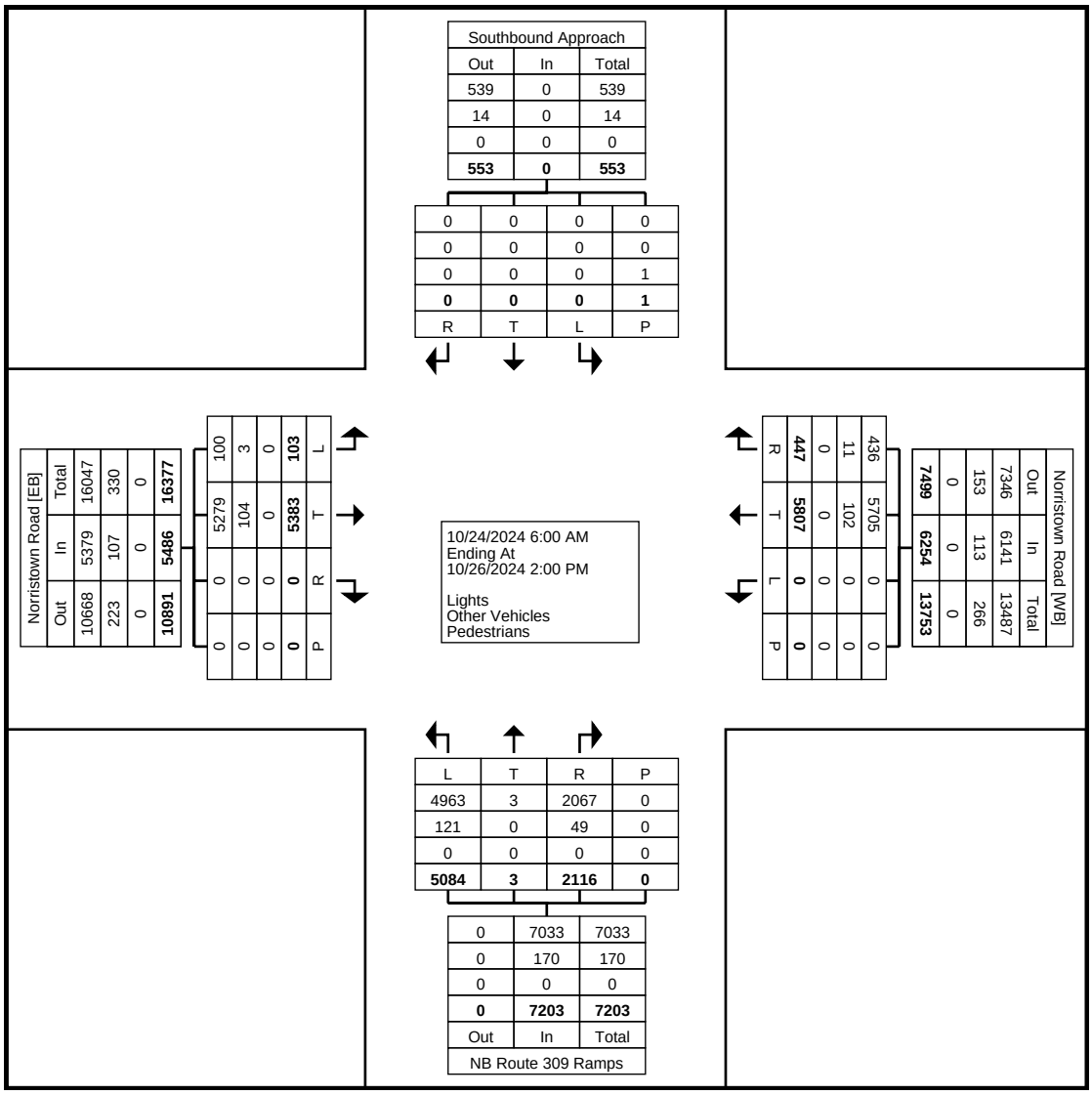
Start Time	Norristown Road Eastbound					Norristown Road Westbound						NB Route 309 Ramps Northbound						Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
6:00 AM	0	33	0	0	33	0	61	2	1	0	64	74	0	12	7	0	93	0	0	0	0	0	190
6:15 AM	0	48	0	0	48	0	81	4	0	0	85	96	0	17	14	0	127	0	0	0	0	0	260
6:30 AM	3	91	0	0	94	0	84	4	1	0	89	116	0	12	16	0	144	0	0	0	0	0	327
6:45 AM	1	96	0	0	97	0	117	2	4	0	123	128	0	21	21	0	170	0	0	0	0	0	390
Hourly Total	4	268	0	0	272	0	343	12	6	0	361	414	0	62	58	0	534	0	0	0	0	0	1167
7:00 AM	1	80	0	0	81	0	127	2	0	0	129	152	0	23	27	0	202	0	0	0	0	0	412
7:15 AM	0	82	0	0	82	0	133	9	0	0	142	150	0	19	28	0	197	0	0	0	0	0	421
7:30 AM	0	128	0	0	128	0	170	12	0	0	182	188	0	16	30	0	234	0	0	0	0	0	544
7:45 AM	2	90	0	0	92	0	170	5	0	0	175	191	0	25	53	0	269	0	0	0	1	0	536
Hourly Total	3	380	0	0	383	0	600	28	0	0	628	681	0	83	138	0	902	0	0	0	1	0	1913
8:00 AM	2	137	0	0	139	0	143	5	0	0	148	186	0	30	37	0	253	0	0	0	0	0	540
8:15 AM	0	122	0	0	122	0	137	2	1	0	140	187	0	21	37	0	245	0	0	0	0	0	507
8:30 AM	1	112	0	0	113	0	122	2	0	0	124	176	1	21	41	0	239	0	0	0	0	0	476
8:45 AM	2	131	0	0	133	0	142	3	2	0	147	161	0	21	35	0	217	0	0	0	0	0	497
Hourly Total	5	502	0	0	507	0	544	12	3	0	559	710	1	93	150	0	954	0	0	0	0	0	2020
9:00 AM	1	90	0	0	91	0	131	5	1	0	137	175	0	19	32	0	226	0	0	0	0	0	454
9:15 AM	1	105	0	0	106	0	127	5	0	0	132	154	0	24	23	0	201	0	0	0	0	0	439
9:30 AM	1	101	0	0	102	0	110	6	2	0	118	132	0	16	21	0	169	0	0	0	0	0	389
9:45 AM	4	96	0	0	100	0	142	5	5	0	152	108	0	15	12	0	135	0	0	0	0	0	387
Hourly Total	7	392	0	0	399	0	510	21	8	0	539	569	0	74	88	0	731	0	0	0	0	0	1669
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	3	289	0	0	292	0	123	8	7	0	138	83	0	33	14	0	130	0	0	0	0	0	560
3:15 PM	5	328	0	0	333	0	111	14	1	0	126	114	0	34	13	0	161	0	0	0	0	0	620
3:30 PM	4	133	0	0	137	0	133	14	3	0	150	81	0	21	29	0	131	0	0	0	0	0	418
3:45 PM	6	119	0	0	125	0	158	10	1	0	169	95	0	18	20	0	133	0	0	0	0	0	427
Hourly Total	18	869	0	0	887	0	525	46	12	0	583	373	0	106	76	0	555	0	0	0	0	0	2025
4:00 PM	8	130	0	0	138	0	123	6	4	0	133	87	0	21	27	0	135	0	0	0	0	0	406
4:15 PM	7	122	0	0	129	0	168	10	6	0	184	104	0	8	30	0	142	0	0	0	0	0	455
4:30 PM	5	136	0	0	141	0	137	15	7	0	159	95	0	17	38	0	150	0	0	0	0	0	450
4:45 PM	2	121	0	0	123	0	159	9	3	0	171	112	0	19	31	0	162	0	0	0	0	0	456
Hourly Total	22	509	0	0	531	0	587	40	20	0	647	398	0	65	126	0	589	0	0	0	0	0	1767
5:00 PM	5	119	0	0	124	0	148	17	4	0	169	89	0	22	23	0	134	0	0	0	0	0	427
5:15 PM	2	130	0	0	132	0	124	10	6	0	140	89	0	27	20	0	136	0	0	0	0	0	408
5:30 PM	3	152	0	0	155	0	145	8	2	0	155	113	1	24	28	0	166	0	0	0	0	0	476
5:45 PM	3	127	0	0	130	0	139	8	5	0	152	114	0	33	32	0	179	0	0	0	0	0	461
Hourly Total	13	528	0	0	541	0	556	43	17	0	616	405	1	106	103	0	615	0	0	0	0	0	1772
6:00 PM	2	128	0	0	130	0	118	6	3	0	127	108	0	21	24	0	153	0	0	0	0	0	410
6:15 PM	1	115	0	0	116	0	114	5	3	0	122	82	0	15	30	0	127	0	0	0	0	0	365
6:30 PM	1	91	0	0	92	0	81	4	2	0	87	75	0	11	32	0	118	0	0	0	0	0	297
6:45 PM	3	75	0	0	78	0	83	3	0	0	86	82	0	13	32	0	127	0	0	0	0	0	291
Hourly Total	7	409	0	0	416	0	396	18	8	0	422	347	0	60	118	0	525	0	0	0	0	0	1363
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	2	88	0	0	90	0	67	6	0	0	73	60	0	13	9	0	82	0	0	0	0	0	245
10:15 AM	1	54	0	0	55	0	110	13	1	0	124	49	0	15	13	0	77	0	0	0	0	0	256
10:30 AM	0	93	0	0	93	0	97	6	1	0	104	68	0	24	13	0	105	0	0	0	0	0	302
10:45 AM	2	105	0	0	107	0	96	10	1	0	107	69	0	30	8	0	107	0	0	0	0	0	321
Hourly Total	5	340	0	0	345	0	370	35	3	0	408	246	0	82	43	0	371	0	0	0	0	0	1124
11:00 AM	1	91	0	0	92	0	108	15	3	0	126	65	0	16	22	0	103	0	0	0	0	0	321
11:15 AM	1	115	0	0	116	0	87	5	2	0	94	59	0	14	22	0	95	0	0	0	0	0	305
11:30 AM	2	92	0	0	94	0	106	3	2	0	111	75	0	11	19	0	105	0	0	0	0	0	310
11:45 AM	4	86	0	0	90	0	88	5	2	0	95	82	0	13	29	0	124	0	0	0	0	0	309
Hourly Total	8	384	0	0	392	0	389	28	9	0	426	281	0	54	92	0	427	0	0	0	0	0	1245
12:00 PM	1	108	0	0	109	0	120	10	1	0	131	76	0	16	28	0	120	0	0	0	0	0	360
12:15 PM	1	85	0	0	86	0	130	5	3	0	138	74	0	17	27	0	118	0	0	0	0	0	342
12:30 PM	1	81	0	0	82	0	140	7	2	0	149	88	0	20	28	0	136	0	0	0	0	0	367
12:45 PM	2	120	0	0	122	0	122	9	0	0	131	72	0	16	30	0	118	0	0	0	0	0	371
Hourly Total	5	394	0	0	399	0	512	31	6	0	549	310	0	69	113	0	492	0	0	0	0	0	1440
1:00 PM	1	102	0	0	103	0	132	8	2	0	142	81	0	16	23	0	120	0	0	0	0	0	365
1:15 PM	1	124	0	0	125	0	112	7	3	0	122	101	0	17	21	0	139	0	0	0	0	0	386

1:30 PM	2	87	0	0	89	0	115	8	4	0	127	79	1	16	17	0	113	0	0	0	0	0	329
1:45 PM	2	95	0	0	97	0	116	9	0	0	125	89	0	24	23	0	136	0	0	0	0	0	358
Hourly Total	6	408	0	0	414	0	475	32	9	0	516	350	1	73	84	0	508	0	0	0	0	0	1438
Grand Total	103	5383	0	0	5486	0	5807	346	101	0	6254	5084	3	927	1189	0	7203	0	0	0	1	0	18943
Approach %	1.9	98.1	0.0	-	-	0.0	92.9	5.5	1.6	-	-	70.6	0.0	12.9	16.5	-	-	0.0	0.0	0.0	-	-	-
Total %	0.5	28.4	0.0	-	29.0	0.0	30.7	1.8	0.5	-	33.0	26.8	0.0	4.9	6.3	-	38.0	0.0	0.0	0.0	-	0.0	-
Lights	100	5279	0	-	5379	0	5705	336	100	-	6141	4963	3	908	1159	-	7033	0	0	0	-	0	18553
% Lights	97.1	98.1	-	-	98.0	-	98.2	97.1	99.0	-	98.2	97.6	100.0	98.0	97.5	-	97.6	-	-	-	-	-	97.9
Other Vehicles	3	104	0	-	107	0	102	10	1	-	113	121	0	19	30	-	170	0	0	0	-	0	390
% Other Vehicles	2.9	1.9	-	-	2.0	-	1.8	2.9	1.0	-	1.8	2.4	0.0	2.0	2.5	-	2.4	-	-	-	-	-	2.1
Pedestrians	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 3



Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024

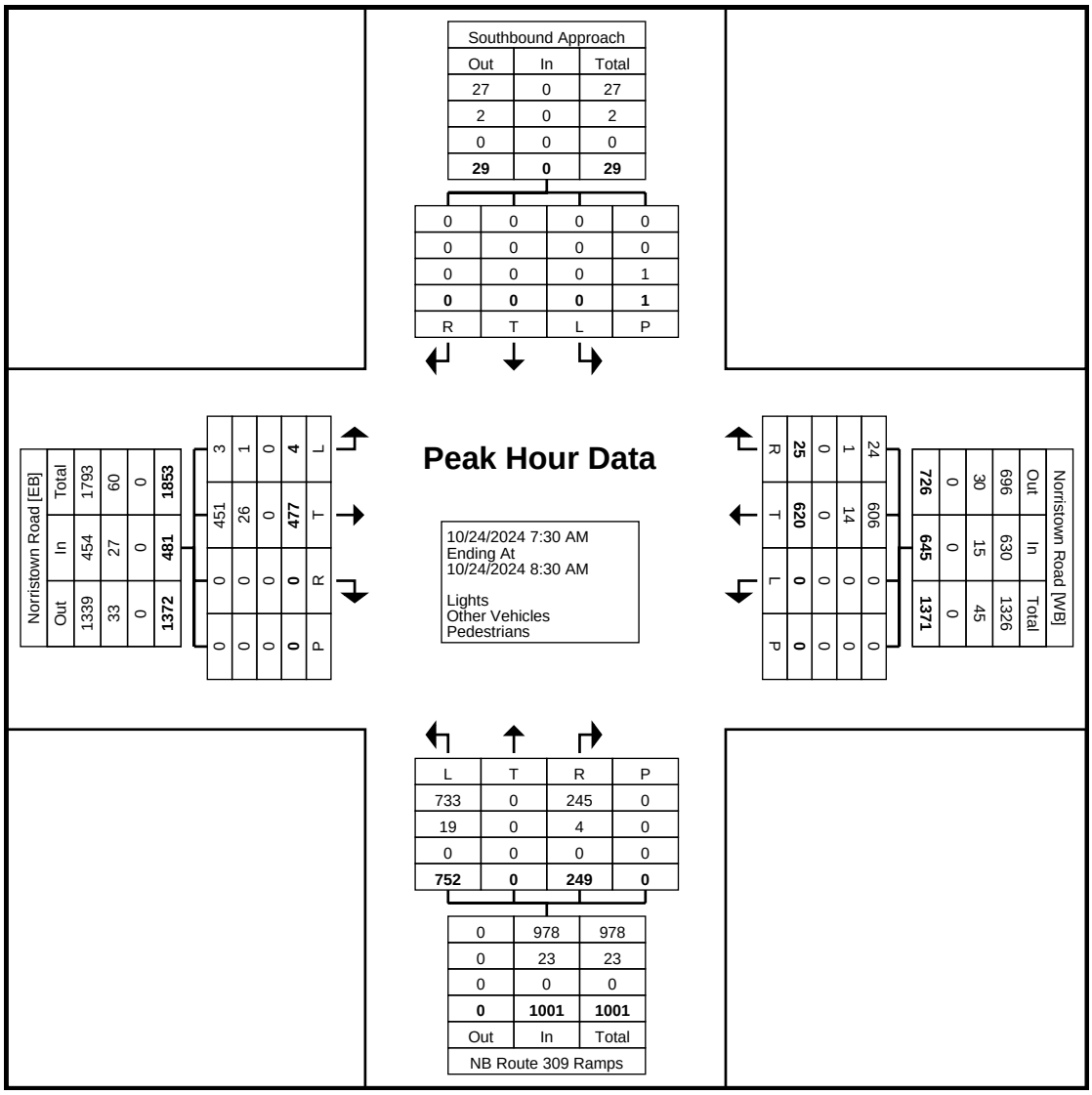
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Norristown Road Eastbound					Norristown Road Westbound						NB Route 309 Ramps Northbound						Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	0	128	0	0	128	0	170	12	0	0	182	188	0	16	30	0	234	0	0	0	0	0	544
7:45 AM	2	90	0	0	92	0	170	5	0	0	175	191	0	25	53	0	269	0	0	0	1	0	536
8:00 AM	2	137	0	0	139	0	143	5	0	0	148	186	0	30	37	0	253	0	0	0	0	0	540
8:15 AM	0	122	0	0	122	0	137	2	1	0	140	187	0	21	37	0	245	0	0	0	0	0	507
Total	4	477	0	0	481	0	620	24	1	0	645	752	0	92	157	0	1001	0	0	0	1	0	2127
Approach %	0.8	99.2	0.0	-	-	0.0	96.1	3.7	0.2	-	-	75.1	0.0	9.2	15.7	-	-	0.0	0.0	0.0	-	-	-
Total %	0.2	22.4	0.0	-	22.6	0.0	29.1	1.1	0.0	-	30.3	35.4	0.0	4.3	7.4	-	47.1	0.0	0.0	0.0	-	0.0	-
PHF	0.500	0.870	0.000	-	0.865	0.000	0.912	0.500	0.250	-	0.886	0.984	0.000	0.767	0.741	-	0.930	0.000	0.000	0.000	-	0.000	0.977
Lights	3	451	0	-	454	0	606	23	1	-	630	733	0	90	155	-	978	0	0	0	-	0	2062
% Lights	75.0	94.5	-	-	94.4	-	97.7	95.8	100.0	-	97.7	97.5	-	97.8	98.7	-	97.7	-	-	-	-	-	96.9
Other Vehicles	1	26	0	-	27	0	14	1	0	-	15	19	0	2	2	-	23	0	0	0	-	0	65
% Other Vehicles	25.0	5.5	-	-	5.6	-	2.3	4.2	0.0	-	2.3	2.5	-	2.2	1.3	-	2.3	-	-	-	-	-	3.1
Pedestrians	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024

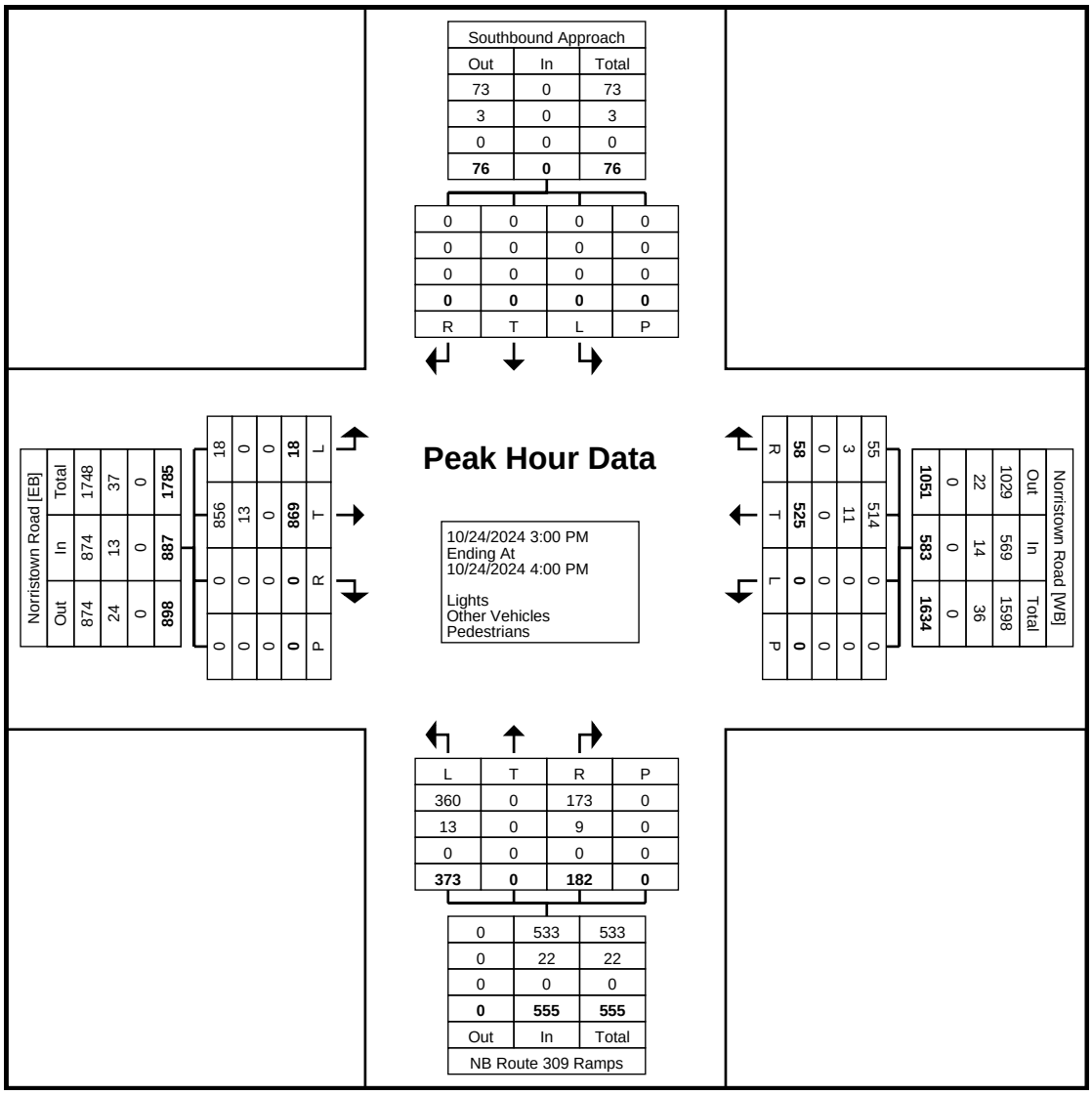
Turning Movement Peak Hour Data (3:00 PM)

Start Time	Norristown Road Eastbound					Norristown Road Westbound						NB Route 309 Ramps Northbound						Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
3:00 PM	3	289	0	0	292	0	123	8	7	0	138	83	0	33	14	0	130	0	0	0	0	0	560
3:15 PM	5	328	0	0	333	0	111	14	1	0	126	114	0	34	13	0	161	0	0	0	0	0	620
3:30 PM	4	133	0	0	137	0	133	14	3	0	150	81	0	21	29	0	131	0	0	0	0	0	418
3:45 PM	6	119	0	0	125	0	158	10	1	0	169	95	0	18	20	0	133	0	0	0	0	0	427
Total	18	869	0	0	887	0	525	46	12	0	583	373	0	106	76	0	555	0	0	0	0	0	2025
Approach %	2.0	98.0	0.0	-	-	0.0	90.1	7.9	2.1	-	-	67.2	0.0	19.1	13.7	-	-	0.0	0.0	0.0	-	-	-
Total %	0.9	42.9	0.0	-	43.8	0.0	25.9	2.3	0.6	-	28.8	18.4	0.0	5.2	3.8	-	27.4	0.0	0.0	0.0	-	0.0	-
PHF	0.750	0.662	0.000	-	0.666	0.000	0.831	0.821	0.429	-	0.862	0.818	0.000	0.779	0.655	-	0.862	0.000	0.000	0.000	-	0.000	0.817
Lights	18	856	0	-	874	0	514	43	12	-	569	360	0	100	73	-	533	0	0	0	-	0	1976
% Lights	100.0	98.5	-	-	98.5	-	97.9	93.5	100.0	-	97.6	96.5	-	94.3	96.1	-	96.0	-	-	-	-	-	97.6
Other Vehicles	0	13	0	-	13	0	11	3	0	-	14	13	0	6	3	-	22	0	0	0	-	0	49
% Other Vehicles	0.0	1.5	-	-	1.5	-	2.1	6.5	0.0	-	2.4	3.5	-	5.7	3.9	-	4.0	-	-	-	-	-	2.4
Pedestrians	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 7



Turning Movement Peak Hour Data Plot (3:00 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024

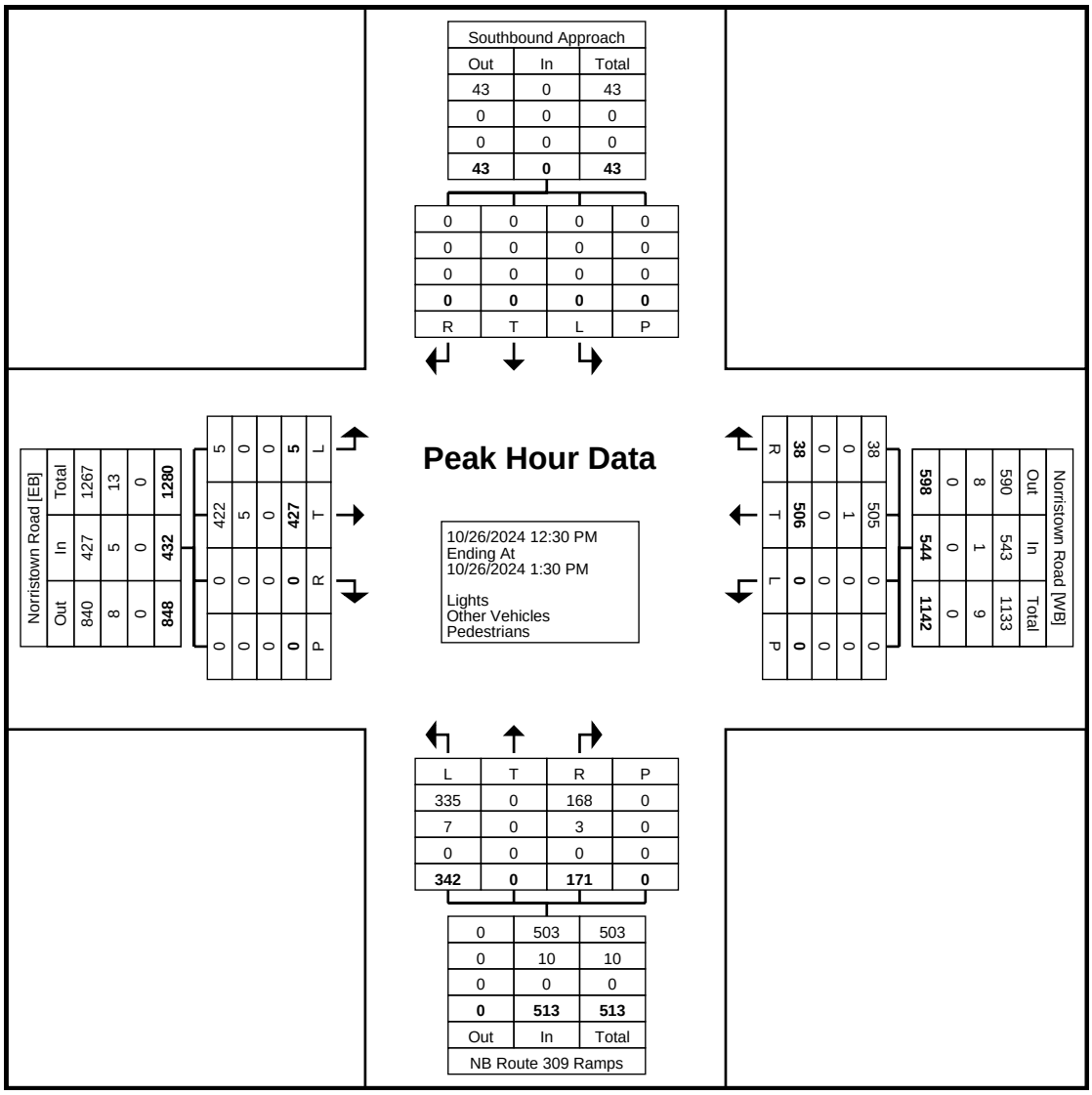
Turning Movement Peak Hour Data (12:30 PM)

Start Time	Norristown Road Eastbound					Norristown Road Westbound						NB Route 309 Ramps Northbound						Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:30 PM	1	81	0	0	82	0	140	7	2	0	149	88	0	20	28	0	136	0	0	0	0	0	367
12:45 PM	2	120	0	0	122	0	122	9	0	0	131	72	0	16	30	0	118	0	0	0	0	0	371
1:00 PM	1	102	0	0	103	0	132	8	2	0	142	81	0	16	23	0	120	0	0	0	0	0	365
1:15 PM	1	124	0	0	125	0	112	7	3	0	122	101	0	17	21	0	139	0	0	0	0	0	386
Total	5	427	0	0	432	0	506	31	7	0	544	342	0	69	102	0	513	0	0	0	0	0	1489
Approach %	1.2	98.8	0.0	-	-	0.0	93.0	5.7	1.3	-	-	66.7	0.0	13.5	19.9	-	-	0.0	0.0	0.0	-	-	-
Total %	0.3	28.7	0.0	-	29.0	0.0	34.0	2.1	0.5	-	36.5	23.0	0.0	4.6	6.9	-	34.5	0.0	0.0	0.0	-	0.0	-
PHF	0.625	0.861	0.000	-	0.864	0.000	0.904	0.861	0.583	-	0.913	0.847	0.000	0.863	0.850	-	0.923	0.000	0.000	0.000	-	0.000	0.964
Lights	5	422	0	-	427	0	505	31	7	-	543	335	0	66	102	-	503	0	0	0	-	0	1473
% Lights	100.0	98.8	-	-	98.8	-	99.8	100.0	100.0	-	99.8	98.0	-	95.7	100.0	-	98.1	-	-	-	-	-	98.9
Other Vehicles	0	5	0	-	5	0	1	0	0	-	1	7	0	3	0	-	10	0	0	0	-	0	16
% Other Vehicles	0.0	1.2	-	-	1.2	-	0.2	0.0	0.0	-	0.2	2.0	-	4.3	0.0	-	1.9	-	-	-	-	-	1.1
Pedestrians	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 3 NB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 9



Turning Movement Peak Hour Data Plot (12:30 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 1

Turning Movement Data

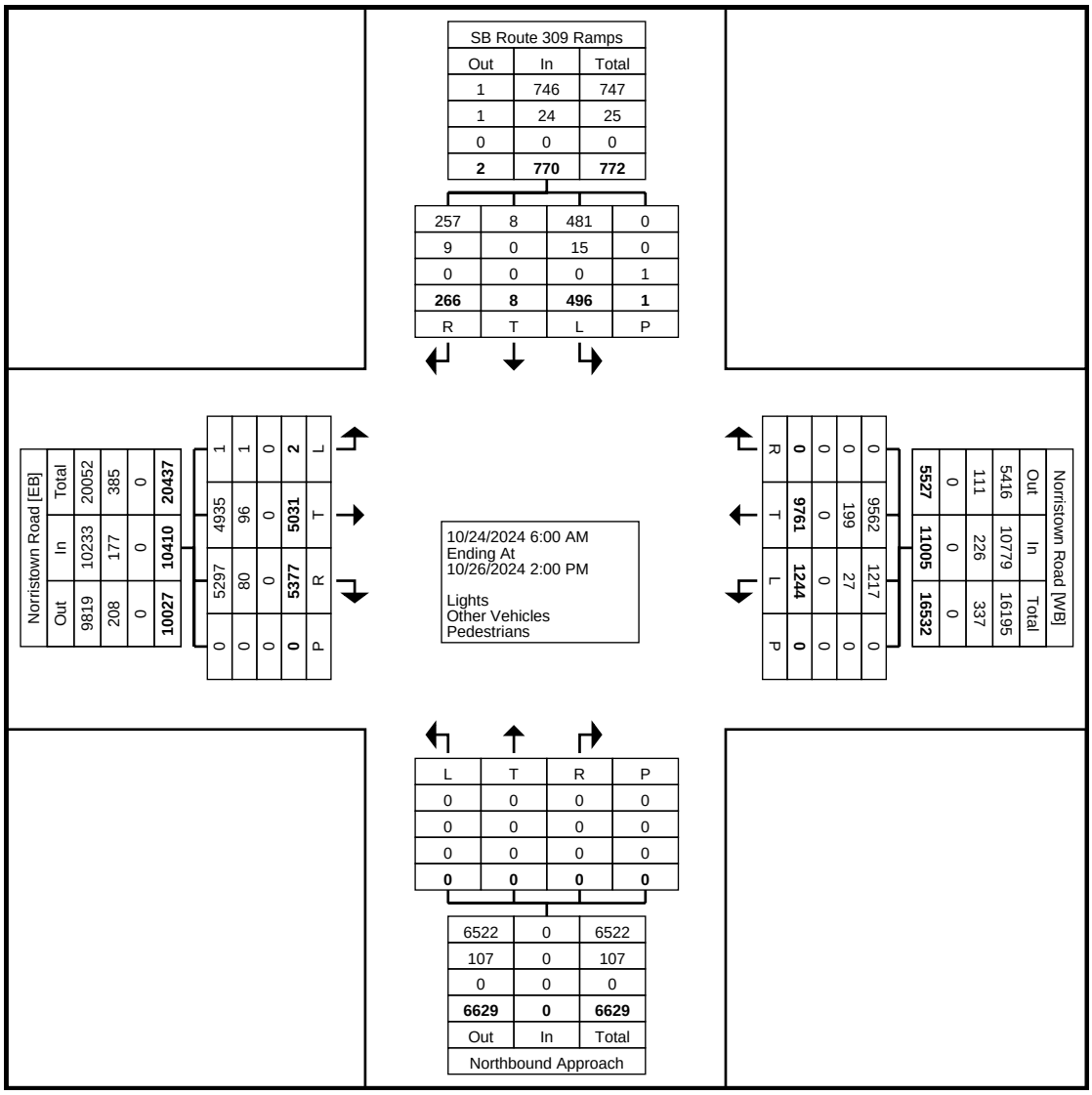
Start Time	Norristown Road Eastbound						Norristown Road Westbound					Northbound Approach Northbound						SB Route 309 Ramps Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
6:00 AM	0	34	39	9	0	82	14	127	0	0	141	0	0	0	0	0	0	1	0	0	2	0	3	226
6:15 AM	0	54	40	32	0	126	21	160	0	0	181	0	0	0	0	0	0	4	0	1	1	0	6	313
6:30 AM	0	77	53	24	0	154	12	184	0	0	196	0	0	0	0	0	0	10	0	0	5	0	15	365
6:45 AM	0	86	50	37	0	173	31	218	0	0	249	0	0	0	0	0	0	7	0	1	3	0	11	433
Hourly Total	0	251	182	102	0	535	78	689	0	0	767	0	0	0	0	0	0	22	0	2	11	0	35	1337
7:00 AM	0	75	70	37	0	182	42	229	0	0	271	0	0	0	0	0	0	7	0	2	5	0	14	467
7:15 AM	0	88	73	79	0	240	38	241	0	0	279	0	0	0	0	0	0	6	0	2	0	0	8	527
7:30 AM	0	114	72	65	0	251	53	293	0	0	346	0	0	0	0	0	0	11	0	2	2	0	15	612
7:45 AM	0	98	59	70	0	227	42	309	0	0	351	0	0	0	0	0	0	9	0	0	2	1	11	589
Hourly Total	0	375	274	251	0	900	175	1072	0	0	1247	0	0	0	0	0	0	33	0	6	9	1	48	2195
8:00 AM	0	116	115	10	0	241	38	304	0	0	342	0	0	0	0	0	0	13	0	4	4	0	21	604
8:15 AM	0	122	120	16	0	258	35	294	0	0	329	0	0	0	0	0	0	12	0	5	4	0	21	608
8:30 AM	0	95	109	15	0	219	24	283	0	0	307	0	0	0	0	0	0	9	0	0	9	0	18	544
8:45 AM	0	126	102	13	0	241	31	282	0	0	313	0	0	0	0	0	0	13	0	3	6	0	22	576
Hourly Total	0	459	446	54	0	959	128	1163	0	0	1291	0	0	0	0	0	0	47	0	12	23	0	82	2332
9:00 AM	0	92	96	14	0	202	20	275	0	0	295	0	0	0	0	0	0	6	0	4	6	0	16	513
9:15 AM	0	89	78	11	0	178	23	271	0	0	294	0	0	0	0	0	0	6	0	2	3	0	11	483
9:30 AM	0	94	64	25	0	183	15	230	0	0	245	0	0	0	0	0	0	8	0	3	3	0	14	442
9:45 AM	0	107	65	15	0	187	22	235	0	0	257	0	0	0	0	0	0	6	0	1	5	0	12	456
Hourly Total	0	382	303	65	0	750	80	1011	0	0	1091	0	0	0	0	0	0	26	0	10	17	0	53	1894
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	271	0	0	0	272	0	212	0	0	212	0	0	0	0	0	0	42	0	23	28	0	93	577
3:15 PM	0	267	1	0	0	268	4	221	0	0	225	0	0	0	0	0	0	50	0	20	36	0	106	599
3:30 PM	1	117	115	59	0	292	37	187	0	0	224	0	0	0	0	0	0	14	2	2	14	0	32	548
3:45 PM	0	125	93	50	0	268	38	226	0	0	264	0	0	0	0	0	0	9	0	0	1	0	10	542
Hourly Total	2	780	209	109	0	1100	79	846	0	0	925	0	0	0	0	0	0	115	2	45	79	0	241	2266
4:00 PM	0	130	171	15	0	316	31	184	0	0	215	0	0	0	0	0	0	7	2	0	2	0	11	542
4:15 PM	0	137	191	9	0	337	51	215	0	0	266	0	0	0	0	0	0	7	0	0	1	0	8	611
4:30 PM	0	133	254	14	0	401	35	188	0	0	223	0	0	0	0	0	0	6	0	0	2	0	8	632
4:45 PM	0	111	169	12	0	292	36	246	0	0	282	0	0	0	0	0	0	6	1	0	2	0	9	583
Hourly Total	0	511	785	50	0	1346	153	833	0	0	986	0	0	0	0	0	0	26	3	0	7	0	36	2368
5:00 PM	0	118	156	59	0	333	35	194	0	0	229	0	0	0	0	0	0	6	1	0	2	0	9	571
5:15 PM	0	122	136	68	0	326	41	177	0	0	218	0	0	0	0	0	0	13	0	0	1	0	14	558
5:30 PM	0	156	112	61	0	329	37	222	0	0	259	0	0	0	0	0	0	9	0	0	1	0	10	598
5:45 PM	0	112	84	65	0	261	21	228	0	0	249	0	0	0	0	0	0	14	0	1	0	0	15	525
Hourly Total	0	508	488	253	0	1249	134	821	0	0	955	0	0	0	0	0	0	42	1	1	4	0	48	2252
6:00 PM	0	120	119	15	0	254	23	193	0	0	216	0	0	0	0	0	0	9	1	1	1	0	12	482
6:15 PM	0	105	105	17	0	227	19	187	0	0	206	0	0	0	0	0	0	6	0	1	1	0	8	441
6:30 PM	0	80	68	9	0	157	16	144	0	0	160	0	0	0	0	0	0	5	0	2	1	0	8	325
6:45 PM	0	72	76	13	0	161	12	154	0	0	166	0	0	0	0	0	0	7	1	2	1	0	11	338
Hourly Total	0	377	368	54	0	799	70	678	0	0	748	0	0	0	0	0	0	27	2	6	4	0	39	1586
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	0	82	82	7	0	171	20	111	0	0	131	0	0	0	0	0	0	6	0	0	0	0	6	308
10:15 AM	0	48	72	6	0	126	24	126	0	0	150	0	0	0	0	0	0	9	0	1	0	0	10	286
10:30 AM	0	89	82	11	0	182	35	135	0	0	170	0	0	0	0	0	0	6	0	1	0	0	7	359
10:45 AM	0	95	81	10	0	186	19	149	0	0	168	0	0	0	0	0	0	11	0	1	1	0	13	367
Hourly Total	0	314	317	34	0	665	98	521	0	0	619	0	0	0	0	0	0	32	0	3	1	0	36	1320
11:00 AM	0	85	40	31	0	156	19	145	0	0	164	0	0	0	0	0	0	13	0	0	0	0	13	333
11:15 AM	0	91	49	30	0	170	19	135	0	0	154	0	0	0	0	0	0	8	0	0	2	0	10	334
11:30 AM	0	81	48	38	0	167	18	160	0	0	178	0	0	0	0	0	0	14	0	2	1	0	17	362
11:45 AM	0	89	58	42	0	189	18	156	0	0	174	0	0	0	0	0	0	10	0	3	0	0	13	376
Hourly Total	0	346	195	141	0	682	74	596	0	0	670	0	0	0	0	0	0	45	0	5	3	0	53	1405
12:00 PM	0	90	61	22	0	173	22	177	0	0	199	0	0	0	0	0	0	11	0	0	2	0	13	385
12:15 PM	0	77	58	35	0	170	18	177	0	0	195	0	0	0	0	0	0	7	0	0	1	0	8	373
12:30 PM	0	84	64	10	0	158	25	199	0	0	224	0	0	0	0	0	0	9	0	1	1	0	11	393
12:45 PM	0	107	71	18	0	196	20	166	0	0	186	0	0	0	0	0	0	14	0	1	1	0	16	398
Hourly Total	0	358	254	85	0	697	85	719	0	0	804	0	0	0	0	0	0	41	0	2	5	0	48	1549
1:00 PM	0	101	97	5	0	203	29	213	0	0	242	0	0	0	0	0	0	8	0	0	1	0	9	454
1:15 PM	0	104	75	16	0	195	17	202	0	0	219	0	0	0	0	0	0	16	0	2	0	0	18	432

1:30 PM	0	82	67	11	0	160	19	196	0	0	215	0	0	0	0	0	0	10	0	3	1	0	14	389
1:45 PM	0	83	73	14	0	170	25	201	0	0	226	0	0	0	0	0	0	6	0	2	2	0	10	406
Hourly Total	0	370	312	46	0	728	90	812	0	0	902	0	0	0	0	0	0	40	0	7	4	0	51	1681
Grand Total	2	5031	4133	1244	0	10410	1244	9761	0	0	11005	0	0	0	0	0	0	496	8	99	167	1	770	22185
Approach %	0.0	48.3	39.7	12.0	-	-	11.3	88.7	0.0	-	-	0.0	0.0	0.0	0.0	-	-	64.4	1.0	12.9	21.7	-	-	-
Total %	0.0	22.7	18.6	5.6	-	46.9	5.6	44.0	0.0	-	49.6	0.0	0.0	0.0	0.0	-	0.0	2.2	0.0	0.4	0.8	-	3.5	-
Lights	1	4935	4074	1223	-	10233	1217	9562	0	-	10779	0	0	0	0	-	0	481	8	95	162	-	746	21758
% Lights	50.0	98.1	98.6	98.3	-	98.3	97.8	98.0	-	-	97.9	-	-	-	-	-	-	97.0	100.0	96.0	97.0	-	96.9	98.1
Other Vehicles	1	96	59	21	-	177	27	199	0	-	226	0	0	0	0	-	0	15	0	4	5	-	24	427
% Other Vehicles	50.0	1.9	1.4	1.7	-	1.7	2.2	2.0	-	-	2.1	-	-	-	-	-	-	3.0	0.0	4.0	3.0	-	3.1	1.9
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 3



Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024

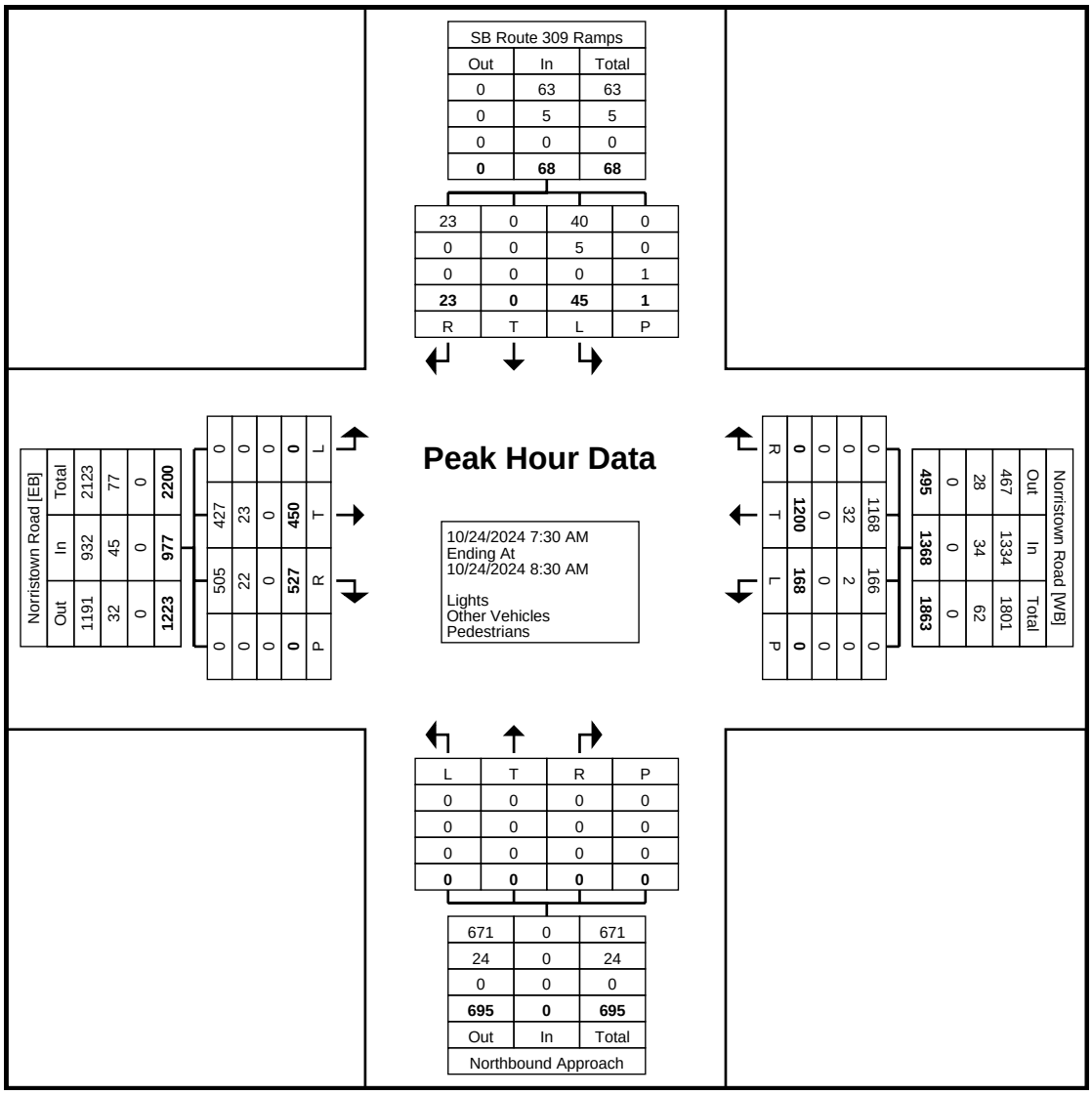
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound					Northbound Approach Northbound						SB Route 309 Ramps Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
7:30 AM	0	114	72	65	0	251	53	293	0	0	346	0	0	0	0	0	0	11	0	2	2	0	15	612
7:45 AM	0	98	59	70	0	227	42	309	0	0	351	0	0	0	0	0	0	9	0	0	2	1	11	589
8:00 AM	0	116	115	10	0	241	38	304	0	0	342	0	0	0	0	0	0	13	0	4	4	0	21	604
8:15 AM	0	122	120	16	0	258	35	294	0	0	329	0	0	0	0	0	0	12	0	5	4	0	21	608
Total	0	450	366	161	0	977	168	1200	0	0	1368	0	0	0	0	0	0	45	0	11	12	1	68	2413
Approach %	0.0	46.1	37.5	16.5	-	-	12.3	87.7	0.0	-	-	0.0	0.0	0.0	0.0	-	-	66.2	0.0	16.2	17.6	-	-	-
Total %	0.0	18.6	15.2	6.7	-	40.5	7.0	49.7	0.0	-	56.7	0.0	0.0	0.0	0.0	-	0.0	1.9	0.0	0.5	0.5	-	2.8	-
PHF	0.000	0.922	0.763	0.575	-	0.947	0.792	0.971	0.000	-	0.974	0.000	0.000	0.000	0.000	-	0.000	0.865	0.000	0.550	0.750	-	0.810	0.986
Lights	0	427	351	154	-	932	166	1168	0	-	1334	0	0	0	0	-	0	40	0	11	12	-	63	2329
% Lights	-	94.9	95.9	95.7	-	95.4	98.8	97.3	-	-	97.5	-	-	-	-	-	-	88.9	-	100.0	100.0	-	92.6	96.5
Other Vehicles	0	23	15	7	-	45	2	32	0	-	34	0	0	0	0	-	0	5	0	0	0	-	5	84
% Other Vehicles	-	5.1	4.1	4.3	-	4.6	1.2	2.7	-	-	2.5	-	-	-	-	-	-	11.1	-	0.0	0.0	-	7.4	3.5
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024

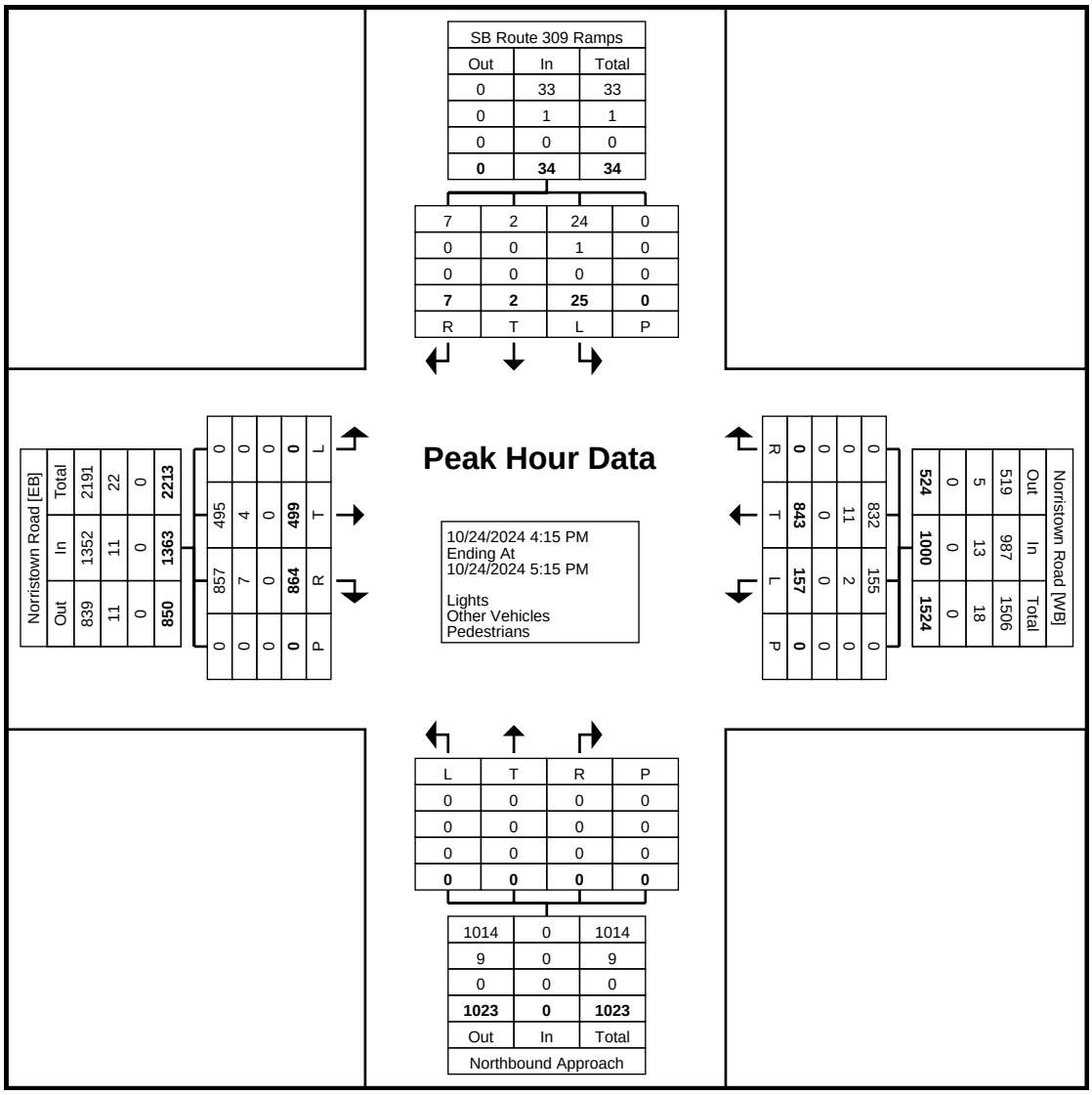
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound					Northbound Approach Northbound						SB Route 309 Ramps Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
4:15 PM	0	137	191	9	0	337	51	215	0	0	266	0	0	0	0	0	0	7	0	0	1	0	8	611
4:30 PM	0	133	254	14	0	401	35	188	0	0	223	0	0	0	0	0	0	6	0	0	2	0	8	632
4:45 PM	0	111	169	12	0	292	36	246	0	0	282	0	0	0	0	0	0	6	1	0	2	0	9	583
5:00 PM	0	118	156	59	0	333	35	194	0	0	229	0	0	0	0	0	0	6	1	0	2	0	9	571
Total	0	499	770	94	0	1363	157	843	0	0	1000	0	0	0	0	0	0	25	2	0	7	0	34	2397
Approach %	0.0	36.6	56.5	6.9	-	-	15.7	84.3	0.0	-	-	0.0	0.0	0.0	0.0	-	-	73.5	5.9	0.0	20.6	-	-	-
Total %	0.0	20.8	32.1	3.9	-	56.9	6.5	35.2	0.0	-	41.7	0.0	0.0	0.0	0.0	-	0.0	1.0	0.1	0.0	0.3	-	1.4	-
PHF	0.000	0.911	0.758	0.398	-	0.850	0.770	0.857	0.000	-	0.887	0.000	0.000	0.000	0.000	-	0.000	0.893	0.500	0.000	0.875	-	0.944	0.948
Lights	0	495	763	94	-	1352	155	832	0	-	987	0	0	0	0	-	0	24	2	0	7	-	33	2372
% Lights	-	99.2	99.1	100.0	-	99.2	98.7	98.7	-	-	98.7	-	-	-	-	-	-	96.0	100.0	-	100.0	-	97.1	99.0
Other Vehicles	0	4	7	0	-	11	2	11	0	-	13	0	0	0	0	-	0	1	0	0	0	-	1	25
% Other Vehicles	-	0.8	0.9	0.0	-	0.8	1.3	1.3	-	-	1.3	-	-	-	-	-	-	4.0	0.0	-	0.0	-	2.9	1.0
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 7



Turning Movement Peak Hour Data Plot (4:15 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024

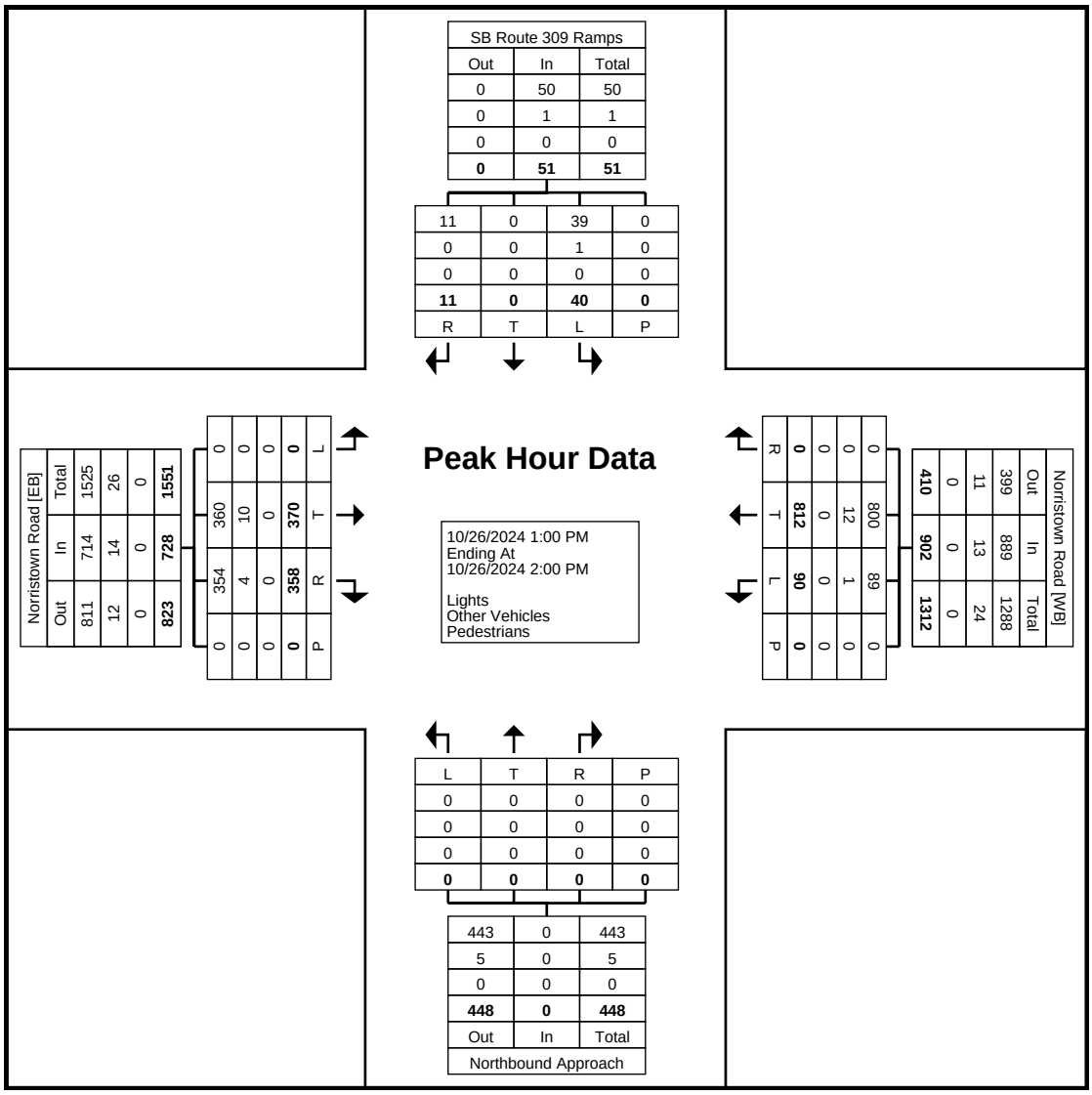
Turning Movement Peak Hour Data (1:00 PM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound					Northbound Approach Northbound						SB Route 309 Ramps Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
1:00 PM	0	101	97	5	0	203	29	213	0	0	242	0	0	0	0	0	0	8	0	0	1	0	9	454
1:15 PM	0	104	75	16	0	195	17	202	0	0	219	0	0	0	0	0	0	16	0	2	0	0	18	432
1:30 PM	0	82	67	11	0	160	19	196	0	0	215	0	0	0	0	0	0	10	0	3	1	0	14	389
1:45 PM	0	83	73	14	0	170	25	201	0	0	226	0	0	0	0	0	0	6	0	2	2	0	10	406
Total	0	370	312	46	0	728	90	812	0	0	902	0	0	0	0	0	0	40	0	7	4	0	51	1681
Approach %	0.0	50.8	42.9	6.3	-	-	10.0	90.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	78.4	0.0	13.7	7.8	-	-	-
Total %	0.0	22.0	18.6	2.7	-	43.3	5.4	48.3	0.0	-	53.7	0.0	0.0	0.0	0.0	-	0.0	2.4	0.0	0.4	0.2	-	3.0	-
PHF	0.000	0.889	0.804	0.719	-	0.897	0.776	0.953	0.000	-	0.932	0.000	0.000	0.000	0.000	-	0.000	0.625	0.000	0.583	0.500	-	0.708	0.926
Lights	0	360	308	46	-	714	89	800	0	-	889	0	0	0	0	-	0	39	0	7	4	-	50	1653
% Lights	-	97.3	98.7	100.0	-	98.1	98.9	98.5	-	-	98.6	-	-	-	-	-	-	97.5	-	100.0	100.0	-	98.0	98.3
Other Vehicles	0	10	4	0	-	14	1	12	0	-	13	0	0	0	0	-	0	1	0	0	0	-	1	28
% Other Vehicles	-	2.7	1.3	0.0	-	1.9	1.1	1.5	-	-	1.4	-	-	-	-	-	-	2.5	-	0.0	0.0	-	2.0	1.7
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 4 SB Route 309 Ramps & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 9



Turning Movement Peak Hour Data Plot (1:00 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 1

Turning Movement Data

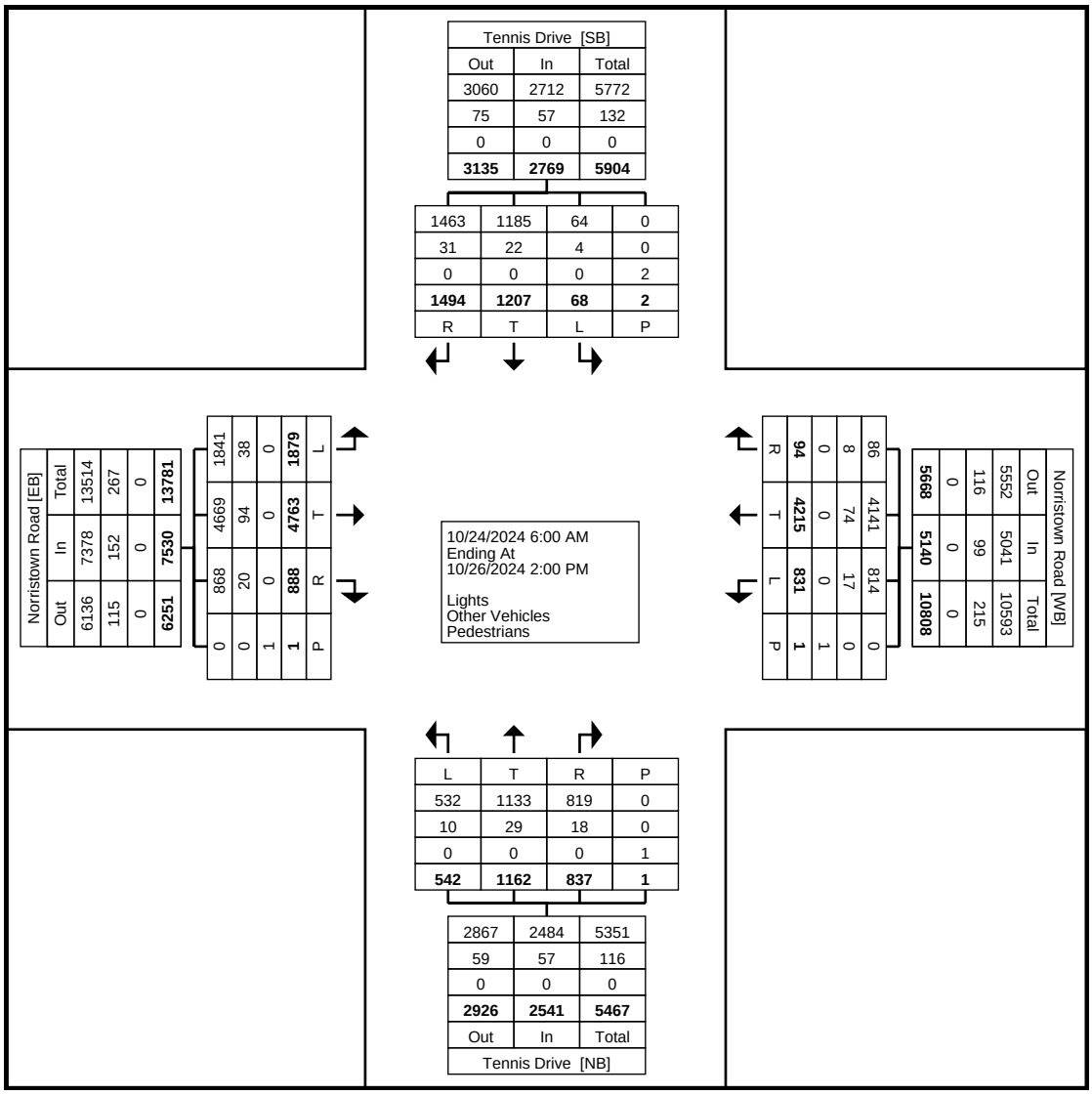
Start Time	Norristown Road Eastbound						Norristown Road Westbound						Tennis Drive Northbound						Tennis Drive Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
6:00 AM	12	36	2	0	0	50	6	55	0	0	0	61	3	4	2	4	0	13	0	1	7	4	0	12	136
6:15 AM	25	44	1	0	0	70	6	67	0	1	0	74	3	3	1	4	0	11	0	10	8	11	0	29	184
6:30 AM	23	84	3	0	0	110	7	76	0	0	0	83	5	9	1	3	0	18	0	14	6	5	0	25	236
6:45 AM	45	98	7	0	0	150	15	95	2	1	0	113	5	12	4	5	0	26	0	20	18	11	0	49	338
Hourly Total	105	262	13	0	0	380	34	293	2	2	0	331	16	28	8	16	0	68	0	45	39	31	0	115	894
7:00 AM	38	76	8	1	0	123	29	85	2	0	0	116	5	9	8	5	0	27	1	28	29	9	0	67	333
7:15 AM	40	80	5	0	0	125	26	86	2	0	0	114	14	18	19	6	0	57	0	32	40	8	0	80	376
7:30 AM	43	125	6	0	0	174	25	102	1	0	0	128	17	21	26	5	0	69	0	61	49	11	0	121	492
7:45 AM	75	89	6	1	0	171	33	119	1	0	0	153	12	23	7	4	0	46	1	43	39	9	0	92	462
Hourly Total	196	370	25	2	0	593	113	392	6	0	0	511	48	71	60	20	0	199	2	164	157	37	0	360	1663
8:00 AM	54	133	10	0	0	197	20	84	1	0	0	105	8	22	18	4	0	52	2	26	34	15	0	77	431
8:15 AM	43	117	15	1	0	176	25	91	0	1	1	117	10	28	21	3	0	62	0	36	30	7	1	73	428
8:30 AM	57	122	12	0	0	191	23	94	2	0	0	119	8	20	13	2	0	43	1	21	18	12	0	52	405
8:45 AM	54	106	14	1	0	175	23	94	2	0	0	119	17	24	11	4	0	56	3	28	35	7	0	73	423
Hourly Total	208	478	51	2	0	739	91	363	5	1	1	460	43	94	63	13	0	213	6	111	117	41	1	275	1687
9:00 AM	46	91	11	1	0	149	26	96	1	0	0	123	14	25	9	7	0	55	2	26	21	0	0	49	376
9:15 AM	37	89	15	0	0	141	20	95	2	1	0	118	10	19	6	2	0	37	4	24	29	2	1	59	355
9:30 AM	25	112	8	1	0	146	14	100	5	2	0	121	10	17	7	6	0	40	1	19	13	4	0	37	344
9:45 AM	22	96	11	1	0	130	15	100	4	1	0	120	11	13	8	3	0	35	3	21	19	8	0	51	336
Hourly Total	130	388	45	3	0	566	75	391	12	4	0	482	45	74	30	18	0	167	10	90	82	14	1	196	1411
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	45	154	148	2	0	349	21	86	2	0	0	109	11	33	14	7	0	65	0	30	24	11	0	65	588
3:15 PM	67	137	156	4	0	364	15	85	4	0	0	104	16	38	16	1	0	71	2	29	19	4	0	54	593
3:30 PM	56	104	59	1	0	220	21	102	5	0	0	128	12	44	17	7	0	80	3	34	31	12	0	80	508
3:45 PM	41	105	15	0	0	161	17	100	1	1	0	119	20	37	18	5	0	80	3	29	28	11	0	71	431
Hourly Total	209	500	378	7	0	1094	74	373	12	1	0	460	59	152	65	20	0	296	8	122	102	38	0	270	2120
4:00 PM	47	108	21	0	1	176	18	89	2	0	0	109	13	36	8	8	1	65	3	33	30	5	0	71	421
4:15 PM	37	118	14	0	0	169	15	115	3	0	0	133	17	41	15	14	0	87	2	35	49	2	0	88	477
4:30 PM	61	117	14	0	0	192	24	103	0	0	0	127	15	49	17	8	0	89	0	26	39	8	0	73	481
4:45 PM	49	100	15	0	0	164	26	112	1	0	0	139	10	35	17	8	0	70	1	44	42	6	0	93	466
Hourly Total	194	443	64	0	1	701	83	419	6	0	0	508	55	161	57	38	1	311	6	138	160	21	0	325	1845
5:00 PM	44	108	11	0	0	163	29	110	0	0	0	139	14	30	24	7	0	75	2	32	32	4	0	70	447
5:15 PM	54	100	23	1	0	178	25	94	2	0	0	121	10	42	21	10	0	83	2	35	37	8	0	82	464
5:30 PM	56	130	22	0	0	208	24	93	0	0	0	117	12	32	17	14	0	75	3	36	35	7	0	81	481
5:45 PM	74	113	12	1	0	200	29	96	2	0	0	127	16	46	12	13	0	87	2	37	22	10	0	71	485
Hourly Total	228	451	68	2	0	749	107	393	4	0	0	504	52	150	74	44	0	320	9	140	126	29	0	304	1877
6:00 PM	49	115	8	1	0	173	13	88	0	0	0	101	10	39	22	9	0	80	2	25	31	2	0	60	414
6:15 PM	45	109	13	0	0	167	14	82	0	1	0	97	10	38	12	9	0	69	1	22	24	5	0	52	385
6:30 PM	35	80	9	0	0	124	19	60	1	0	0	80	4	16	8	10	0	38	3	27	19	1	0	50	292
6:45 PM	35	79	13	1	0	128	14	62	2	0	0	78	10	17	0	10	0	37	1	18	10	3	0	32	275
Hourly Total	164	383	43	2	0	592	60	292	3	1	0	356	34	110	42	38	0	224	7	92	84	11	0	194	1366
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	18	81	7	1	0	107	7	56	2	0	0	65	8	23	9	9	0	49	0	19	14	7	0	40	261
10:15 AM	21	51	10	0	0	82	9	73	1	0	0	83	10	16	11	3	0	40	2	17	20	7	0	46	251
10:30 AM	25	94	13	0	0	132	12	68	3	1	0	84	8	17	10	4	0	39	0	26	36	3	0	65	320
10:45 AM	24	96	14	1	0	135	12	64	0	0	0	76	12	26	11	4	0	53	1	16	16	5	0	38	302
Hourly Total	88	322	44	2	0	456	40	261	6	1	0	308	38	82	41	20	0	181	3	78	86	22	0	189	1134
11:00 AM	23	86	17	1	0	127	10	75	3	0	0	88	20	20	7	6	0	53	2	20	17	6	0	45	313
11:15 AM	23	99	13	0	0	135	10	69	3	0	0	82	7	21	6	4	0	38	2	12	22	5	0	41	296
11:30 AM	21	94	9	0	0	124	7	75	4	0	0	86	9	12	12	7	0	40	0	22	23	6	0	51	301
11:45 AM	27	90	14	0	0	131	14	73	1	1	0	89	11	20	10	8	0	49	0	24	13	2	0	39	308
Hourly Total	94	369	53	1	0	517	41	292	11	1	0	345	47	73	35	25	0	180	4	78	75	19	0	176	1218
12:00 PM	26	121	8	0	0	155	15	90	0	1	0	106	16	21	11	1	0	49	3	24	20	7	0	54	364
12:15 PM	35	93	7	0	0	135	13	100	0	0	0	113	11	22	6	13	0	52	2	15	5	17	0	39	339
12:30 PM	35	81	11	1	0	128	14	104	3	0	0	121	12	24	12	1	0	49	1	19	16	9	0	45	343
12:45 PM	31	122	10	0	0	163	12	95	0	1	0	108	14	16	9	6	0	45	2	25	18	11	0	56	372
Hourly Total	127	417	36	1	0	581	54	389	3	2	0	448	53	83	38	21	0	195	8	83	59	44	0	194	1418
1:00 PM	27	112	12	1	0	152	16	99	1	0	0	116	10	13	8	4	0	35	0	20	20	10	0	50	353
1:15 PM	31	107	7	0	0	145	11	80	2	1	0	94	10	24	3	5	0	42	0	15	16	4	0	35	316

1:30 PM	32	85	18	0	0	135	22	91	4	2	0	119	17	24	9	10	0	60	2	14	13	9	0	38	352
1:45 PM	46	76	8	0	0	130	10	87	1	0	0	98	15	23	5	7	0	50	3	17	22	6	0	48	326
Hourly Total	136	380	45	1	0	562	59	357	8	3	0	427	52	84	25	26	0	187	5	66	71	29	0	171	1347
Grand Total	1879	4763	865	23	1	7530	831	4215	78	16	1	5140	542	1162	538	299	1	2541	68	1207	1158	336	2	2769	17980
Approach %	25.0	63.3	11.5	0.3	-	-	16.2	82.0	1.5	0.3	-	-	21.3	45.7	21.2	11.8	-	-	2.5	43.6	41.8	12.1	-	-	-
Total %	10.5	26.5	4.8	0.1	-	41.9	4.6	23.4	0.4	0.1	-	28.6	3.0	6.5	3.0	1.7	-	14.1	0.4	6.7	6.4	1.9	-	15.4	-
Lights	1841	4669	847	21	-	7378	814	4141	72	14	-	5041	532	1133	523	296	-	2484	64	1185	1132	331	-	2712	17615
% Lights	98.0	98.0	97.9	91.3	-	98.0	98.0	98.2	92.3	87.5	-	98.1	98.2	97.5	97.2	99.0	-	97.8	94.1	98.2	97.8	98.5	-	97.9	98.0
Other Vehicles	38	94	18	2	-	152	17	74	6	2	-	99	10	29	15	3	-	57	4	22	26	5	-	57	365
% Other Vehicles	2.0	2.0	2.1	8.7	-	2.0	2.0	1.8	7.7	12.5	-	1.9	1.8	2.5	2.8	1.0	-	2.2	5.9	1.8	2.2	1.5	-	2.1	2.0
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 3



Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024

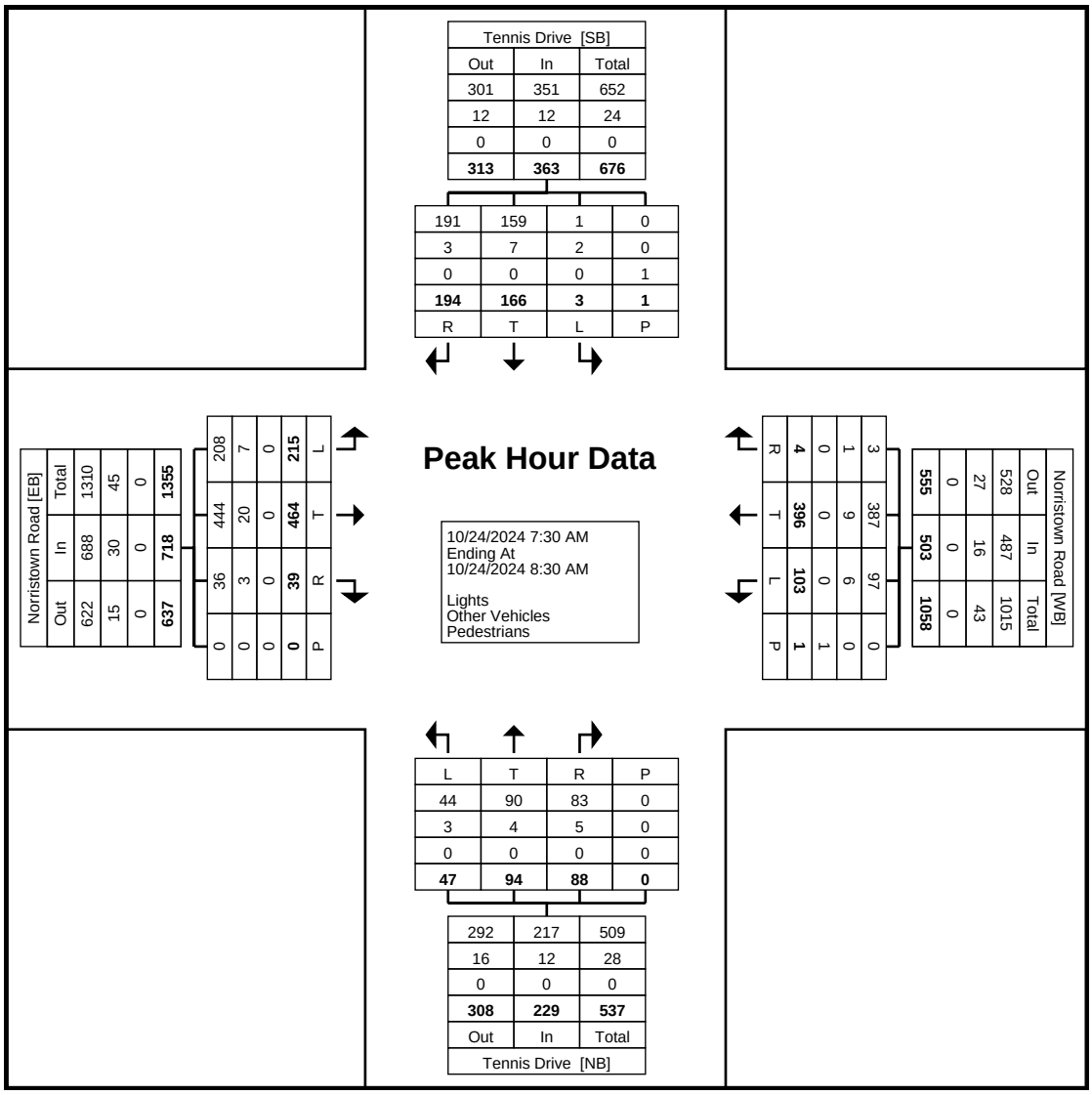
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound						Tennis Drive Northbound						Tennis Drive Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
7:30 AM	43	125	6	0	0	174	25	102	1	0	0	128	17	21	26	5	0	69	0	61	49	11	0	121	492
7:45 AM	75	89	6	1	0	171	33	119	1	0	0	153	12	23	7	4	0	46	1	43	39	9	0	92	462
8:00 AM	54	133	10	0	0	197	20	84	1	0	0	105	8	22	18	4	0	52	2	26	34	15	0	77	431
8:15 AM	43	117	15	1	0	176	25	91	0	1	1	117	10	28	21	3	0	62	0	36	30	7	1	73	428
Total	215	464	37	2	0	718	103	396	3	1	1	503	47	94	72	16	0	229	3	166	152	42	1	363	1813
Approach %	29.9	64.6	5.2	0.3	-	-	20.5	78.7	0.6	0.2	-	-	20.5	41.0	31.4	7.0	-	-	0.8	45.7	41.9	11.6	-	-	-
Total %	11.9	25.6	2.0	0.1	-	39.6	5.7	21.8	0.2	0.1	-	27.7	2.6	5.2	4.0	0.9	-	12.6	0.2	9.2	8.4	2.3	-	20.0	-
PHF	0.717	0.872	0.617	0.500	-	0.911	0.780	0.832	0.750	0.250	-	0.822	0.691	0.839	0.692	0.800	-	0.830	0.375	0.680	0.776	0.700	-	0.750	0.921
Lights	208	444	36	0	-	688	97	387	2	1	-	487	44	90	67	16	-	217	1	159	150	41	-	351	1743
% Lights	96.7	95.7	97.3	0.0	-	95.8	94.2	97.7	66.7	100.0	-	96.8	93.6	95.7	93.1	100.0	-	94.8	33.3	95.8	98.7	97.6	-	96.7	96.1
Other Vehicles	7	20	1	2	-	30	6	9	1	0	-	16	3	4	5	0	-	12	2	7	2	1	-	12	70
% Other Vehicles	3.3	4.3	2.7	100.0	-	4.2	5.8	2.3	33.3	0.0	-	3.2	6.4	4.3	6.9	0.0	-	5.2	66.7	4.2	1.3	2.4	-	3.3	3.9
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024

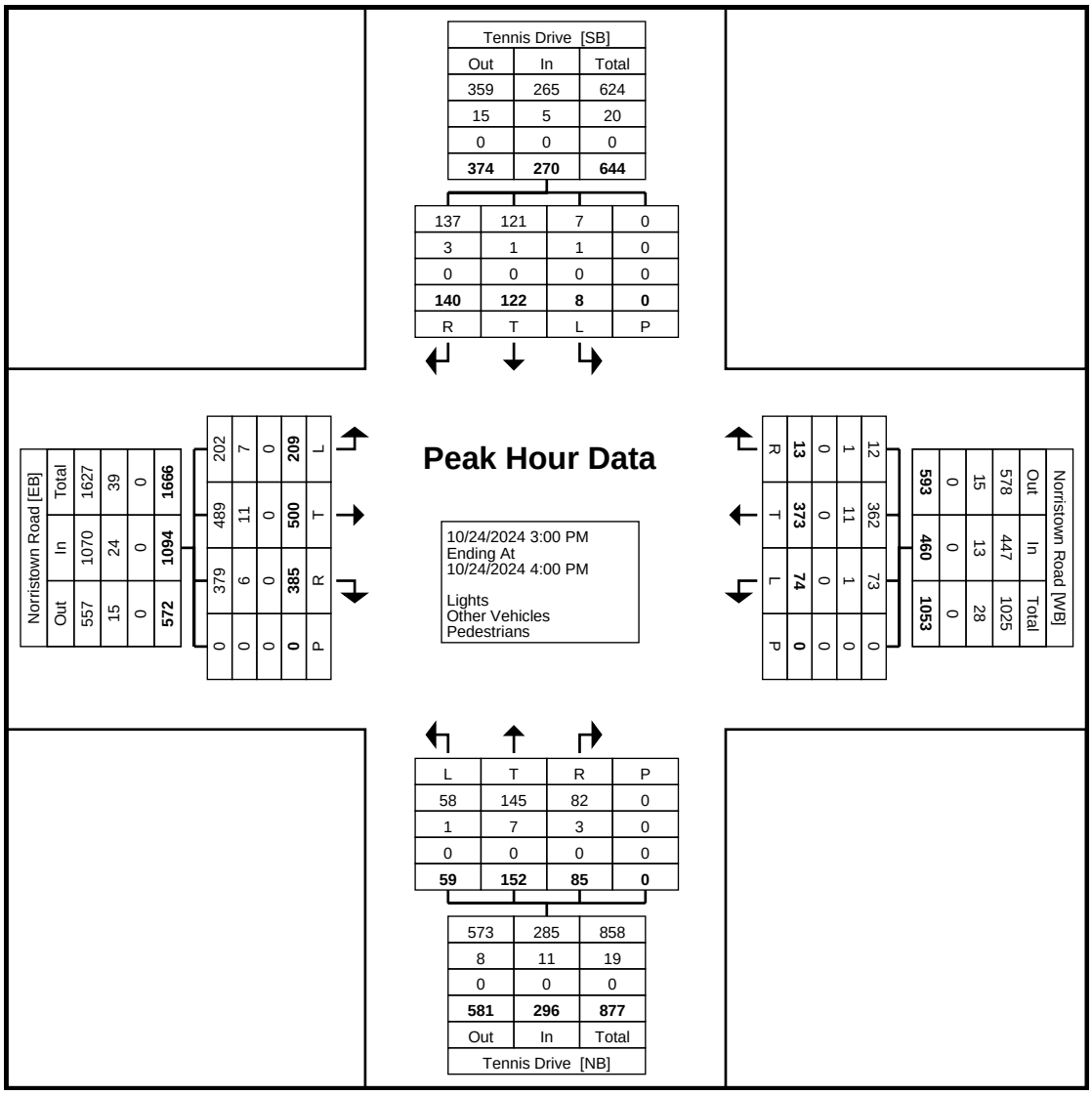
Turning Movement Peak Hour Data (3:00 PM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound						Tennis Drive Northbound						Tennis Drive Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
3:00 PM	45	154	148	2	0	349	21	86	2	0	0	109	11	33	14	7	0	65	0	30	24	11	0	65	588
3:15 PM	67	137	156	4	0	364	15	85	4	0	0	104	16	38	16	1	0	71	2	29	19	4	0	54	593
3:30 PM	56	104	59	1	0	220	21	102	5	0	0	128	12	44	17	7	0	80	3	34	31	12	0	80	508
3:45 PM	41	105	15	0	0	161	17	100	1	1	0	119	20	37	18	5	0	80	3	29	28	11	0	71	431
Total	209	500	378	7	0	1094	74	373	12	1	0	460	59	152	65	20	0	296	8	122	102	38	0	270	2120
Approach %	19.1	45.7	34.6	0.6	-	-	16.1	81.1	2.6	0.2	-	-	19.9	51.4	22.0	6.8	-	-	3.0	45.2	37.8	14.1	-	-	-
Total %	9.9	23.6	17.8	0.3	-	51.6	3.5	17.6	0.6	0.0	-	21.7	2.8	7.2	3.1	0.9	-	14.0	0.4	5.8	4.8	1.8	-	12.7	-
PHF	0.780	0.812	0.606	0.438	-	0.751	0.881	0.914	0.600	0.250	-	0.898	0.738	0.864	0.903	0.714	-	0.925	0.667	0.897	0.823	0.792	-	0.844	0.894
Lights	202	489	372	7	-	1070	73	362	11	1	-	447	58	145	64	18	-	285	7	121	99	38	-	265	2067
% Lights	96.7	97.8	98.4	100.0	-	97.8	98.6	97.1	91.7	100.0	-	97.2	98.3	95.4	98.5	90.0	-	96.3	87.5	99.2	97.1	100.0	-	98.1	97.5
Other Vehicles	7	11	6	0	-	24	1	11	1	0	-	13	1	7	1	2	-	11	1	1	3	0	-	5	53
% Other Vehicles	3.3	2.2	1.6	0.0	-	2.2	1.4	2.9	8.3	0.0	-	2.8	1.7	4.6	1.5	10.0	-	3.7	12.5	0.8	2.9	0.0	-	1.9	2.5
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 7



Turning Movement Peak Hour Data Plot (3:00 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024

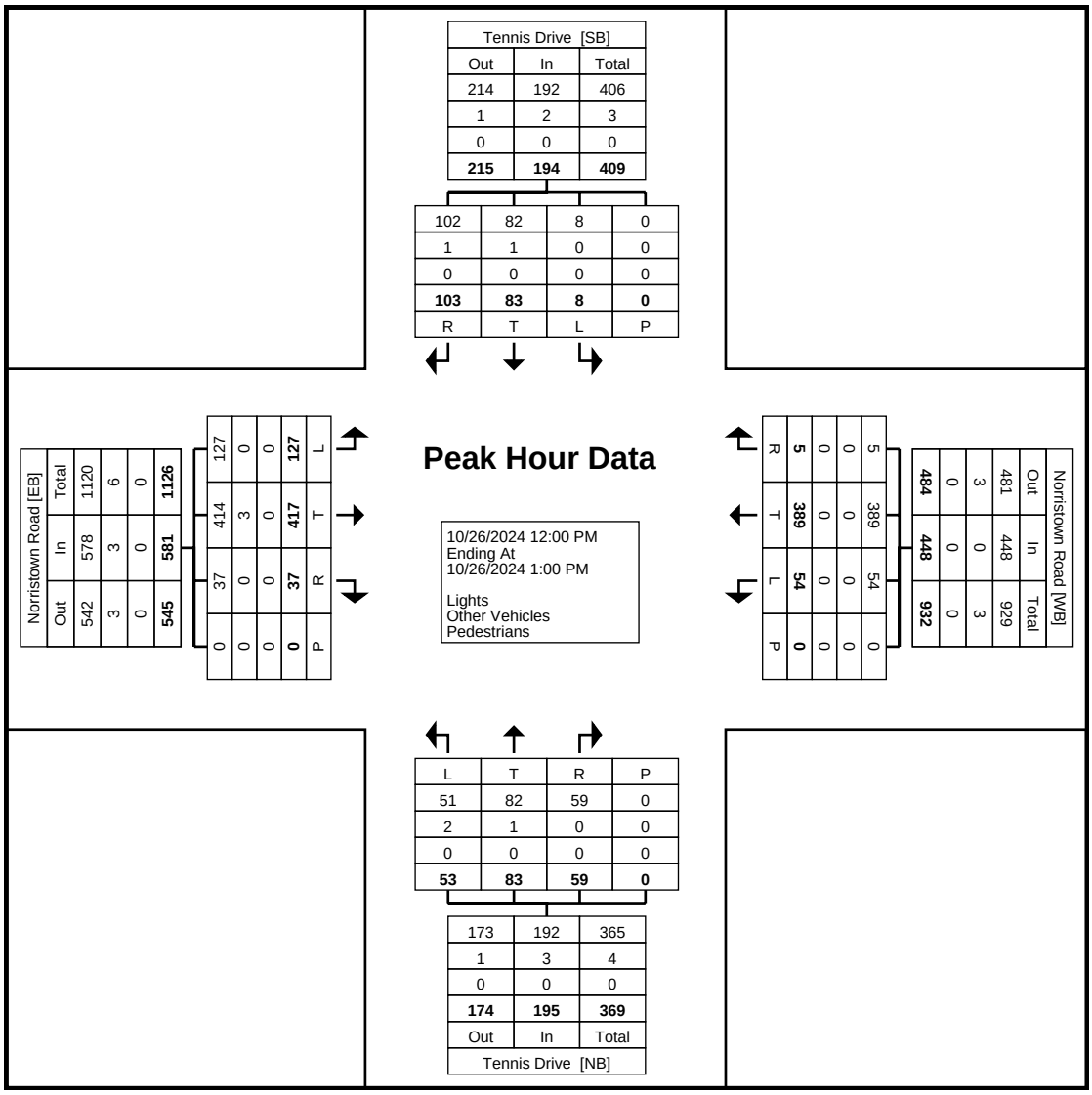
Turning Movement Peak Hour Data (12:00 PM)

	Norristown Road Eastbound						Norristown Road Westbound						Tennis Drive Northbound						Tennis Drive Southbound						
Start Time	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
12:00 PM	26	121	8	0	0	155	15	90	0	1	0	106	16	21	11	1	0	49	3	24	20	7	0	54	364
12:15 PM	35	93	7	0	0	135	13	100	0	0	0	113	11	22	6	13	0	52	2	15	5	17	0	39	339
12:30 PM	35	81	11	1	0	128	14	104	3	0	0	121	12	24	12	1	0	49	1	19	16	9	0	45	343
12:45 PM	31	122	10	0	0	163	12	95	0	1	0	108	14	16	9	6	0	45	2	25	18	11	0	56	372
Total	127	417	36	1	0	581	54	389	3	2	0	448	53	83	38	21	0	195	8	83	59	44	0	194	1418
Approach %	21.9	71.8	6.2	0.2	-	-	12.1	86.8	0.7	0.4	-	-	27.2	42.6	19.5	10.8	-	-	4.1	42.8	30.4	22.7	-	-	-
Total %	9.0	29.4	2.5	0.1	-	41.0	3.8	27.4	0.2	0.1	-	31.6	3.7	5.9	2.7	1.5	-	13.8	0.6	5.9	4.2	3.1	-	13.7	-
PHF	0.907	0.855	0.818	0.250	-	0.891	0.900	0.935	0.250	0.500	-	0.926	0.828	0.865	0.792	0.404	-	0.938	0.667	0.830	0.738	0.647	-	0.866	0.953
Lights	127	414	36	1	-	578	54	389	3	2	-	448	51	82	38	21	-	192	8	82	58	44	-	192	1410
% Lights	100.0	99.3	100.0	100.0	-	99.5	100.0	100.0	100.0	100.0	-	100.0	96.2	98.8	100.0	100.0	-	98.5	100.0	98.8	98.3	100.0	-	99.0	99.4
Other Vehicles	0	3	0	0	-	3	0	0	0	0	-	0	2	1	0	0	-	3	0	1	1	0	-	2	8
% Other Vehicles	0.0	0.7	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	-	0.0	3.8	1.2	0.0	0.0	-	1.5	0.0	1.2	1.7	0.0	-	1.0	0.6
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 5 Tennis Drive & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 9



Turning Movement Peak Hour Data Plot (12:00 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 1

Turning Movement Data

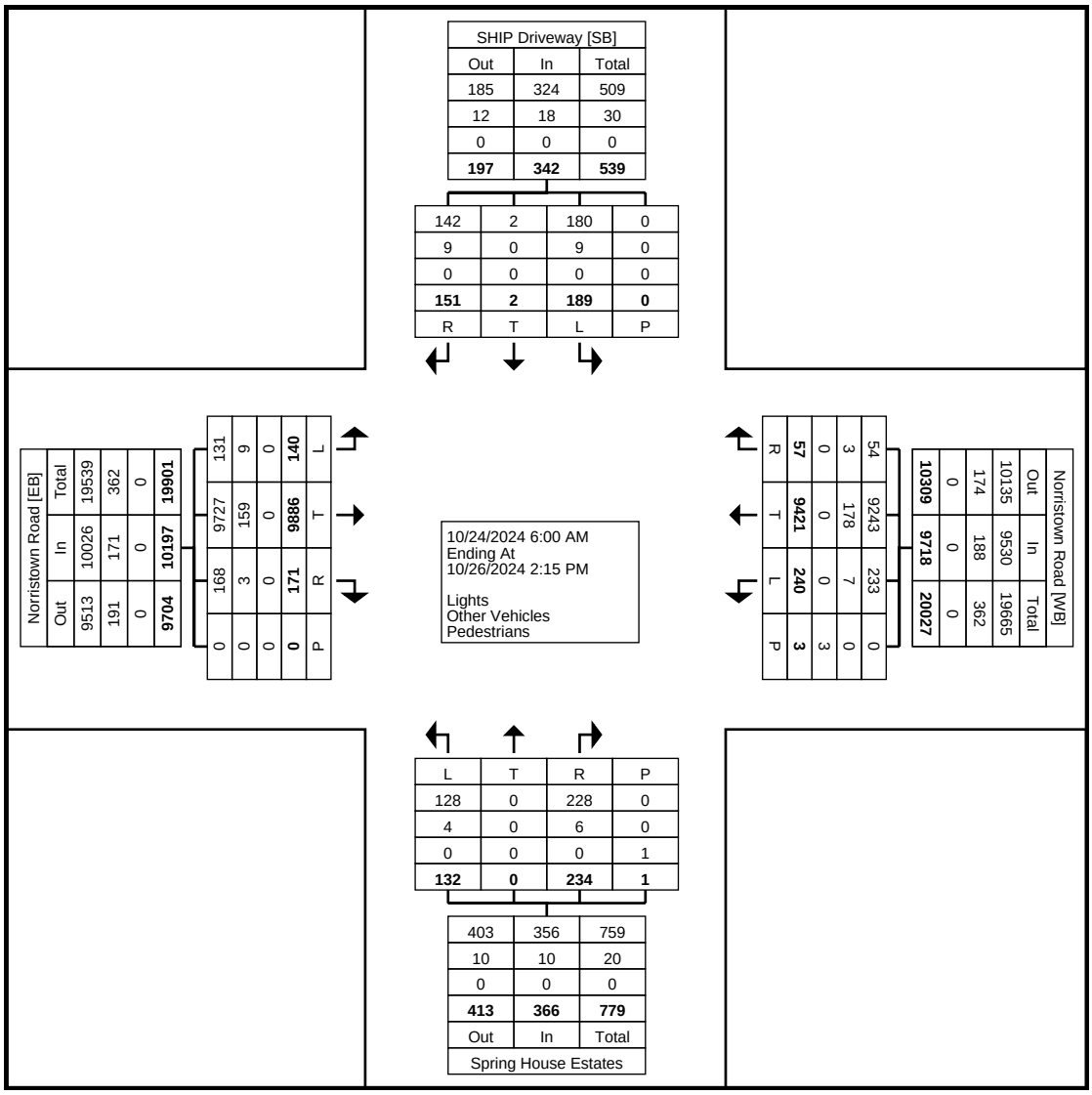
Start Time	Norristown Road Eastbound						Norristown Road Westbound						Spring House Estates Northbound						SHIP Driveway Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
6:00 AM	3	76	0	0	0	79	2	111	1	0	0	114	1	0	0	0	0	1	0	0	0	0	0	0	194
6:15 AM	7	115	2	0	0	124	3	159	3	0	0	165	0	0	0	0	0	0	1	0	0	0	0	1	290
6:30 AM	5	167	5	0	0	177	7	169	2	0	0	178	1	0	0	1	0	2	0	0	0	0	0	0	357
6:45 AM	4	170	3	0	0	177	13	182	5	0	0	200	3	0	0	0	0	3	1	1	1	2	0	5	385
Hourly Total	19	528	10	0	0	557	25	621	11	0	0	657	5	0	0	1	0	6	2	1	1	2	0	6	1226
7:00 AM	5	180	4	0	0	189	5	223	2	1	0	231	2	0	1	1	0	4	1	0	0	0	0	1	425
7:15 AM	5	239	4	0	0	248	4	232	6	0	0	242	0	0	0	4	0	4	0	0	1	0	0	1	495
7:30 AM	5	260	5	0	0	270	4	295	1	0	0	300	2	0	0	0	0	2	0	0	0	0	0	0	572
7:45 AM	8	219	6	1	0	234	3	290	5	0	0	298	1	0	1	1	0	3	2	0	1	1	0	4	539
Hourly Total	23	898	19	1	0	941	16	1040	14	1	0	1071	5	0	2	6	0	13	3	0	2	1	0	6	2031
8:00 AM	9	251	3	0	0	263	4	290	2	0	0	296	2	0	0	4	0	6	3	0	0	1	0	4	569
8:15 AM	5	233	6	0	0	244	6	265	2	0	0	273	2	0	2	2	0	6	2	0	0	2	0	4	527
8:30 AM	13	220	2	0	0	235	7	250	6	1	0	264	2	0	1	4	0	7	0	0	4	0	0	4	510
8:45 AM	15	229	3	0	0	247	8	253	1	0	0	262	2	0	0	1	0	3	4	0	3	1	0	8	520
Hourly Total	42	933	14	0	0	989	25	1058	11	1	0	1095	8	0	3	11	0	22	9	0	7	4	0	20	2126
9:00 AM	8	191	2	1	0	202	4	257	1	0	2	262	2	0	0	4	0	6	4	0	2	2	0	8	478
9:15 AM	10	177	2	0	0	189	3	257	2	0	0	262	1	0	1	2	0	4	3	0	0	1	0	4	459
9:30 AM	6	175	2	0	0	183	4	208	0	0	0	212	4	0	0	5	0	9	1	1	1	0	0	3	407
9:45 AM	9	173	5	1	0	188	8	215	3	0	0	226	6	0	3	3	0	12	2	0	1	2	0	5	431
Hourly Total	33	716	11	2	0	762	19	937	6	0	2	962	13	0	4	14	0	31	10	1	4	5	0	20	1775
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	263	6	2	0	271	6	259	2	0	0	267	8	0	6	7	0	21	10	0	1	5	0	16	575
3:15 PM	0	266	4	1	0	271	15	269	0	1	0	285	7	0	6	6	0	19	7	0	4	4	0	15	590
3:30 PM	1	228	3	1	0	233	7	182	0	0	0	189	4	0	3	10	0	17	5	0	3	1	0	9	448
3:45 PM	0	241	6	0	0	247	9	212	0	0	0	221	5	0	3	6	0	14	5	0	3	5	0	13	495
Hourly Total	1	998	19	4	0	1022	37	922	2	1	0	962	24	0	18	29	0	71	27	0	11	15	0	53	2108
4:00 PM	3	292	7	0	0	302	11	176	0	0	0	187	6	0	7	5	0	18	18	0	9	7	0	34	541
4:15 PM	1	294	4	1	0	300	7	211	1	0	0	219	7	0	10	3	0	20	9	0	0	7	0	16	555
4:30 PM	2	374	5	1	0	382	5	196	0	0	0	201	4	0	4	6	0	14	19	0	3	9	0	31	628
4:45 PM	1	265	2	0	0	268	3	239	1	0	0	243	0	0	4	3	0	7	7	0	6	5	0	18	536
Hourly Total	7	1225	18	2	0	1252	26	822	2	0	0	850	17	0	25	17	0	59	53	0	18	28	0	99	2260
5:00 PM	2	300	2	0	0	304	0	207	1	0	0	208	2	0	1	8	0	11	15	0	9	5	0	29	552
5:15 PM	0	301	1	0	0	302	1	179	0	0	0	180	2	0	1	2	0	5	18	0	6	3	0	27	514
5:30 PM	1	314	2	0	0	317	1	213	1	0	0	215	2	0	1	2	0	5	10	0	3	3	0	16	553
5:45 PM	0	240	7	0	0	247	1	224	1	1	0	227	1	0	1	1	0	3	9	0	2	2	0	13	490
Hourly Total	3	1155	12	0	0	1170	3	823	3	1	0	830	7	0	4	13	0	24	52	0	20	13	0	85	2109
6:00 PM	2	250	2	0	0	254	1	202	0	0	0	203	3	0	0	2	0	5	6	0	0	3	0	9	471
6:15 PM	1	226	2	0	0	229	2	176	0	0	0	178	1	0	1	2	0	4	5	0	0	0	0	5	416
6:30 PM	0	147	1	0	0	148	8	134	0	0	0	142	1	0	1	3	0	5	3	0	1	0	0	4	299
6:45 PM	1	145	6	0	0	152	4	153	0	0	0	157	6	0	1	6	0	13	4	0	0	2	0	6	328
Hourly Total	4	768	11	0	0	783	15	665	0	0	0	680	11	0	3	13	0	27	18	0	1	5	0	24	1514
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	1	159	2	0	0	162	7	110	1	0	0	118	3	0	0	4	0	7	0	0	0	0	0	0	287
10:15 AM	0	125	2	0	0	127	4	119	0	0	0	123	3	0	1	1	0	5	0	0	0	2	0	2	257
10:30 AM	1	180	3	0	0	184	4	135	0	0	0	139	7	0	1	3	0	11	0	0	0	1	0	1	335
10:45 AM	2	166	3	1	0	172	1	136	0	0	0	137	3	0	4	2	1	9	1	0	0	1	0	2	320
Hourly Total	4	630	10	1	0	645	16	500	1	0	0	517	16	0	6	10	1	32	1	0	0	4	0	5	1199
11:00 AM	2	153	5	0	0	160	5	150	1	0	0	156	2	0	2	4	0	8	1	0	3	1	0	5	329
11:15 AM	1	158	0	0	0	159	8	130	0	0	0	138	2	0	0	4	0	6	3	0	1	2	0	6	309
11:30 AM	0	166	1	0	0	167	2	157	0	0	0	159	3	0	0	6	0	9	0	0	0	0	0	0	335
11:45 AM	0	179	6	0	0	185	2	163	0	0	0	165	0	0	0	5	0	5	0	0	0	0	0	0	355
Hourly Total	3	656	12	0	0	671	17	600	1	0	0	618	7	0	2	19	0	28	4	0	4	3	0	11	1328
12:00 PM	1	168	3	1	0	173	3	169	0	0	0	172	4	0	1	2	0	7	1	0	1	0	0	2	354
12:15 PM	0	165	4	0	0	169	5	179	1	0	0	185	2	0	0	2	0	4	2	0	1	0	0	3	361
12:30 PM	0	153	4	0	0	157	4	194	0	0	1	198	2	0	0	0	0	2	2	0	0	0	0	2	359
12:45 PM	0	189	3	0	0	192	3	177	0	0	0	180	1	0	1	2	0	4	0	0	0	0	0	0	376
Hourly Total	1	675	14	1	0	691	15	719	1	0	1	735	9	0	2	6	0	17	5	0	2	0	0	7	1450
1:00 PM	0	194	6	0	0	200	6	179	0	0	0	185	4	0	1	5	0	10	1	0	0	0	0	1	396
1:15 PM	0	191	2	0	0	193	7	181	0	0	0	188	1	0	1	4	0	6	4	0	0	0	0	4	391

1:30 PM	0	156	0	0	0	156	6	178	1	0	0	185	3	0	3	5	0	11	0	0	0	0	0	0	352
1:45 PM	0	163	2	0	0	165	7	176	0	0	0	183	2	0	4	3	0	9	0	0	0	1	0	1	358
Hourly Total	0	704	10	0	0	714	26	714	1	0	0	741	10	0	9	17	0	36	5	0	0	1	0	6	1497
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	140	9886	160	11	0	10197	240	9421	53	4	3	9718	132	0	78	156	1	366	189	2	70	81	0	342	20623
Approach %	1.4	97.0	1.6	0.1	-	-	2.5	96.9	0.5	0.0	-	-	36.1	0.0	21.3	42.6	-	-	55.3	0.6	20.5	23.7	-	-	-
Total %	0.7	47.9	0.8	0.1	-	49.4	1.2	45.7	0.3	0.0	-	47.1	0.6	0.0	0.4	0.8	-	1.8	0.9	0.0	0.3	0.4	-	1.7	-
Lights	131	9727	157	11	-	10026	233	9243	50	4	-	9530	128	0	76	152	-	356	180	2	63	79	-	324	20236
% Lights	93.6	98.4	98.1	100.0	-	98.3	97.1	98.1	94.3	100.0	-	98.1	97.0	-	97.4	97.4	-	97.3	95.2	100.0	90.0	97.5	-	94.7	98.1
Other Vehicles	9	159	3	0	-	171	7	178	3	0	-	188	4	0	2	4	-	10	9	0	7	2	-	18	387
% Other Vehicles	6.4	1.6	1.9	0.0	-	1.7	2.9	1.9	5.7	0.0	-	1.9	3.0	-	2.6	2.6	-	2.7	4.8	0.0	10.0	2.5	-	5.3	1.9
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 3



Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound						Spring House Estates Northbound						SHIP Driveway Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
7:30 AM	5	260	5	0	0	270	4	295	1	0	0	300	2	0	0	0	0	2	0	0	0	0	0	0	572
7:45 AM	8	219	6	1	0	234	3	290	5	0	0	298	1	0	1	1	0	3	2	0	1	1	0	4	539
8:00 AM	9	251	3	0	0	263	4	290	2	0	0	296	2	0	0	4	0	6	3	0	0	1	0	4	569
8:15 AM	5	233	6	0	0	244	6	265	2	0	0	273	2	0	2	2	0	6	2	0	0	2	0	4	527
Total	27	963	20	1	0	1011	17	1140	10	0	0	1167	7	0	3	7	0	17	7	0	1	4	0	12	2207
Approach %	2.7	95.3	2.0	0.1	-	-	1.5	97.7	0.9	0.0	-	-	41.2	0.0	17.6	41.2	-	-	58.3	0.0	8.3	33.3	-	-	-
Total %	1.2	43.6	0.9	0.0	-	45.8	0.8	51.7	0.5	0.0	-	52.9	0.3	0.0	0.1	0.3	-	0.8	0.3	0.0	0.0	0.2	-	0.5	-
PHF	0.750	0.926	0.833	0.250	-	0.936	0.708	0.966	0.500	0.000	-	0.973	0.875	0.000	0.375	0.438	-	0.708	0.583	0.000	0.250	0.500	-	0.750	0.965
Lights	27	926	19	1	-	973	16	1111	10	0	-	1137	7	0	2	6	-	15	6	0	1	4	-	11	2136
% Lights	100.0	96.2	95.0	100.0	-	96.2	94.1	97.5	100.0	-	-	97.4	100.0	-	66.7	85.7	-	88.2	85.7	-	100.0	100.0	-	91.7	96.8
Other Vehicles	0	37	1	0	-	38	1	29	0	0	-	30	0	0	1	1	-	2	1	0	0	0	-	1	71
% Other Vehicles	0.0	3.8	5.0	0.0	-	3.8	5.9	2.5	0.0	-	-	2.6	0.0	-	33.3	14.3	-	11.8	14.3	-	0.0	0.0	-	8.3	3.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

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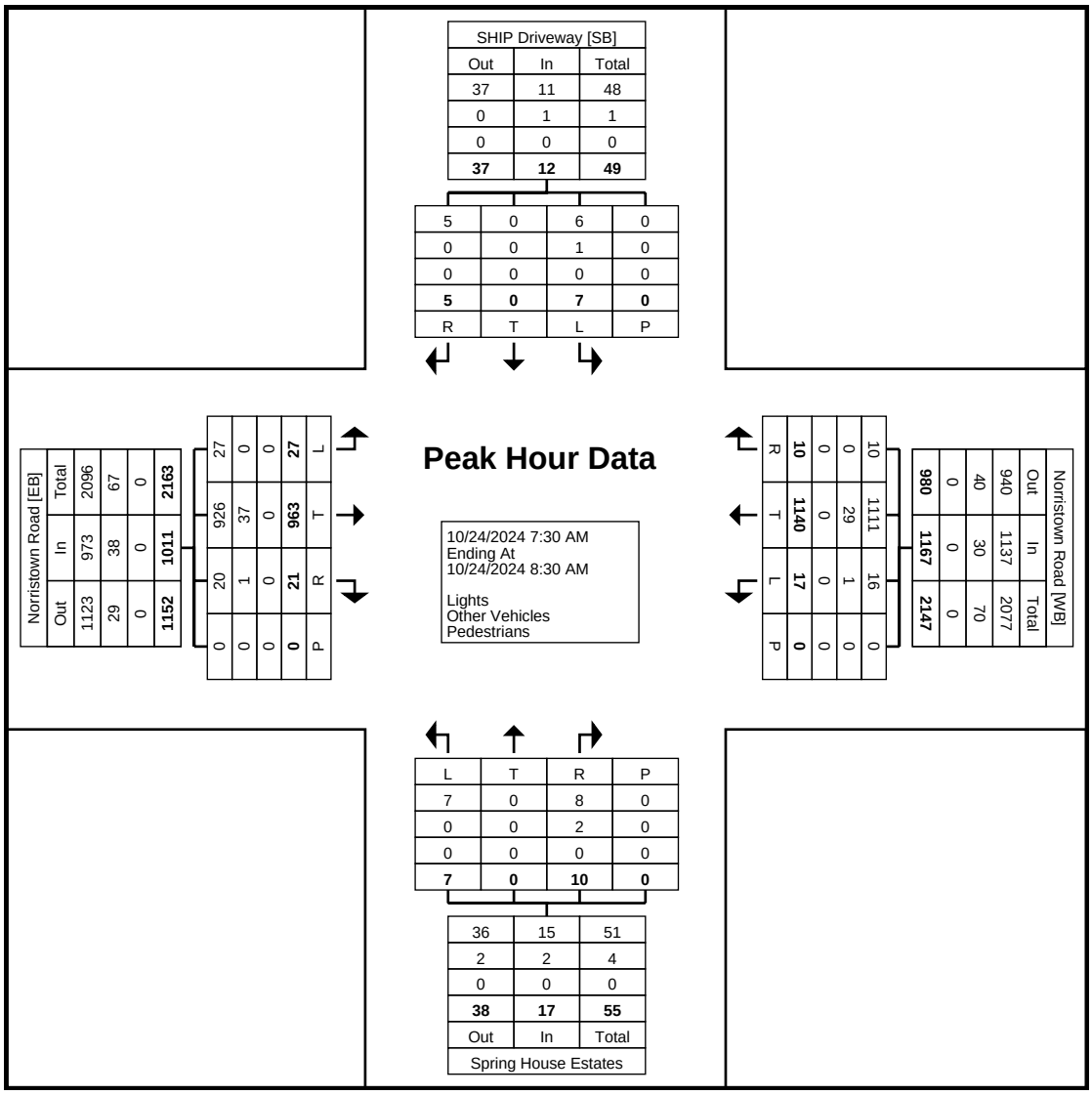
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 6

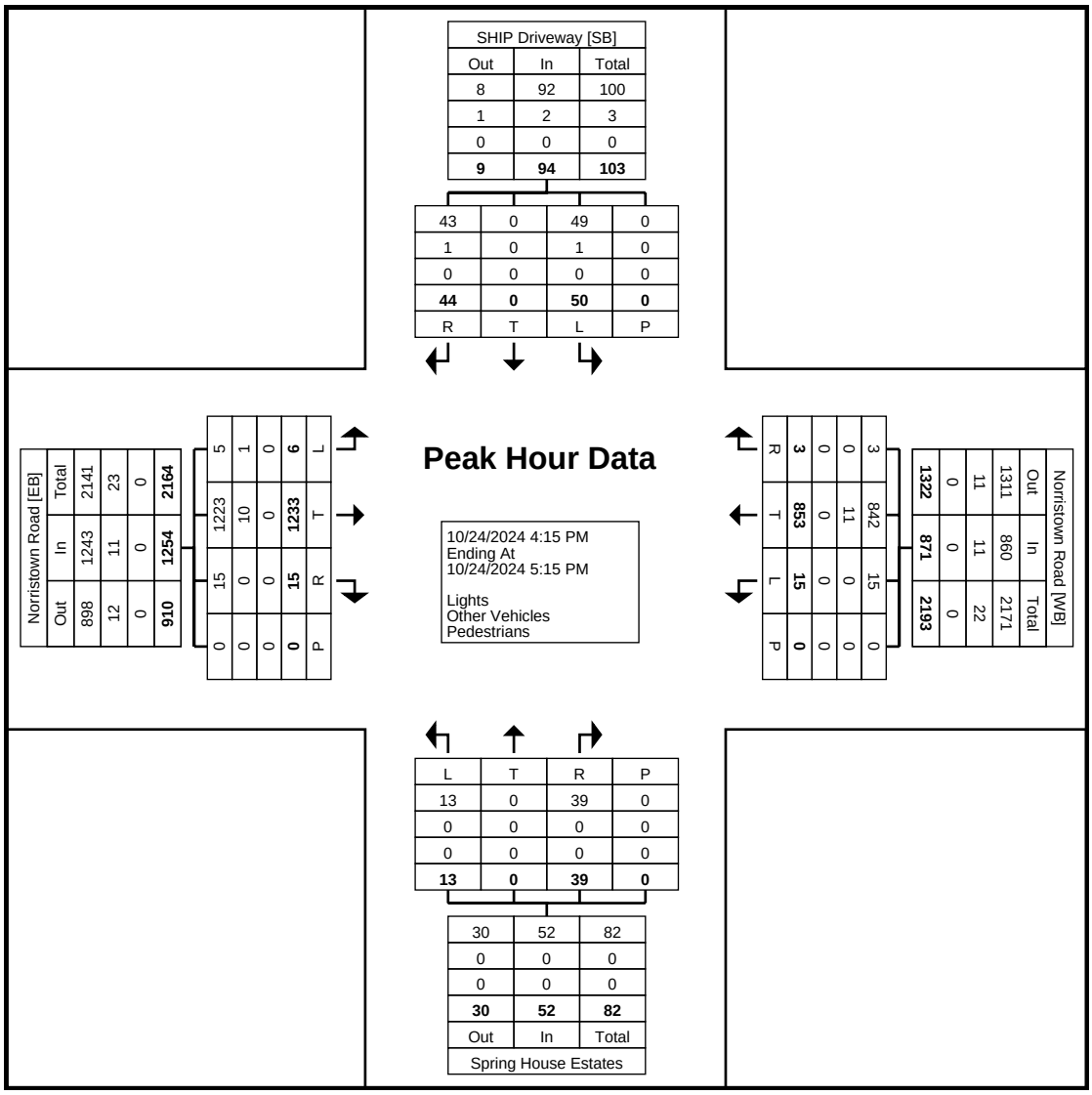
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound						Spring House Estates Northbound						SHIP Driveway Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
4:15 PM	1	294	4	1	0	300	7	211	1	0	0	219	7	0	10	3	0	20	9	0	0	7	0	16	555
4:30 PM	2	374	5	1	0	382	5	196	0	0	0	201	4	0	4	6	0	14	19	0	3	9	0	31	628
4:45 PM	1	265	2	0	0	268	3	239	1	0	0	243	0	0	4	3	0	7	7	0	6	5	0	18	536
5:00 PM	2	300	2	0	0	304	0	207	1	0	0	208	2	0	1	8	0	11	15	0	9	5	0	29	552
Total	6	1233	13	2	0	1254	15	853	3	0	0	871	13	0	19	20	0	52	50	0	18	26	0	94	2271
Approach %	0.5	98.3	1.0	0.2	-	-	1.7	97.9	0.3	0.0	-	-	25.0	0.0	36.5	38.5	-	-	53.2	0.0	19.1	27.7	-	-	-
Total %	0.3	54.3	0.6	0.1	-	55.2	0.7	37.6	0.1	0.0	-	38.4	0.6	0.0	0.8	0.9	-	2.3	2.2	0.0	0.8	1.1	-	4.1	-
PHF	0.750	0.824	0.650	0.500	-	0.821	0.536	0.892	0.750	0.000	-	0.896	0.464	0.000	0.475	0.625	-	0.650	0.658	0.000	0.500	0.722	-	0.758	0.904
Lights	5	1223	13	2	-	1243	15	842	3	0	-	860	13	0	19	20	-	52	49	0	17	26	-	92	2247
% Lights	83.3	99.2	100.0	100.0	-	99.1	100.0	98.7	100.0	-	-	98.7	100.0	-	100.0	100.0	-	100.0	98.0	-	94.4	100.0	-	97.9	98.9
Other Vehicles	1	10	0	0	-	11	0	11	0	0	-	11	0	0	0	0	-	0	1	0	1	0	-	2	24
% Other Vehicles	16.7	0.8	0.0	0.0	-	0.9	0.0	1.3	0.0	-	-	1.3	0.0	-	0.0	0.0	-	0.0	2.0	-	5.6	0.0	-	2.1	1.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 7



Turning Movement Peak Hour Data Plot (4:15 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 8

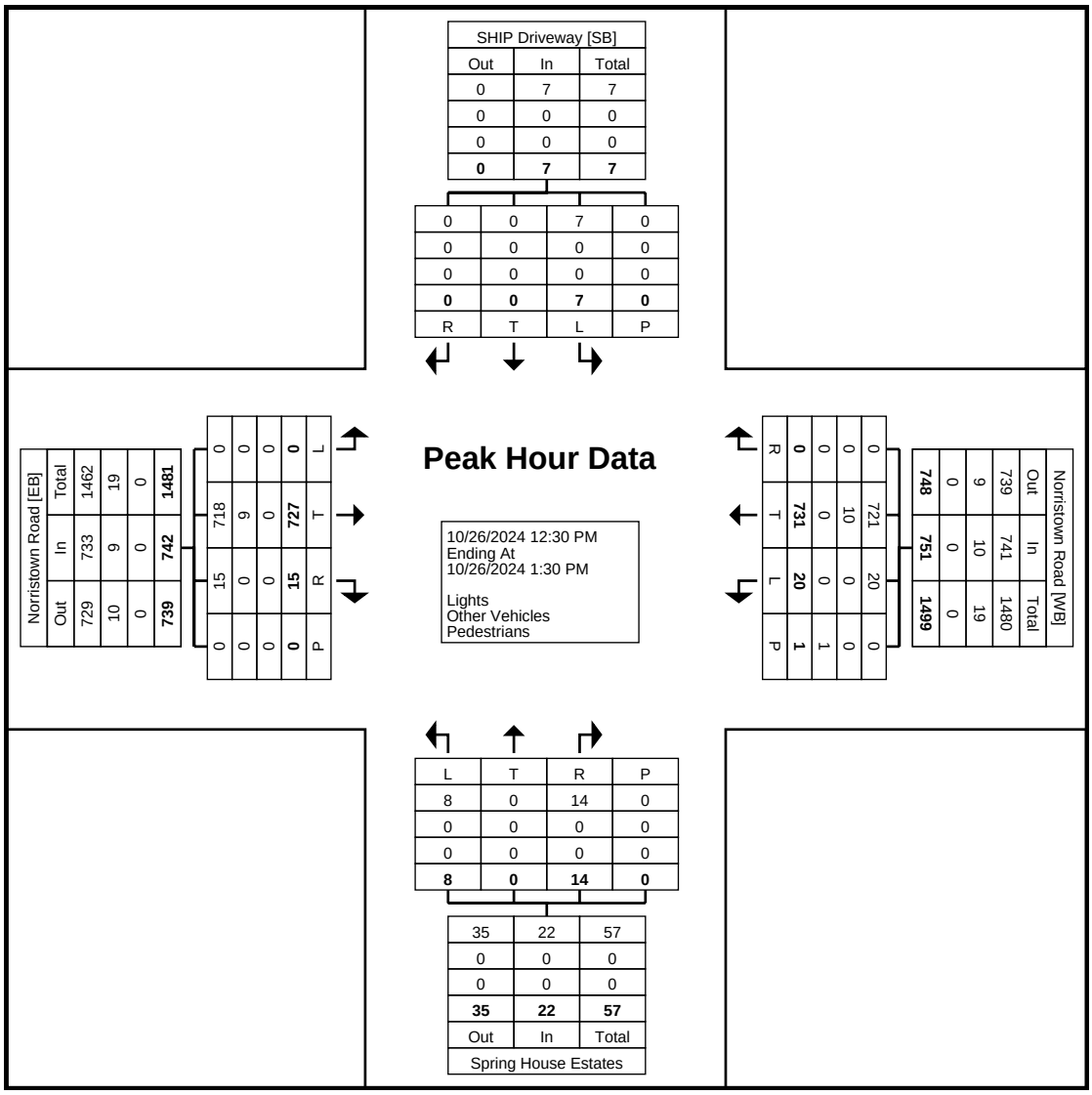
Turning Movement Peak Hour Data (12:30 PM)

Start Time	Norristown Road Eastbound						Norristown Road Westbound						Spring House Estates Northbound						SHIP Driveway Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
12:30 PM	0	153	4	0	0	157	4	194	0	0	1	198	2	0	0	0	0	2	2	0	0	0	0	2	359
12:45 PM	0	189	3	0	0	192	3	177	0	0	0	180	1	0	1	2	0	4	0	0	0	0	0	0	376
1:00 PM	0	194	6	0	0	200	6	179	0	0	0	185	4	0	1	5	0	10	1	0	0	0	0	1	396
1:15 PM	0	191	2	0	0	193	7	181	0	0	0	188	1	0	1	4	0	6	4	0	0	0	0	4	391
Total	0	727	15	0	0	742	20	731	0	0	1	751	8	0	3	11	0	22	7	0	0	0	0	7	1522
Approach %	0.0	98.0	2.0	0.0	-	-	2.7	97.3	0.0	0.0	-	-	36.4	0.0	13.6	50.0	-	-	100.0	0.0	0.0	0.0	-	-	-
Total %	0.0	47.8	1.0	0.0	-	48.8	1.3	48.0	0.0	0.0	-	49.3	0.5	0.0	0.2	0.7	-	1.4	0.5	0.0	0.0	0.0	-	0.5	-
PHF	0.000	0.937	0.625	0.000	-	0.928	0.714	0.942	0.000	0.000	-	0.948	0.500	0.000	0.750	0.550	-	0.550	0.438	0.000	0.000	0.000	-	0.438	0.961
Lights	0	718	15	0	-	733	20	721	0	0	-	741	8	0	3	11	-	22	7	0	0	0	-	7	1503
% Lights	-	98.8	100.0	-	-	98.8	100.0	98.6	-	-	-	98.7	100.0	-	100.0	100.0	-	100.0	100.0	-	-	-	-	100.0	98.8
Other Vehicles	0	9	0	0	-	9	0	10	0	0	-	10	0	0	0	0	-	0	0	0	0	0	-	0	19
% Other Vehicles	-	1.2	0.0	-	-	1.2	0.0	1.4	-	-	-	1.3	0.0	-	0.0	0.0	-	0.0	0.0	-	-	-	-	0.0	1.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 6 SHIP DW-Residential & Norristown Road
Site Code:
Start Date: 10/24/2024
Page No: 9



Turning Movement Peak Hour Data Plot (12:30 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 1

Turning Movement Data

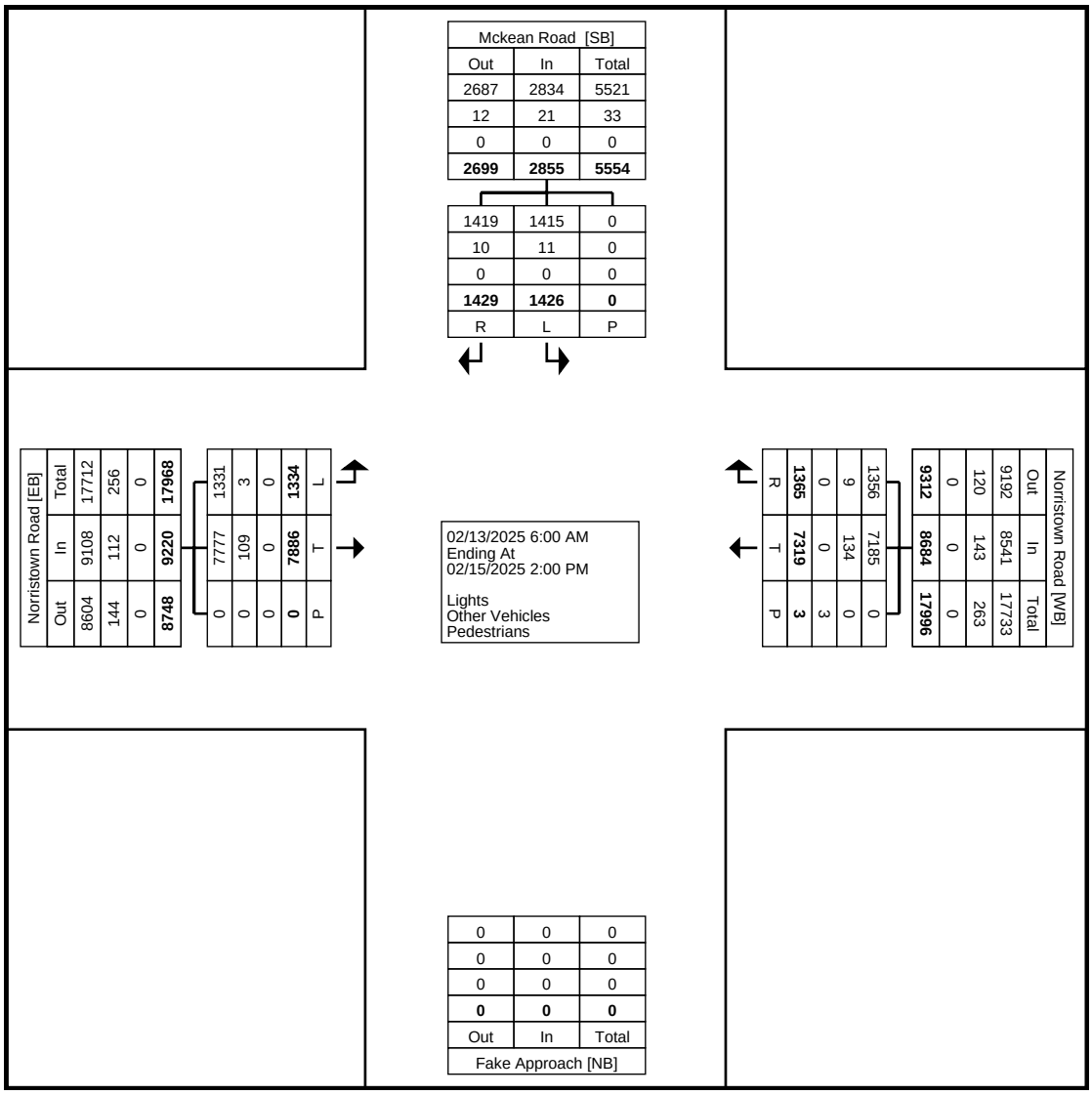
Start Time	Norristown Road Eastbound				Norristown Road Westbound					Mckean Road Southbound					Int. Total
	Left	Thru	Peds	App. Total	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	
6:00 AM	15	59	0	74	109	10	2	0	121	16	3	4	0	23	218
6:15 AM	19	84	0	103	133	5	2	0	140	17	3	6	0	26	269
6:30 AM	13	131	0	144	146	19	1	0	166	18	2	10	0	30	340
6:45 AM	22	165	0	187	146	15	0	0	161	24	4	14	0	42	390
Hourly Total	69	439	0	508	534	49	5	0	588	75	12	34	0	121	1217
7:00 AM	15	179	0	194	167	21	3	0	191	25	7	8	0	40	425
7:15 AM	32	200	0	232	177	27	5	0	209	39	4	19	0	62	503
7:30 AM	31	195	0	226	204	25	11	0	240	43	5	17	0	65	531
7:45 AM	56	224	0	280	191	71	12	0	274	45	16	24	0	85	639
Hourly Total	134	798	0	932	739	144	31	0	914	152	32	68	0	252	2098
8:00 AM	52	209	0	261	231	52	4	0	287	25	6	22	0	53	601
8:15 AM	42	187	0	229	167	46	6	0	219	22	4	15	0	41	489
8:30 AM	56	193	0	249	173	48	12	0	233	18	7	8	0	33	515
8:45 AM	56	183	0	239	180	47	6	0	233	37	2	12	0	51	523
Hourly Total	206	772	0	978	751	193	28	0	972	102	19	57	0	178	2128
9:00 AM	61	169	0	230	179	51	17	0	247	24	13	19	0	56	533
9:15 AM	44	153	0	197	180	39	15	0	234	27	10	17	0	54	485
9:30 AM	42	151	0	193	140	32	13	0	185	16	7	12	0	35	413
9:45 AM	29	153	0	182	137	25	13	0	175	21	6	13	0	40	397
Hourly Total	176	626	0	802	636	147	58	0	841	88	36	61	0	185	1828
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	19	165	0	184	170	15	7	0	192	34	17	17	0	68	444
3:15 PM	33	241	0	274	192	19	5	2	216	43	16	25	0	84	574
3:30 PM	31	200	0	231	181	20	3	0	204	32	17	19	0	68	503
3:45 PM	27	234	0	261	147	24	6	1	177	49	23	16	0	88	526
Hourly Total	110	840	0	950	690	78	21	3	789	158	73	77	0	308	2047
4:00 PM	26	251	0	277	196	12	6	0	214	59	27	24	0	110	601
4:15 PM	21	243	0	264	179	11	14	0	204	55	17	19	0	91	559
4:30 PM	31	262	0	293	216	11	21	0	248	50	23	16	0	89	630
4:45 PM	22	224	0	246	165	14	18	0	197	75	26	22	0	123	566
Hourly Total	100	980	0	1080	756	48	59	0	863	239	93	81	0	413	2356
5:00 PM	30	244	0	274	232	19	8	0	259	49	22	34	0	105	638
5:15 PM	22	237	0	259	168	21	7	0	196	50	23	27	0	100	555
5:30 PM	22	214	0	236	199	14	7	0	220	50	37	23	0	110	566
5:45 PM	21	158	0	179	183	34	3	0	220	33	32	27	0	92	491
Hourly Total	95	853	0	948	782	88	25	0	895	182	114	111	0	407	2250
6:00 PM	37	178	0	215	179	29	1	0	209	30	7	24	0	61	485
6:15 PM	21	162	0	183	131	14	5	0	150	26	18	18	0	62	395
6:30 PM	18	129	0	147	107	11	0	0	118	16	8	13	0	37	302
6:45 PM	20	122	0	142	96	7	5	0	108	19	15	21	0	55	305
Hourly Total	96	591	0	687	513	61	11	0	585	91	48	76	0	215	1487
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	19	91	0	110	100	7	14	0	121	24	12	20	0	56	287
10:15 AM	24	111	0	135	87	17	11	0	115	34	9	14	0	57	307
10:30 AM	25	117	0	142	99	8	13	0	120	20	8	18	0	46	308
10:45 AM	20	118	0	138	111	20	8	0	139	28	19	13	0	60	337
Hourly Total	88	437	0	525	397	52	46	0	495	106	48	65	0	219	1239
11:00 AM	18	128	0	146	134	16	3	0	153	18	16	13	0	47	346
11:15 AM	23	107	0	130	131	20	3	0	154	15	11	23	0	49	333
11:30 AM	24	124	0	148	123	13	14	0	150	21	9	13	0	43	341
11:45 AM	32	128	0	160	151	6	6	0	163	29	29	8	0	66	389
Hourly Total	97	487	0	584	539	55	26	0	620	83	65	57	0	205	1409
12:00 PM	22	115	0	137	126	9	6	0	141	28	26	9	0	63	341
12:15 PM	23	162	0	185	126	13	2	0	141	12	2	14	0	28	354
12:30 PM	16	129	0	145	126	14	5	0	145	21	13	14	0	48	338
12:45 PM	29	147	0	176	129	19	6	0	154	18	11	24	0	53	383
Hourly Total	90	553	0	643	507	55	19	0	581	79	52	61	0	192	1416
1:00 PM	16	138	0	154	125	15	7	0	147	21	12	12	0	45	346
1:15 PM	23	125	0	148	101	13	2	0	116	19	13	15	0	47	311
1:30 PM	19	118	0	137	134	8	4	0	146	15	10	14	0	39	322

1:45 PM	15	129	0	144	115	13	4	0	132	16	3	10	0	29	305
Hourly Total	73	510	0	583	475	49	17	0	541	71	38	51	0	160	1284
Grand Total	1334	7886	0	9220	7319	1019	346	3	8684	1426	630	799	0	2855	20759
Approach %	14.5	85.5	-	-	84.3	11.7	4.0	-	-	49.9	22.1	28.0	-	-	-
Total %	6.4	38.0	-	44.4	35.3	4.9	1.7	-	41.8	6.9	3.0	3.8	-	13.8	-
Lights	1331	7777	-	9108	7185	1012	344	-	8541	1415	625	794	-	2834	20483
% Lights	99.8	98.6	-	98.8	98.2	99.3	99.4	-	98.4	99.2	99.2	99.4	-	99.3	98.7
Other Vehicles	3	109	-	112	134	7	2	-	143	11	5	5	-	21	276
% Other Vehicles	0.2	1.4	-	1.2	1.8	0.7	0.6	-	1.6	0.8	0.8	0.6	-	0.7	1.3
Pedestrians	-	-	0	-	-	-	-	3	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 3



Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 4

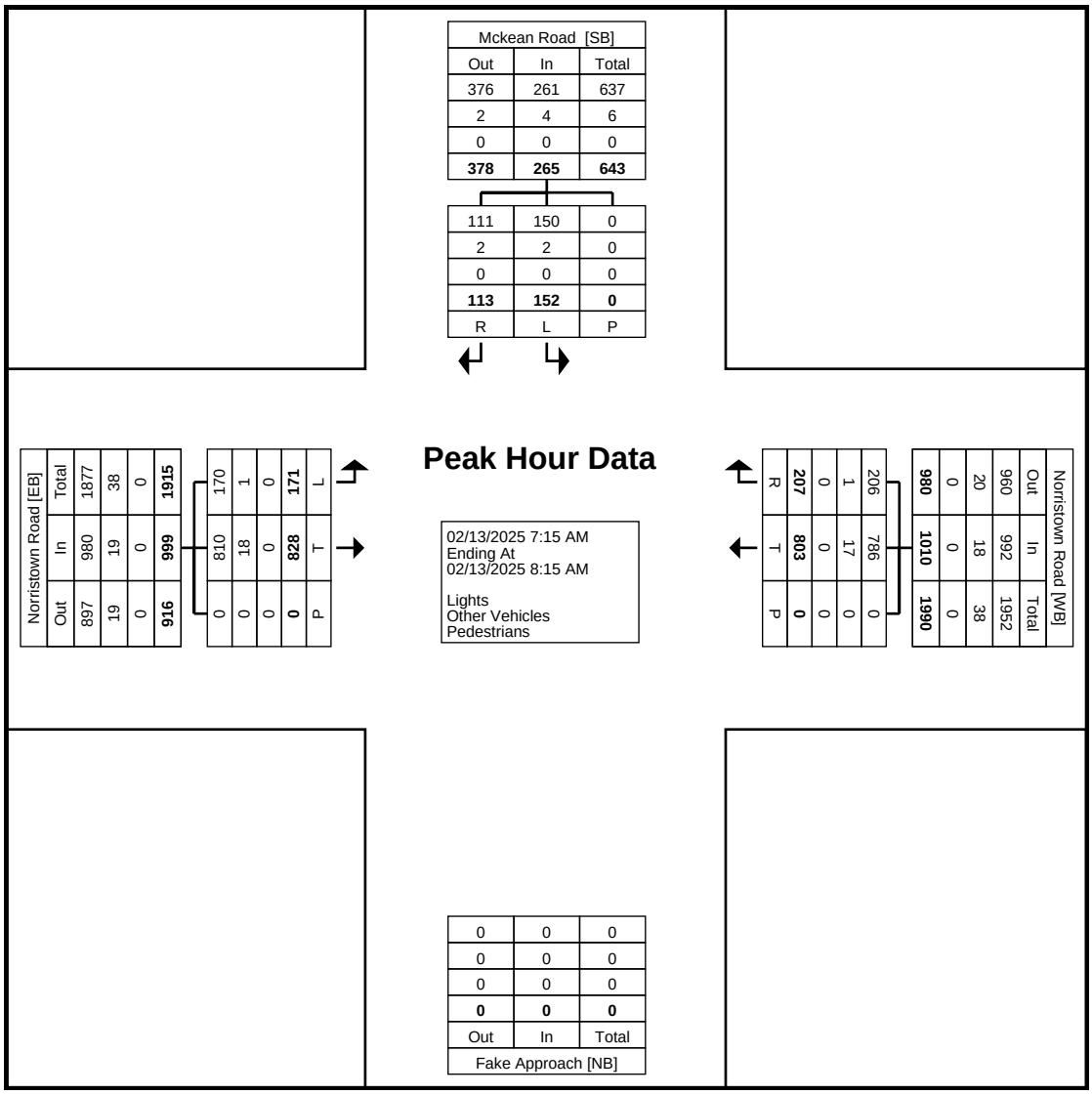
Turning Movement Peak Hour Data (7:15 AM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound					Mckean Road Southbound					
	Left	Thru	Peds	App. Total	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
7:15 AM	32	200	0	232	177	27	5	0	209	39	4	19	0	62	503
7:30 AM	31	195	0	226	204	25	11	0	240	43	5	17	0	65	531
7:45 AM	56	224	0	280	191	71	12	0	274	45	16	24	0	85	639
8:00 AM	52	209	0	261	231	52	4	0	287	25	6	22	0	53	601
Total	171	828	0	999	803	175	32	0	1010	152	31	82	0	265	2274
Approach %	17.1	82.9	-	-	79.5	17.3	3.2	-	-	57.4	11.7	30.9	-	-	-
Total %	7.5	36.4	-	43.9	35.3	7.7	1.4	-	44.4	6.7	1.4	3.6	-	11.7	-
PHF	0.763	0.924	-	0.892	0.869	0.616	0.667	-	0.880	0.844	0.484	0.854	-	0.779	0.890
Lights	170	810	-	980	786	175	31	-	992	150	31	80	-	261	2233
% Lights	99.4	97.8	-	98.1	97.9	100.0	96.9	-	98.2	98.7	100.0	97.6	-	98.5	98.2
Other Vehicles	1	18	-	19	17	0	1	-	18	2	0	2	-	4	41
% Other Vehicles	0.6	2.2	-	1.9	2.1	0.0	3.1	-	1.8	1.3	0.0	2.4	-	1.5	1.8
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound					Mckean Road Southbound					
	Left	Thru	Peds	App. Total	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
4:15 PM	21	243	0	264	179	11	14	0	204	55	17	19	0	91	559
4:30 PM	31	262	0	293	216	11	21	0	248	50	23	16	0	89	630
4:45 PM	22	224	0	246	165	14	18	0	197	75	26	22	0	123	566
5:00 PM	30	244	0	274	232	19	8	0	259	49	22	34	0	105	638
Total	104	973	0	1077	792	55	61	0	908	229	88	91	0	408	2393
Approach %	9.7	90.3	-	-	87.2	6.1	6.7	-	-	56.1	21.6	22.3	-	-	-
Total %	4.3	40.7	-	45.0	33.1	2.3	2.5	-	37.9	9.6	3.7	3.8	-	17.0	-
PHF	0.839	0.928	-	0.919	0.853	0.724	0.726	-	0.876	0.763	0.846	0.669	-	0.829	0.938
Lights	104	966	-	1070	783	55	61	-	899	228	88	91	-	407	2376
% Lights	100.0	99.3	-	99.4	98.9	100.0	100.0	-	99.0	99.6	100.0	100.0	-	99.8	99.3
Other Vehicles	0	7	-	7	9	0	0	-	9	1	0	0	-	1	17
% Other Vehicles	0.0	0.7	-	0.6	1.1	0.0	0.0	-	1.0	0.4	0.0	0.0	-	0.2	0.7
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

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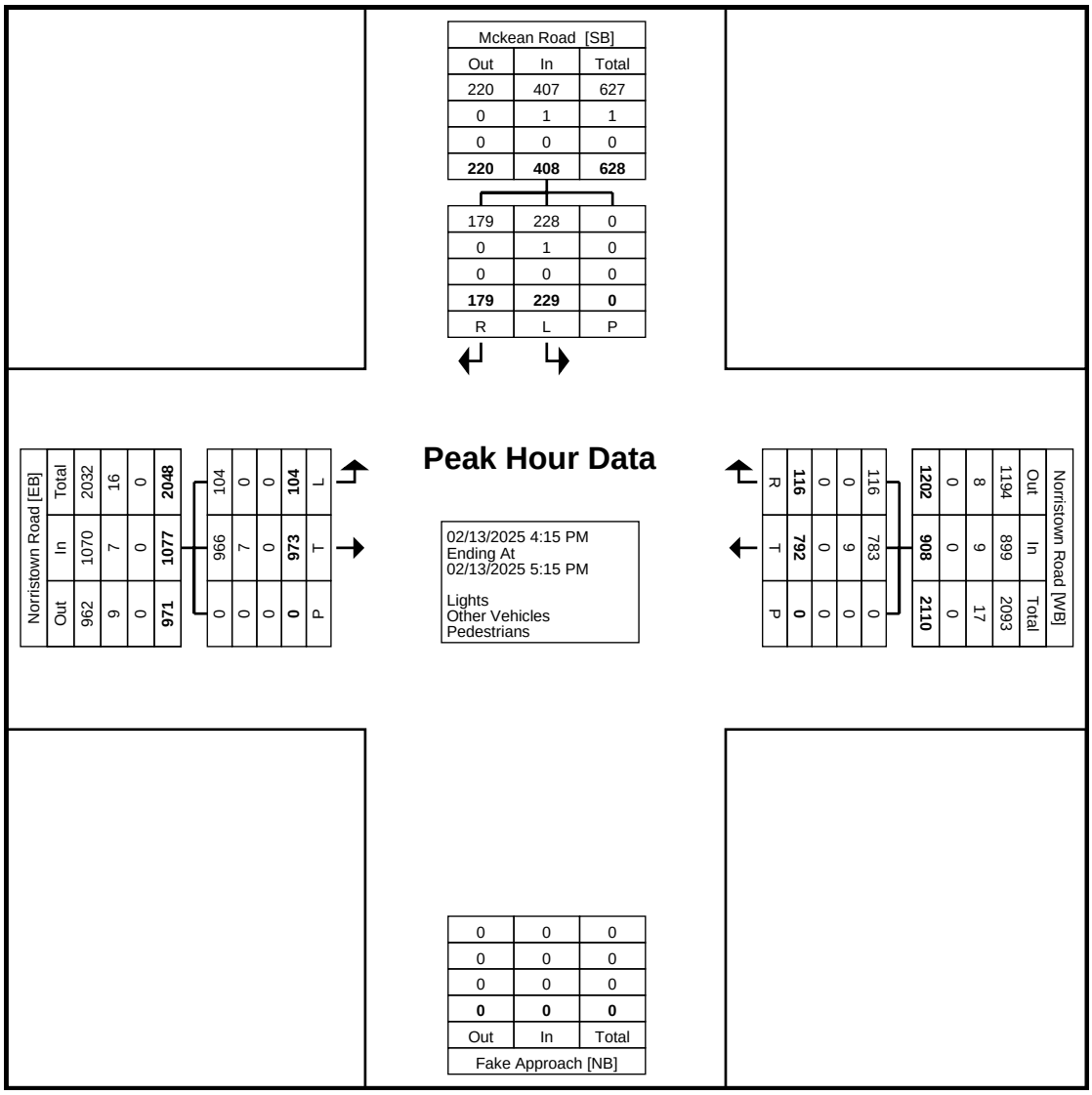
Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 7



Turning Movement Peak Hour Data Plot (4:15 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
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610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 8

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Norristown Road Eastbound				Norristown Road Westbound					Mckean Road Southbound					
	Left	Thru	Peds	App. Total	Thru	Right	Right on Red	Peds	App. Total	Left	Right	Right on Red	Peds	App. Total	Int. Total
11:30 AM	24	124	0	148	123	13	14	0	150	21	9	13	0	43	341
11:45 AM	32	128	0	160	151	6	6	0	163	29	29	8	0	66	389
12:00 PM	22	115	0	137	126	9	6	0	141	28	26	9	0	63	341
12:15 PM	23	162	0	185	126	13	2	0	141	12	2	14	0	28	354
Total	101	529	0	630	526	41	28	0	595	90	66	44	0	200	1425
Approach %	16.0	84.0	-	-	88.4	6.9	4.7	-	-	45.0	33.0	22.0	-	-	-
Total %	7.1	37.1	-	44.2	36.9	2.9	2.0	-	41.8	6.3	4.6	3.1	-	14.0	-
PHF	0.789	0.816	-	0.851	0.871	0.788	0.500	-	0.913	0.776	0.569	0.786	-	0.758	0.916
Lights	101	524	-	625	516	41	28	-	585	90	66	44	-	200	1410
% Lights	100.0	99.1	-	99.2	98.1	100.0	100.0	-	98.3	100.0	100.0	100.0	-	100.0	98.9
Other Vehicles	0	5	-	5	10	0	0	-	10	0	0	0	-	0	15
% Other Vehicles	0.0	0.9	-	0.8	1.9	0.0	0.0	-	1.7	0.0	0.0	0.0	-	0.0	1.1
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 007 Mckean Road & Norristown Road
Site Code:
Start Date: 02/13/2025
Page No: 9

Mckean Road [SB]		
Out	In	Total
170	200	370
0	0	0
0	0	0
170	**200**	**370**

110	90	0
0	0	0
0	0	0
110	**90**	**0**
R	L	P

Peak Hour Data

02/15/2025 11:30 AM
Ending At
02/15/2025 12:30 PM

Lights
Other Vehicles
Pedestrians

Norristown Road [EB]		
Out	In	Total
626	625	1251
10	5	15
0	0	0
636	**630**	**1266**

0	524	101
0	5	0
0	0	0
0	**529**	**101**
P	T	L

Norristown Road [WB]		
Out	In	Total
614	585	1199
5	10	15
0	0	0
619	**595**	**1214**

69	516	0
0	10	0
0	0	0
69	**526**	**0**
R	T	P

0	0	0
0	0	0
0	0	0
0	**0**	**0**
Out	In	Total
Fake Approach [NB]		

Turning Movement Peak Hour Data Plot (11:30 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025

Turning Movement Data

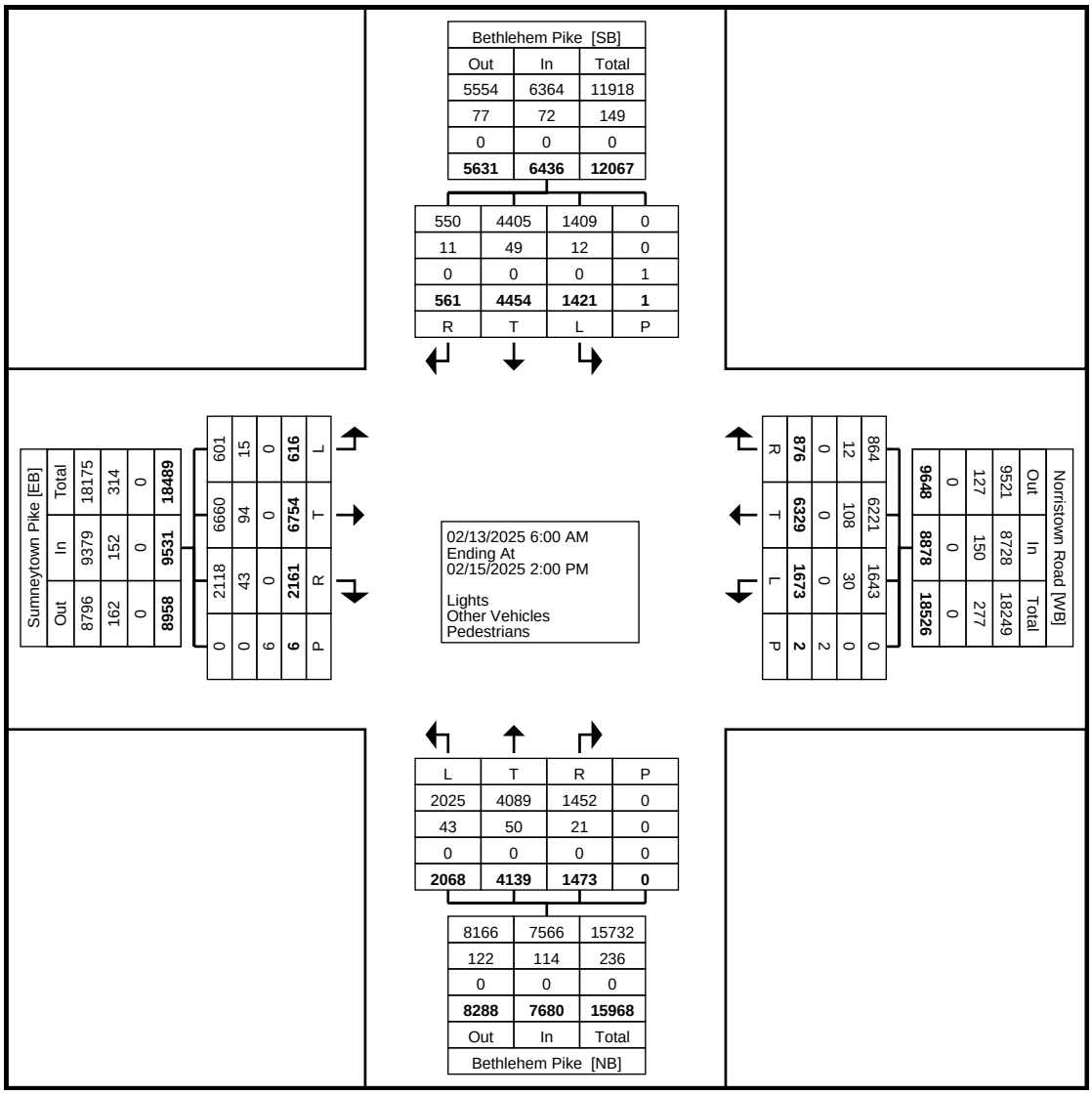
Start Time	Sumneytown Pike Eastbound						Norristown Road Westbound						Bethlehem Pike Northbound						Bethlehem Pike Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
6:00 AM	2	58	7	9	0	76	18	95	6	0	0	119	10	15	6	4	0	35	2	20	2	1	0	25	255
6:15 AM	2	88	12	3	0	105	19	142	3	0	0	164	8	19	9	7	0	43	9	16	2	2	0	29	341
6:30 AM	6	128	6	11	0	151	17	123	3	0	0	143	23	26	5	9	0	63	9	33	0	1	0	43	400
6:45 AM	10	160	28	10	0	208	35	130	7	0	0	172	32	33	13	10	0	88	14	68	0	5	0	87	555
Hourly Total	20	434	53	33	0	540	89	490	19	0	0	598	73	93	33	30	0	229	34	137	4	9	0	184	1551
7:00 AM	7	156	59	24	0	246	35	135	6	0	0	176	26	46	11	12	0	95	10	98	4	4	0	116	633
7:15 AM	8	212	81	29	0	330	32	158	11	0	0	201	46	39	23	13	0	121	13	111	7	2	0	133	785
7:30 AM	10	190	44	12	0	256	32	191	5	0	0	228	52	61	30	15	0	158	19	82	5	9	0	115	757
7:45 AM	13	214	43	16	0	286	41	153	18	0	0	212	58	74	28	6	0	166	25	98	10	9	0	142	806
Hourly Total	38	772	227	81	0	1118	140	637	40	0	0	817	182	220	92	46	0	540	67	389	26	24	0	506	2981
8:00 AM	18	212	42	19	0	291	37	199	10	0	0	246	48	91	25	14	0	178	30	104	9	6	0	149	864
8:15 AM	19	190	39	15	0	263	43	133	11	0	0	187	48	55	30	8	0	141	15	110	0	9	0	134	725
8:30 AM	14	190	36	5	0	245	29	180	6	1	0	216	54	90	31	12	0	187	26	83	6	9	0	124	772
8:45 AM	15	221	40	11	0	287	28	177	11	0	1	216	40	58	17	19	0	134	24	91	11	12	0	138	775
Hourly Total	66	813	157	50	0	1086	137	689	38	1	1	865	190	294	103	53	0	640	95	388	26	36	0	545	3136
9:00 AM	8	155	36	12	0	211	44	157	18	1	0	220	41	77	25	14	0	157	28	78	4	4	0	114	702
9:15 AM	10	145	46	11	1	212	40	145	14	0	0	199	37	65	36	6	0	144	25	88	2	3	0	118	673
9:30 AM	12	123	38	8	0	181	36	108	15	0	0	159	38	83	22	20	0	163	20	76	5	6	0	107	610
9:45 AM	9	150	37	6	0	202	33	112	18	0	0	163	34	84	24	6	0	148	17	79	7	5	0	108	621
Hourly Total	39	573	157	37	1	806	153	522	65	1	0	741	150	309	107	46	0	612	90	321	18	18	0	447	2606
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	13	167	47	16	0	243	32	146	20	0	0	198	59	129	28	7	0	223	39	91	18	7	1	155	819
3:15 PM	19	207	40	22	0	288	40	170	32	1	0	243	72	108	28	4	0	212	37	112	7	7	0	163	906
3:30 PM	10	175	37	6	0	228	34	166	29	0	0	229	62	121	33	1	0	217	37	76	6	7	0	126	800
3:45 PM	8	215	35	7	1	265	46	123	18	0	0	187	44	87	34	5	0	170	49	92	13	4	0	158	780
Hourly Total	50	764	159	51	1	1024	152	605	99	1	0	857	237	445	123	17	0	822	162	371	44	25	1	602	3305
4:00 PM	12	205	42	10	0	269	53	167	36	0	0	256	48	107	16	13	0	184	48	95	12	5	0	160	869
4:15 PM	11	219	34	17	1	281	31	166	22	0	0	219	58	97	30	5	0	190	34	95	7	10	0	146	836
4:30 PM	11	193	31	13	0	248	44	206	21	0	0	271	56	107	48	4	0	215	41	102	4	5	0	152	886
4:45 PM	18	208	39	6	0	271	45	159	18	0	0	222	54	112	24	11	0	201	34	106	5	8	0	153	847
Hourly Total	52	825	146	46	1	1069	173	698	97	0	0	968	216	423	118	33	0	790	157	398	28	28	0	611	3438
5:00 PM	12	171	41	17	1	241	58	206	22	0	0	286	60	140	37	5	0	242	47	104	7	5	0	163	932
5:15 PM	19	192	35	13	0	259	55	155	19	0	1	229	55	120	40	15	0	230	33	110	6	2	0	151	869
5:30 PM	21	163	39	10	0	233	53	182	19	0	0	254	46	111	30	2	0	189	42	117	11	4	0	174	850
5:45 PM	17	141	49	4	0	211	65	141	30	0	0	236	44	95	22	7	0	168	22	107	4	3	0	136	751
Hourly Total	69	667	164	44	1	944	231	684	90	0	1	1005	205	466	129	29	0	829	144	438	28	14	0	624	3402
6:00 PM	13	142	25	16	0	196	34	146	29	0	0	209	40	110	30	8	0	188	26	94	5	9	0	134	727
6:15 PM	9	134	40	4	0	187	41	118	14	0	0	173	46	75	18	8	0	147	32	109	3	8	0	152	659
6:30 PM	14	100	22	9	0	145	24	95	12	0	0	131	53	76	9	12	0	150	32	90	3	4	0	129	555
6:45 PM	6	92	30	7	0	135	36	75	13	0	0	124	35	76	16	10	0	137	29	95	3	3	0	130	526
Hourly Total	42	468	117	36	0	663	135	434	68	0	0	637	174	337	73	38	0	622	119	388	14	24	0	545	2467
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	13	63	24	11	0	111	37	76	16	0	0	129	39	126	17	6	0	188	22	92	8	6	0	128	556
10:15 AM	14	90	24	10	0	138	21	73	17	0	0	111	37	104	17	5	0	163	30	103	6	5	0	144	556
10:30 AM	9	92	27	7	0	135	24	84	22	0	0	130	38	96	17	6	0	157	31	86	4	6	0	127	549
10:45 AM	20	80	36	7	1	143	35	84	27	0	0	146	43	91	26	8	0	168	32	100	8	3	0	143	600
Hourly Total	56	325	111	35	1	527	117	317	82	0	0	516	157	417	77	25	0	676	115	381	26	20	0	542	2261
11:00 AM	16	92	29	7	1	144	30	103	26	0	0	159	41	108	13	2	0	164	23	102	8	5	0	138	605
11:15 AM	14	78	27	5	0	124	27	116	25	0	0	168	40	82	17	4	0	143	33	96	5	4	0	138	573
11:30 AM	15	86	36	9	0	146	28	100	22	0	0	150	41	90	21	14	0	166	49	107	6	7	0	169	631
11:45 AM	15	108	33	5	0	161	29	126	22	0	0	177	53	101	17	11	0	182	41	105	8	2	0	156	676
Hourly Total	60	364	125	26	1	575	114	445	95	0	0	654	175	381	68	31	0	655	146	410	27	18	0	601	2485
12:00 PM	18	77	23	10	0	128	45	101	25	0	0	171	41	89	22	5	0	157	32	99	6	6	0	143	599
12:15 PM	16	108	23	8	0	155	22	101	27	1	0	151	38	103	25	4	0	170	43	110	9	7	0	169	645
12:30 PM	12	78	40	7	0	137	29	102	20	0	0	151	35	107	25	1	0	168	43	111	10	11	0	175	631
12:45 PM	12	120	47	12	0	191	30	117	28	0	0	175	50	103	26	4	0	183	31	105	7	9	0	152	701
Hourly Total	58	383	133	37	0	611	126	421	100	1	0	648	164	402	98	14	0	678	149	425	32	33	0	639	2576
1:00 PM	17	95	27	11	0	150	37	91	16	3	0	147	42	122	21	4	0	189	39	106	6	5	0	156	642
1:15 PM	21	95	32	6	0	154	22	90	18	0	0	130	32	85	15	7	0	139	37	101	4	5	0	147	570

1:30 PM	16	83	27	5	0	131	25	119	19	0	0	163	33	62	21	5	0	121	32	90	9	5	0	136	551
1:45 PM	12	93	20	8	0	133	22	87	22	1	0	132	38	83	13	4	0	138	35	111	0	5	0	151	554
Hourly Total	66	366	106	30	0	568	106	387	75	4	0	572	145	352	70	20	0	587	143	408	19	20	0	590	2317
Grand Total	616	6754	1655	506	6	9531	1673	6329	868	8	2	8878	2068	4139	1091	382	0	7680	1421	4454	292	269	1	6436	32525
Approach %	6.5	70.9	17.4	5.3	-	-	18.8	71.3	9.8	0.1	-	-	26.9	53.9	14.2	5.0	-	-	22.1	69.2	4.5	4.2	-	-	-
Total %	1.9	20.8	5.1	1.6	-	29.3	5.1	19.5	2.7	0.0	-	27.3	6.4	12.7	3.4	1.2	-	23.6	4.4	13.7	0.9	0.8	-	19.8	-
Lights	601	6660	1621	497	-	9379	1643	6221	856	8	-	8728	2025	4089	1075	377	-	7566	1409	4405	287	263	-	6364	32037
% Lights	97.6	98.6	97.9	98.2	-	98.4	98.2	98.3	98.6	100.0	-	98.3	97.9	98.8	98.5	98.7	-	98.5	99.2	98.9	98.3	97.8	-	98.9	98.5
Other Vehicles	15	94	34	9	-	152	30	108	12	0	-	150	43	50	16	5	-	114	12	49	5	6	-	72	488
% Other Vehicles	2.4	1.4	2.1	1.8	-	1.6	1.8	1.7	1.4	0.0	-	1.7	2.1	1.2	1.5	1.3	-	1.5	0.8	1.1	1.7	2.2	-	1.1	1.5
Pedestrians	-	-	-	-	6	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 3



Turning Movement Data Plot

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 4

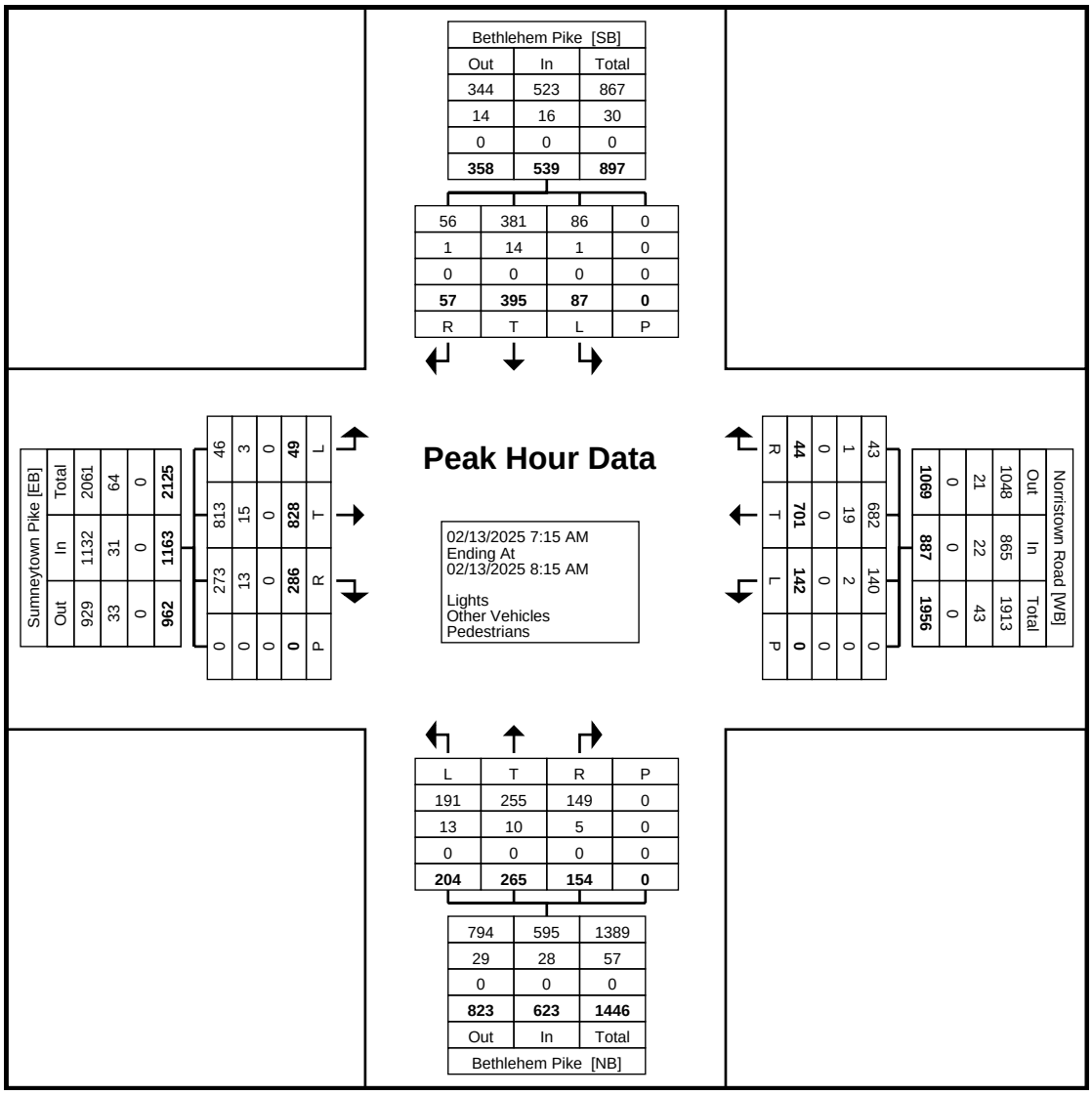
Turning Movement Peak Hour Data (7:15 AM)

Start Time	Sumneytown Pike Eastbound						Norristown Road Westbound						Bethlehem Pike Northbound						Bethlehem Pike Southbound						
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
7:15 AM	8	212	81	29	0	330	32	158	11	0	0	201	46	39	23	13	0	121	13	111	7	2	0	133	785
7:30 AM	10	190	44	12	0	256	32	191	5	0	0	228	52	61	30	15	0	158	19	82	5	9	0	115	757
7:45 AM	13	214	43	16	0	286	41	153	18	0	0	212	58	74	28	6	0	166	25	98	10	9	0	142	806
8:00 AM	18	212	42	19	0	291	37	199	10	0	0	246	48	91	25	14	0	178	30	104	9	6	0	149	864
Total	49	828	210	76	0	1163	142	701	44	0	0	887	204	265	106	48	0	623	87	395	31	26	0	539	3212
Approach %	4.2	71.2	18.1	6.5	-	-	16.0	79.0	5.0	0.0	-	-	32.7	42.5	17.0	7.7	-	-	16.1	73.3	5.8	4.8	-	-	-
Total %	1.5	25.8	6.5	2.4	-	36.2	4.4	21.8	1.4	0.0	-	27.6	6.4	8.3	3.3	1.5	-	19.4	2.7	12.3	1.0	0.8	-	16.8	-
PHF	0.681	0.967	0.648	0.655	-	0.881	0.866	0.881	0.611	0.000	-	0.901	0.879	0.728	0.883	0.800	-	0.875	0.725	0.890	0.775	0.722	-	0.904	0.929
Lights	46	813	199	74	-	1132	140	682	43	0	-	865	191	255	101	48	-	595	86	381	30	26	-	523	3115
% Lights	93.9	98.2	94.8	97.4	-	97.3	98.6	97.3	97.7	-	-	97.5	93.6	96.2	95.3	100.0	-	95.5	98.9	96.5	96.8	100.0	-	97.0	97.0
Other Vehicles	3	15	11	2	-	31	2	19	1	0	-	22	13	10	5	0	-	28	1	14	1	0	-	16	97
% Other Vehicles	6.1	1.8	5.2	2.6	-	2.7	1.4	2.7	2.3	-	-	2.5	6.4	3.8	4.7	0.0	-	4.5	1.1	3.5	3.2	0.0	-	3.0	3.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 6

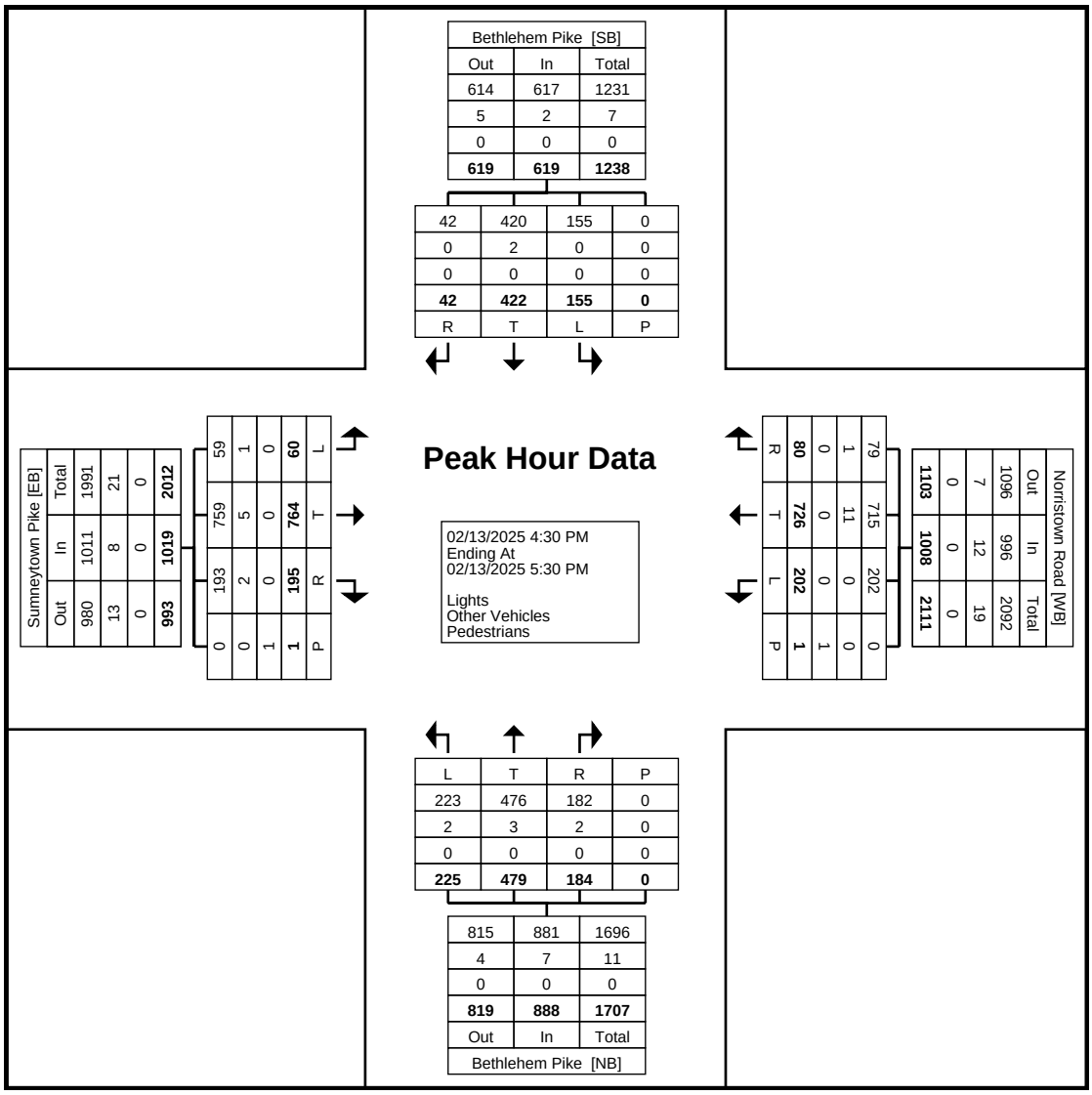
Turning Movement Peak Hour Data (4:30 PM)

	Sumneytown Pike Eastbound						Norristown Road Westbound						Bethlehem Pike Northbound						Bethlehem Pike Southbound						
Start Time	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
4:30 PM	11	193	31	13	0	248	44	206	21	0	0	271	56	107	48	4	0	215	41	102	4	5	0	152	886
4:45 PM	18	208	39	6	0	271	45	159	18	0	0	222	54	112	24	11	0	201	34	106	5	8	0	153	847
5:00 PM	12	171	41	17	1	241	58	206	22	0	0	286	60	140	37	5	0	242	47	104	7	5	0	163	932
5:15 PM	19	192	35	13	0	259	55	155	19	0	1	229	55	120	40	15	0	230	33	110	6	2	0	151	869
Total	60	764	146	49	1	1019	202	726	80	0	1	1008	225	479	149	35	0	888	155	422	22	20	0	619	3534
Approach %	5.9	75.0	14.3	4.8	-	-	20.0	72.0	7.9	0.0	-	-	25.3	53.9	16.8	3.9	-	-	25.0	68.2	3.6	3.2	-	-	-
Total %	1.7	21.6	4.1	1.4	-	28.8	5.7	20.5	2.3	0.0	-	28.5	6.4	13.6	4.2	1.0	-	25.1	4.4	11.9	0.6	0.6	-	17.5	-
PHF	0.789	0.918	0.890	0.721	-	0.940	0.871	0.881	0.909	0.000	-	0.881	0.938	0.855	0.776	0.583	-	0.917	0.824	0.959	0.786	0.625	-	0.949	0.948
Lights	59	759	144	49	-	1011	202	715	79	0	-	996	223	476	148	34	-	881	155	420	22	20	-	617	3505
% Lights	98.3	99.3	98.6	100.0	-	99.2	100.0	98.5	98.8	-	-	98.8	99.1	99.4	99.3	97.1	-	99.2	100.0	99.5	100.0	100.0	-	99.7	99.2
Other Vehicles	1	5	2	0	-	8	0	11	1	0	-	12	2	3	1	1	-	7	0	2	0	0	-	2	29
% Other Vehicles	1.7	0.7	1.4	0.0	-	0.8	0.0	1.5	1.3	-	-	1.2	0.9	0.6	0.7	2.9	-	0.8	0.0	0.5	0.0	0.0	-	0.3	0.8
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 7



Turning Movement Peak Hour Data Plot (4:30 PM)

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 8

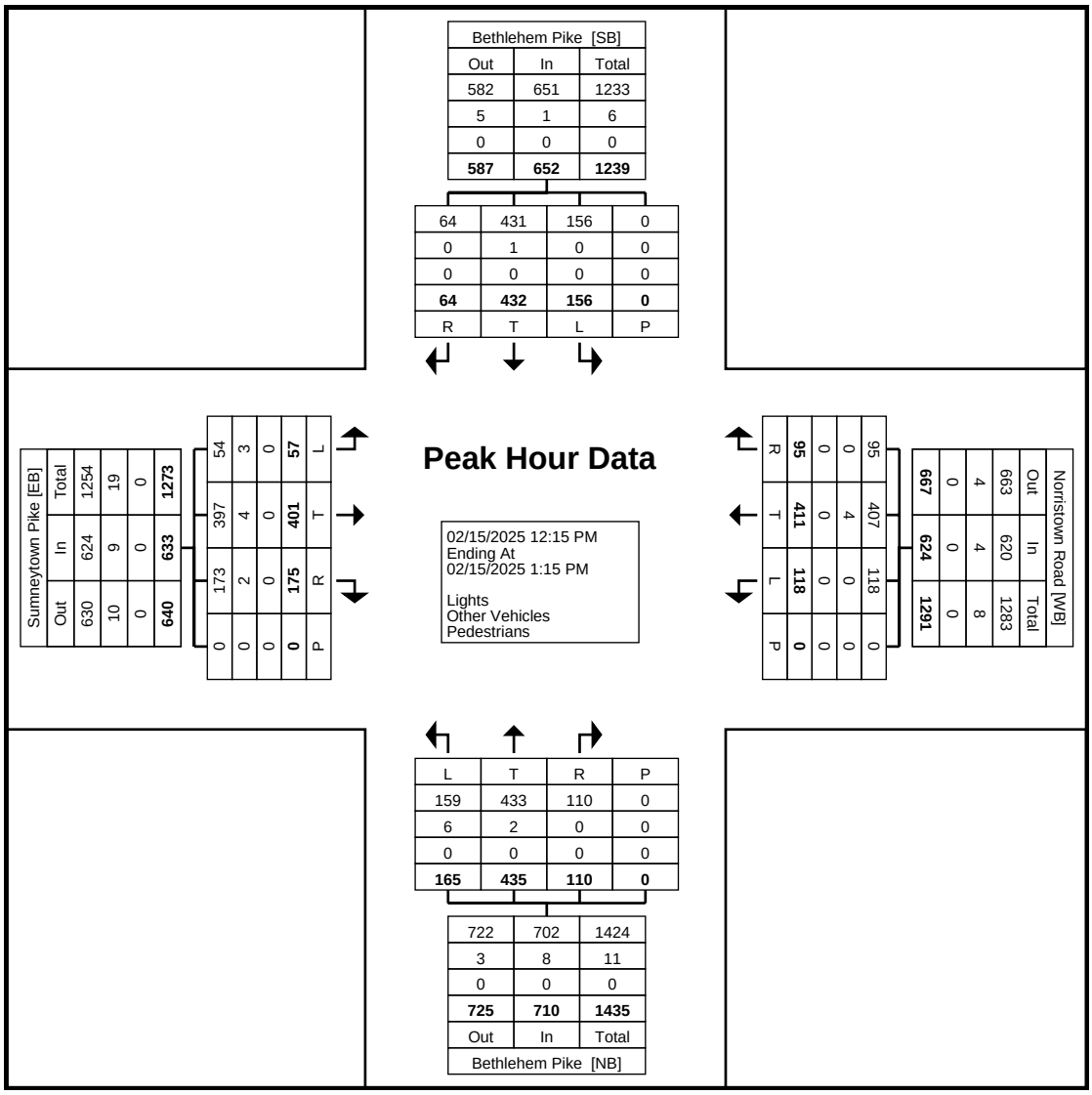
Turning Movement Peak Hour Data (12:15 PM)

	Sumneytown Pike Eastbound						Norristown Road Westbound						Bethlehem Pike Northbound						Bethlehem Pike Southbound						
Start Time	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Int. Total
12:15 PM	16	108	23	8	0	155	22	101	27	1	0	151	38	103	25	4	0	170	43	110	9	7	0	169	645
12:30 PM	12	78	40	7	0	137	29	102	20	0	0	151	35	107	25	1	0	168	43	111	10	11	0	175	631
12:45 PM	12	120	47	12	0	191	30	117	28	0	0	175	50	103	26	4	0	183	31	105	7	9	0	152	701
1:00 PM	17	95	27	11	0	150	37	91	16	3	0	147	42	122	21	4	0	189	39	106	6	5	0	156	642
Total	57	401	137	38	0	633	118	411	91	4	0	624	165	435	97	13	0	710	156	432	32	32	0	652	2619
Approach %	9.0	63.3	21.6	6.0	-	-	18.9	65.9	14.6	0.6	-	-	23.2	61.3	13.7	1.8	-	-	23.9	66.3	4.9	4.9	-	-	-
Total %	2.2	15.3	5.2	1.5	-	24.2	4.5	15.7	3.5	0.2	-	23.8	6.3	16.6	3.7	0.5	-	27.1	6.0	16.5	1.2	1.2	-	24.9	-
PHF	0.838	0.835	0.729	0.792	-	0.829	0.797	0.878	0.813	0.333	-	0.891	0.825	0.891	0.933	0.813	-	0.939	0.907	0.973	0.800	0.727	-	0.931	0.934
Lights	54	397	137	36	-	624	118	407	91	4	-	620	159	433	97	13	-	702	156	431	32	32	-	651	2597
% Lights	94.7	99.0	100.0	94.7	-	98.6	100.0	99.0	100.0	100.0	-	99.4	96.4	99.5	100.0	100.0	-	98.9	100.0	99.8	100.0	100.0	-	99.8	99.2
Other Vehicles	3	4	0	2	-	9	0	4	0	0	-	4	6	2	0	0	-	8	0	1	0	0	-	1	22
% Other Vehicles	5.3	1.0	0.0	5.3	-	1.4	0.0	1.0	0.0	0.0	-	0.6	3.6	0.5	0.0	0.0	-	1.1	0.0	0.2	0.0	0.0	-	0.2	0.8
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Counter: MIO:
Set up By JH::

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Count Name: 008 Bethlehem Pike & Norristown Road-Sumneytown Pike
Site Code:
Start Date: 02/13/2025
Page No: 9

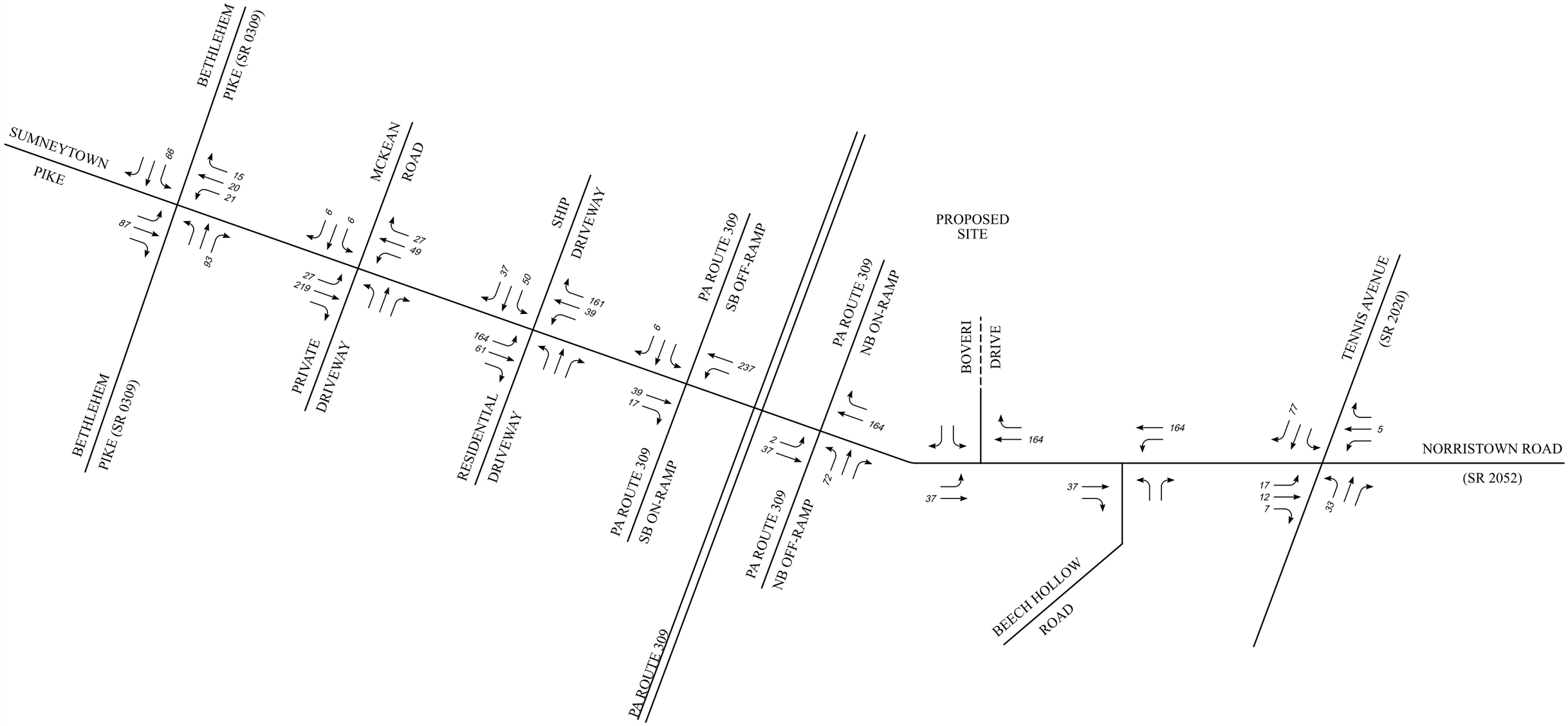


Turning Movement Peak Hour Data Plot (12:15 PM)

APPENDIX D:

Near-by Trip Distributions

Spring House Mixed Use Development (SHIP)



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

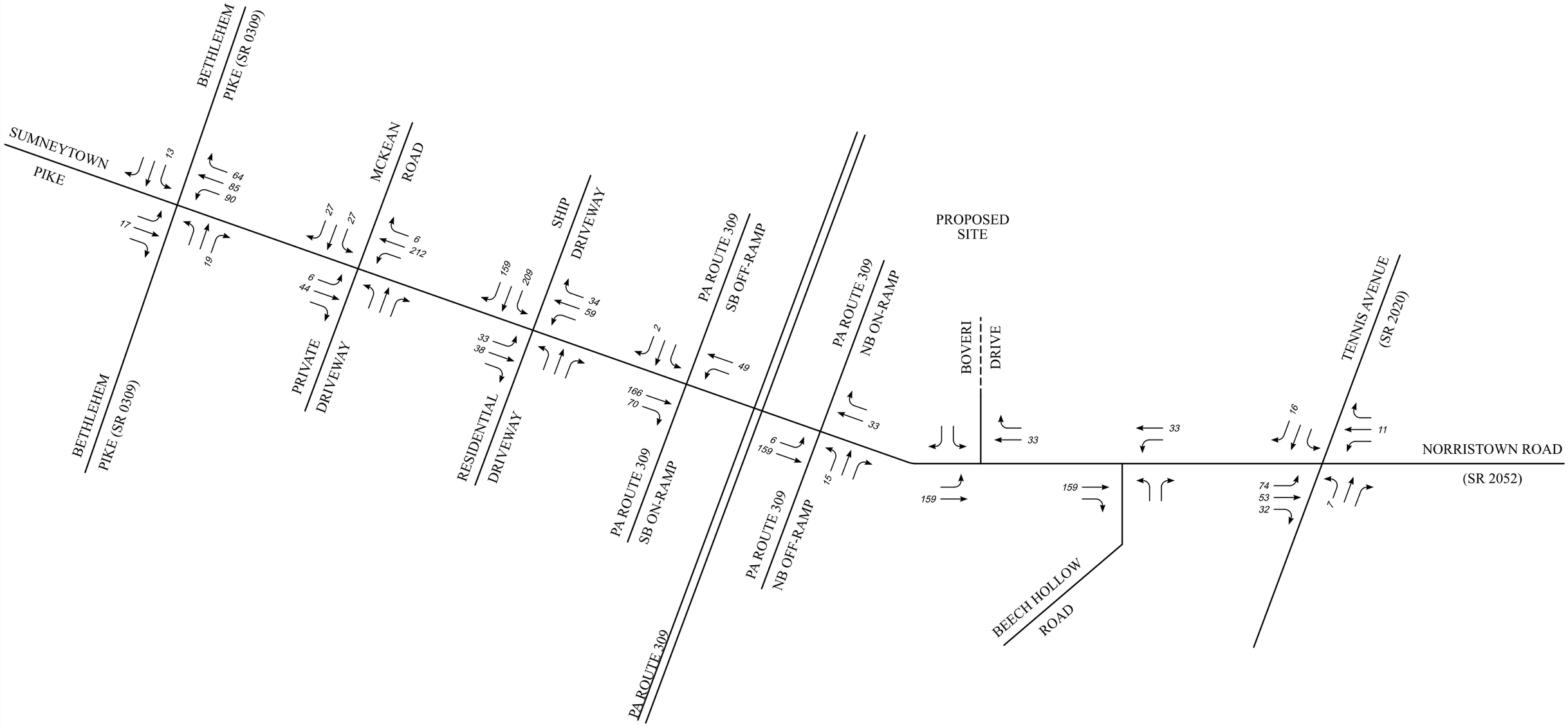
www.TPDinc.com

1.877.873.9739

info@TPDinc.com

FIGURE D-1

SPRING HOUSE MIXED USE DEVELOPMENT (SHIP)
WEEKDAY A.M. PEAK HOUR
NEARBY TRIP DISTRIBUTION



KEY:

– – – – – PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

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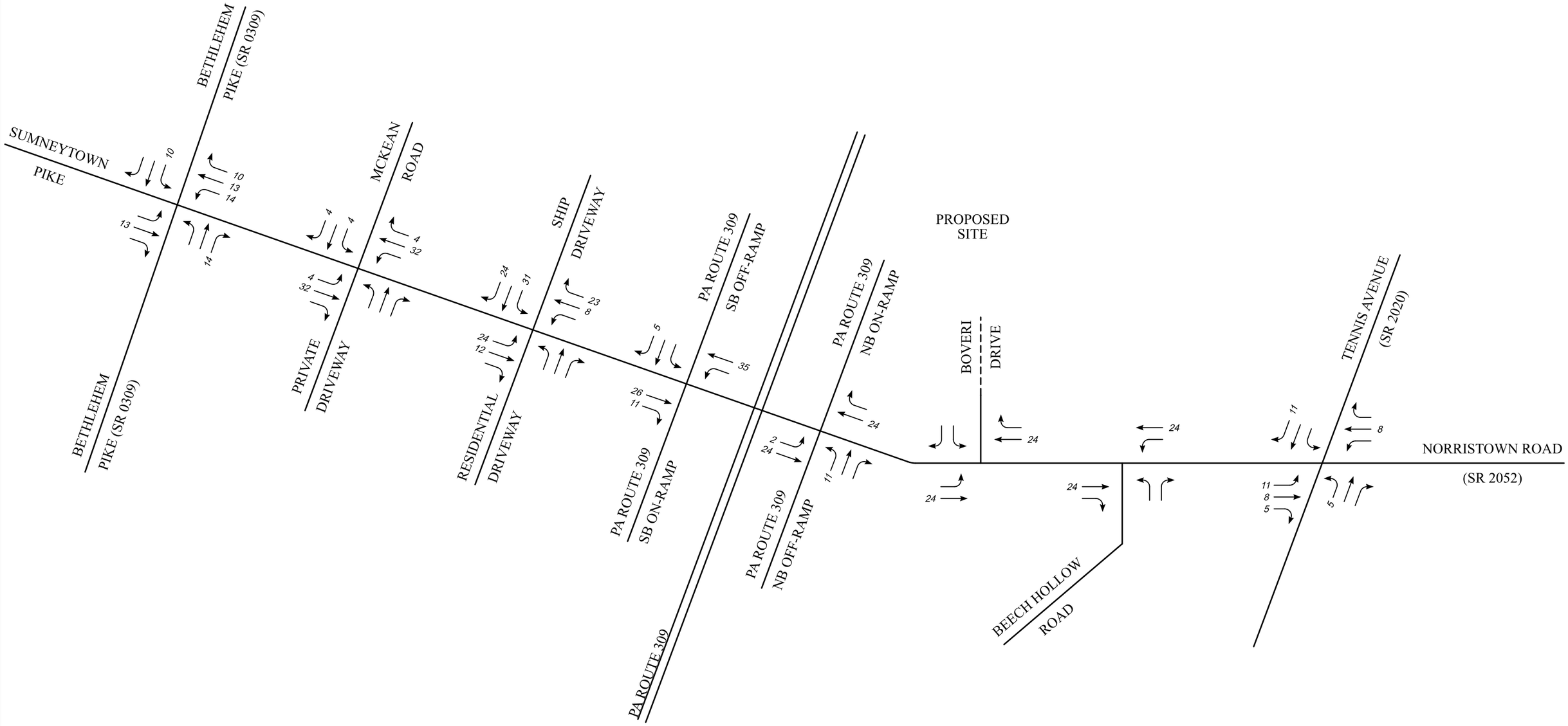
FIGURE D-2

SPRING HOUSE MIXED USE DEVELOPMENT (SHIP)
WEEKDAY P.M. PEAK HOUR
NEARBY TRIP DISTRIBUTION



KEY:

– – – – – PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

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FIGURE D-3

SPRING HOUSE MIXED USE DEVELOPMENT (SHIP)
MIDDAY SATURDAY PEAK HOUR
NEARBY TRIP DISTRIBUTION

APPENDIX E:

Trip Generation/Internal Capture Data

Trip Generation Data

ITE #221 - Multifamily Housing (Mid-Rise)

Not Close to Rail Transit

278 dwelling units

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
7

Avg. Num. of Dwelling Units:
192

Average Rate:
4.46

Range of Rates:
3.76 - 5.40

Standard Deviation:
0.62

Fitted Curve Equation:
T = 4.55(X) - 17.52

R^2:
0.90

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 1240 (Total), 620 (Entry), 620 (Exit)
Fitted Curve: 1247 (Total), 624 (Entry), 623 (Exit)

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
20

Avg. Num. of Dwelling Units:
184

Average Rate:
0.38

Range of Rates:
0.15 - 0.67

Standard Deviation:
0.10

Fitted Curve Equation:
T = 0.42(X) - 7.77

R^2:
0.87

Directional Distribution:
23% entering, 77% exiting

Calculated Trip Ends:
Average Rate: 106 (Total), 24 (Entry), 82 (Exit)
Fitted Curve: 109 (Total), 25 (Entry), 84 (Exit)

ATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
21

Avg. Num. of Dwelling Units:
179

Average Rate:
0.38

Range of Rates:
0.26 - 0.57

Standard Deviation:
0.07

Fitted Curve Equation:
$T = 0.36(X) + 3.07$

R^2:
0.92

Directional Distribution:
64% entering, 36% exiting

Calculated Trip Ends:
Average Rate: 106 (Total), 68 (Entry), 38 (Exit)
Fitted Curve: 103 (Total), 66 (Entry), 37 (Exit)

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
2

Avg. Num. of Dwelling Units:
266

Average Rate:
0.36

Range of Rates:
0.34 - 0.37

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
51% entering, 49% exiting

Calculated Trip Ends:
Average Rate: 100 (Total), 51 (Entry), 49 (Exit)

ITE #710 – General Office Building
77.619k (Proposed)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
22

Avg. 1000 Sq. Ft. GFA:
126

Average Rate:
7.83

Range of Rates:
3.27 - 27.56

Standard Deviation:
3.71

Fitted Curve Equation:
$T = 6.18(X) + 207.96$

R^2:
0.86

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 608 (Total), 304 (Entry), 304 (Exit)
Fitted Curve: 688 (Total), 344 (Entry), 344 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
54

Avg. 1000 Sq. Ft. GFA:
170

Average Rate:
1.24

Range of Rates:
0.32 - 2.83

Standard Deviation:
0.40

Fitted Curve Equation:
$T = 1.12(X) + 19.95$

R^2:
0.89

Directional Distribution:
88% entering, 12% exiting

Calculated Trip Ends:
Average Rate: 96 (Total), 85 (Entry), 11 (Exit)
Fitted Curve: 107 (Total), 94 (Entry), 13 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
53

Avg. 1000 Sq. Ft. GFA:
166

Average Rate:
1.18

Range of Rates:
0.26 - 2.59

Standard Deviation:
0.41

Fitted Curve Equation:
$T = 0.99(X) + 31.14$

R^2:
0.89

Directional Distribution:
16% entering, 84% exiting

Calculated Trip Ends:
Average Rate: 92 (Total), 15 (Entry), 77 (Exit)
Fitted Curve: 108 (Total), 17 (Entry), 91 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
1

Avg. 1000 Sq. Ft. GFA:
35

Average Rate:
0.88

Range of Rates:
0.88 - 0.88

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
54% entering, 46% exiting

Calculated Trip Ends:
Average Rate: 68 (Total), 37 (Entry), 31 (Exit)

ITE #821 – Shopping Plaza (40-150k) With Supermarket

DATA STATISTICS

Land Use:
Shopping Plaza (40-150k) - Supermarket - Yes (821) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GLA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
4

Avg. 1000 Sq. Ft. GLA:
77

Average Rate:
101.43

Range of Rates:
76.93 - 113.46

Standard Deviation:
17.91

Fitted Curve Equation:
T = 136.41(X) - 2680.46

R^2:
0.95

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 4742 (Total), 2371 (Entry), 2371 (Exit)
Fitted Curve: 3697 (Total), 1848 (Entry), 1849 (Exit)

DATA STATISTICS

Land Use:
Shopping Plaza (40-150k) - Supermarket - Yes (821) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GLA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
6

Avg. 1000 Sq. Ft. GLA:
77

Average Rate:
3.54

Range of Rates:
2.37 - 4.99

Standard Deviation:
1.10

Fitted Curve Equation:
T = 3.89(X) - 27.40

R^2:
0.51

Directional Distribution:
60% entering, 40% exiting

Calculated Trip Ends:
Average Rate: 165 (Total), 99 (Entry), 66 (Exit)
Fitted Curve: 154 (Total), 93 (Entry), 61 (Exit)

DATA STATISTICS

Land Use:
Shopping Plaza (40-150k) - Supermarket - Yes (821) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GLA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
17

Avg. 1000 Sq. Ft. GLA:
88

Average Rate:
8.58

Range of Rates:
4.43 - 14.67

Standard Deviation:
2.43

Fitted Curve Equation:
T = 9.34(X) - 66.48

R^2:
0.67

Directional Distribution:
49% entering, 51% exiting

Calculated Trip Ends:
Average Rate: 401 (Total), 197 (Entry), 204 (Exit)
Fitted Curve: 370 (Total), 181 (Entry), 189 (Exit)

Vehicle Pass-By Rates by Land Use

Source: ITE *Trip Generation Manual* , 12th Edition

Land Use Code	821
Land Use	Shopping Plaza (40 - 150k)
Setting	General Urban/Suburban
Time Period	Weekday PM Peak Period
# Data Sites	15
Average Pass-By Rate	40%

Pass-By Characteristics for Individual Sites

GLA (000)	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
45	Florida	1992	844	56	24	20	44	—	30
50	Florida	1992	555	41	41	18	59	—	30
52	Florida	1995	665	42	33	25	58	—	30
53	Florida	1993	162	59	—	—	41	—	30
57.23	Kentucky	1993	247	31	53	16	69	2659	34
60	Florida	1995	1583	40	38	22	60	—	30
69.4	Kentucky	1993	109	25	42	33	75	1559	34
77	Florida	1992	365	46	—	—	54	—	30
78	Florida	1991	702	55	23	22	45	—	30
82	Florida	1992	336	34	—	—	66	—	30
92.857	Kentucky	1993	133	22	50	28	78	3555	34
100.888	Kentucky	1993	281	28	50	22	72	2111	34
121.54	Kentucky	1993	210	53	30	17	47	2636	34
144	New Jersey	1990	176	32	44	24	68	—	24
146.8	Kentucky	1993	—	36	39	25	64	—	34

DATA STATISTICS

Land Use:
Shopping Plaza (40-150k) - Supermarket - Yes (821) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GLA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
5

Avg. 1000 Sq. Ft. GLA:
76

Average Rate:
7.67

Range of Rates:
5.51 - 9.54

Standard Deviation:
1.64

Fitted Curve Equation:
T = 5.46(X) + 168.21

R^2:
0.79

Directional Distribution:
49% entering, 51% exiting

Calculated Trip Ends:
Average Rate: 359 (Total), 176 (Entry), 183 (Exit)
Fitted Curve: 423 (Total), 207 (Entry), 216 (Exit)

Vehicle Pass-By Rates by Land Use

Source: ITE *Trip Generation Manual* , 12th Edition

Land Use Code	821								
Land Use	Shopping Plaza (40 - 150k)								
Setting	General Urban/Suburban								
Time Period	Saturday Midday								
# Data Sites	1								
Average Pass-By Rate	31%								
	Pass-By Characteristics for Individual Sites								
	State or	Survey		Pass-By	Non-Pass-By Trips			Adjacent Street	
GLA (000)	Province	Year	# Interviews	Trip (%)	Primary (%)	Diverted (%)	Total (%)	Daily Volume	Source
144	New Jersey	1990	264	31	47	22	69	63362	24

ITE #710 – General Office Building
143.295k (Existing at Full-Capacity)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
22

Avg. 1000 Sq. Ft. GFA:
126

Average Rate:
7.83

Range of Rates:
3.27 - 27.56

Standard Deviation:
3.71

Fitted Curve Equation:
$T = 6.18(X) + 207.96$

R^2:
0.86

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 1122 (Total), 561 (Entry), 561 (Exit)
Fitted Curve: 1094 (Total), 547 (Entry), 547 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
54

Avg. 1000 Sq. Ft. GFA:
170

Average Rate:
1.24

Range of Rates:
0.32 - 2.83

Standard Deviation:
0.40

Fitted Curve Equation:
T = 1.12(X) + 19.95

R^2:
0.89

Directional Distribution:
88% entering, 12% exiting

Calculated Trip Ends:
Average Rate: 178 (Total), 156 (Entry), 22 (Exit)
Fitted Curve: 180 (Total), 159 (Entry), 21 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
53

Avg. 1000 Sq. Ft. GFA:
166

Average Rate:
1.18

Range of Rates:
0.26 - 2.59

Standard Deviation:
0.41

Fitted Curve Equation:
$T = 0.99(X) + 31.14$

R^2:
0.89

Directional Distribution:
16% entering, 84% exiting

Calculated Trip Ends:
Average Rate: 169 (Total), 27 (Entry), 142 (Exit)
Fitted Curve: 173 (Total), 28 (Entry), 145 (Exit)

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
1

Avg. 1000 Sq. Ft. GFA:
35

Average Rate:
0.88

Range of Rates:
0.88 - 0.88

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
54% entering, 46% exiting

Calculated Trip Ends:
Average Rate: 126 (Total), 68 (Entry), 58 (Exit)

Trip Generation Table

TABLE E-1
TRIP GENERATION SUMMARY

Land Use	Size	Total Trips			Interaction			Pass-By Trips			New Trips		
		Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Average Weekday													
ITE #221 (Mid-Rise/Not Close to Transit)	278 du	1247	624	623	-320	-160	-160	0	0	0	927	464	463
ITE #710	77.619 ksf	688	344	344	-110	-55	-55	0	0	0	578	289	289
ITE #821 (40-150k - With Supermarket)	46.75 ksf	4742	2371	2371	-646	-323	-323	0	0	0	4096	2048	2048
TOTAL		***6677***	***3339***	***3338***	***-1076***	***-538***	***-538***	***0***	***0***	***0***	***5601***	***2801***	***2800***
Weekday AM													
ITE #221 (Mid-Rise/Not Close to Transit)	278 du	109	25	84	-4	-1	-3	0	0	0	105	24	81
ITE #710	77.619 ksf	107	94	13	-10	-6	-4	0	0	0	97	88	9
ITE #821 (40-150k - With Supermarket)	46.75 ksf	165	99	66	-10	-5	-5	46	28	18	109	66	43
TOTAL		***381***	***218***	***163***	***-24***	***-12***	***-12***	***46***	***28***	***18***	***311***	***178***	***133***
Weekday PM													
ITE #221 (Mid-Rise/Not Close to Transit)	278 du	106	68	38	-51	-33	-18	0	0	0	55	35	20
ITE #710	77.619 ksf	108	17	91	-24	-6	-18	0	0	0	84	11	73
ITE #821 (40-150k - With Supermarket)	46.75 ksf	401	197	204	-67	-32	-35	134	66	68	200	99	101
TOTAL		***615***	***282***	***333***	***-142***	***-71***	***-71***	***134***	***66***	***68***	***339***	***145***	***194***
SAT Midday													
ITE #221 (Mid-Rise/Not Close to Transit)	278 du	100	51	49	-27	-19	-8	0	0	0	73	32	41
ITE #710	77.619 ksf	68	37	31	-11	-4	-7	0	0	0	57	33	24
ITE #821 (40-150k - With Supermarket)	46.75 ksf	423	207	216	-58	-26	-32	113	56	57	252	125	127
TOTAL		***591***	***295***	***296***	***-96***	***-49***	***-47***	***113***	***56***	***57***	***382***	***190***	***192***

Internal Capture

AM & PM

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	BETI.00012	**Organization:**	TPD
Project Location:	Lower Gwynedd	**Performed By:**	mb
Scenario Description:	Proposed Scenario	**Date:**	1/23/2026
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	#710	77.619	ksf	107	94	13
Retail	#821	46.75	ksf	165	99	66
Restaurant				0		
Cinema/Entertainment				0		
Residential	#221	278	du	109	25	84
Hotel				0		
All Other Land Uses[2]				0		
				381	218	163

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4	0	0	0	0
Retail	4		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	381	218	163
Internal Capture Percentage	6%	6%	7%
External Vehicle-Trips[5]	357	206	151
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	6%	31%
Retail	5%	8%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	4%	4%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	BETI.00012
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	94	94	1.00	13	13
Retail	1.00	99	99	1.00	66	66
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	25	25	1.00	84	84
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4	8	0	0	0
Retail	19		9	0	9	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	17	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		32	0	0	0	0
Retail	4		0	0	1	0
Restaurant	13	8		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	17	0	0		0
Hotel	3	4	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	6	88	94	88	0	0
Retail	5	94	99	94	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	24	25	24	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	4	9	13	9	0	0
Retail	5	61	66	61	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	81	84	81	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	BETI.00012	**Organization:**	TPD
Project Location:	Lower Gwynedd	**Performed By:**	mb
Scenario Description:	Proposed Scenario	**Date:**	1/23/2026
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	#710	77.619	ksf	108	17	91
Retail	#821	46.75	ksf	401	197	204
Restaurant				0		
Cinema/Entertainment				0		
Residential	#221	278	du	106	68	38
Hotel				0		
All Other Land Uses[2]				0		
				615	282	333

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		16	0	0	2	0
Retail	4		0	0	31	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	16	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	615	282	333
Internal Capture Percentage	23%	25%	21%
External Vehicle-Trips[5]	473	211	262
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	35%	20%
Retail	16%	17%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	49%	47%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	BETI.00012
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	17	17	1.00	91	91
Retail	1.00	197	197	1.00	204	204
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	68	68	1.00	38	38
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		18	4	0	2	0
Retail	4		59	8	53	10
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	16	8	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		16	0	0	3	0
Retail	5		0	0	31	0
Restaurant	5	99		0	11	0
Cinema/Entertainment	1	8	0		3	0
Residential	10	20	0	0		0
Hotel	0	4	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	6	11	17	11	0	0
Retail	32	165	197	165	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	33	35	68	35	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	18	73	91	73	0	0
Retail	35	169	204	169	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	18	20	38	20	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Average Weekday & SAT Midday

BETI.00012
Average Weekday and SAT Midday Interaction Narrative

Average Weekday:

TABLE E-2

	Total Trip Gen			Total Interaction			
	AM	PM	TOTAL	AM	PM	TOTAL	INT % By Use
ITE #221	109	106	**215**	-4	-51	**-55**	**-25.6%**
ITE #710	107	108	**215**	-10	-24	**-34**	**-15.8%**
ITE #821	165	401	**566**	-10	-67	**-77**	**-13.6%**

Weighted % = -16.1%

*****Interaction % for Each Land Use = (AM Total Interaction + PM Total Interaction) / (AM Total TGen + PM Total TGen)**
*****Interaction for % Each Land Use Applied to Average Weekday Trip Gen for Average Weekday Interaction**

SAT Midday Peak Hour:

ENTER

TABLE E-3

	Total Trip Gen			Total Interaction			
	AM	PM	TOTAL	AM	PM	TOTAL	INT % By Use
ITE #221	25	68	**93**	-1	-33	**-34**	**-36.6%**
ITE #710	94	17	**111**	-6	-6	**-12**	**-10.8%**
ITE #821	99	197	**296**	-5	-32	**-37**	**-12.5%**

EXIT

TABLE E-4

	Total Trip Gen			Total Interaction			
	AM	PM	TOTAL	AM	PM	TOTAL	INT % By Use
ITE #221	84	38	**122**	-3	-18	**-21**	**-17.2%**
ITE #710	13	91	**104**	-4	-18	**-22**	**-21.2%**
ITE #821	66	204	**270**	-5	-35	**-40**	**-14.8%**

Weighted % = -16.2%

*****Interaction % for Each Land Use for Enter = (AM Enter Interaction + PM Enter Interaction) / (AM Total Enter TGen + PM Total Enter TGen)**
*****Interaction for % Each Land Use For Enter Applied to SAT Midday Enter TGen for SAT Enter Interaction**
*****Interaction % for Each Land Use for Exit = (AM Exit Interaction + PM Exit Interaction) / (AM Total Exit TGen + PM Total Exit TGen)**
*****Interaction for % Each Land Use For Exit Applied to SAT Midday Exit TGen for SAT Exit Interaction**

APPENDIX F:

Traffic Volume Development Spreadsheets & Trip Assignment

TPD# BETI.012
1/27/2026
Traffic Volumes Worksheet

Intersection:	**Norristown Road & Boveri Drive/Proposed Driveway**											
Synchro Node:	**1**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**		

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**8**	**712**			**642**	**8**				**1**		**2**	**1373**
Balancing													0
2024 Existing Volumes (Balanced)	**8**	**712**			**642**	**8**				**1**		**2**	**1373**
Base growth (0.17% compounded for 3 yrs)		4			3								7
Base growth (0.17% compounded for 8 yrs)		10			9								19
Spring House Mixed Use Development (SHIP)		37			164								201
2027 Base Volumes	**8**	**716**			**645**	**8**				**1**		**2**	**1372**
2032 Base Volumes - Without SHIP	**8**	**722**			**651**	**8**				**1**		**2**	**1384**
2032 Base Volumes - With SHIP	**8**	**759**			**815**	**8**				**1**		**2**	**1585**

	New (Passby)	
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter	74.0%					26.0%							
Trip Assignment % - New Exit										26.0%		74.0%	
Trip Assignment % - PBy Enter	53.0%	-53.0%			-47.0%	47.0%							
Trip Assignment % - Pby Exit										53.0%		47.0%	
New Trips	132					46				35		98	311
Passby Trips	15	-15			-13	13				15		13	28
Base Redistribution	-8					-8				-1		-2	-19
2027 Projected Volumes	**147**	**701**			**632**	**59**				**50**		**111**	**1700**
2032 Projected Volumes - Without SHIP	**147**	**707**			**638**	**59**				**50**		**111**	**1712**
2032 Projected Volumes - With SHIP	**147**	**744**			**802**	**59**				**50**		**111**	**1913**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**7**	**1058**			**582**	**0**				**2**		**8**	**1657**
Balancing													0
2024 Existing Volumes (Balanced)	**7**	**1058**			**582**	**0**				**2**		**8**	**1657**
Base growth (0.17% compounded for 3 yrs)		5			3								8
Base growth (0.17% compounded for 8 yrs)		14			8								22
Spring House Mixed Use Development (SHIP)		159			33								192
2027 Base Volumes	**7**	**1063**			**585**	**0**				**2**		**8**	**1665**
2032 Base Volumes - Without SHIP	**7**	**1072**			**590**	**0**				**2**		**8**	**1679**
2032 Base Volumes - With SHIP	**7**	**1231**			**623**	**0**				**2**		**8**	**1871**

	New (Passby)	
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter	74.0%					26.0%							
Trip Assignment % - New Exit										26.0%		74.0%	
Trip Assignment % - PBy Enter	65.0%	-65.0%			-35.0%	35.0%							
Trip Assignment % - Pby Exit										65.0%		35.0%	
New Trips	107					38				50		144	339
Passby Trips	44	-44			-24	24				44		24	68
Base Redistribution	-7									-2		-8	-17
2027 Projected Volumes	**151**	**1019**			**561**	**62**				**94**		**168**	**2055**
2032 Projected Volumes - Without SHIP	**151**	**1028**			**566**	**62**				**94**		**168**	**2069**
2032 Projected Volumes - With SHIP	**151**	**1187**			**599**	**62**				**94**		**168**	**2261**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**2**	**565**			**561**	**1**				**2**		**1**	**1132**
Balancing													0
2024 Existing Volumes (Balanced)	**2**	**565**			**561**	**1**				**2**		**1**	**1132**
Base growth (0.17% compounded for 3 yrs)		3			3								6
Base growth (0.17% compounded for 8 yrs)		8			8								16
Spring House Mixed Use Development (SHIP)		24			24								48
2027 Base Volumes	**2**	**568**			**564**	**1**				**2**		**1**	**1138**
2032 Base Volumes - Without SHIP	**2**	**573**			**569**	**1**				**2**		**1**	**1148**
2032 Base Volumes - With SHIP	**2**	**597**			**593**	**1**				**2**		**1**	**1196**

	New (Passby)	
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter	74.0%					26.0%							
Trip Assignment % - New Exit										26.0%		74.0%	
Trip Assignment % - PBy Enter	50.0%	-50.0%			-50.0%	50.0%							
Trip Assignment % - Pby Exit										50.0%		50.0%	
New Trips	141					49				50		142	382
Passby Trips	29	-29			-28	28				29		28	57
Base Redistribution	-2					-1				-2		-1	-6
2027 Projected Volumes	**170**	**539**			**536**	**77**				**79**		**170**	**1571**
2032 Projected Volumes - Without SHIP	**170**	**544**			**541**	**77**				**79**		**170**	**1581**
2032 Projected Volumes - With SHIP	**170**	**568**			**565**	**77**				**79**		**170**	**1629**

TPD# BETI.012
1/27/2026
Traffic Volumes Worksheet

Intersection:	**Norristown Road & Beech Hollow Road**										
Synchro Node:	**2**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**	

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts		**719**	**1**	**0**	**654**		**3**		**2**				**1379**
Balancing													0
2024 Existing Volumes (Balanced)		**719**	**1**	**0**	**654**		**3**		**2**				**1379**
Base growth (0.17% compounded for 3 yrs)		4			3								7
Base growth (0.17% compounded for 8 yrs)		10			9								19
Spring House Mixed Use Development (SHIP)		37			164								201
2027 Base Volumes		**723**	**1**	**0**	**657**		**3**		**2**				**1386**
2032 Base Volumes - Without SHIP		**729**	**1**	**0**	**663**		**3**		**2**				**1398**
2032 Base Volumes - With SHIP		**766**	**1**	**0**	**827**		**3**		**2**				**1599**

	New (Passby)	
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter					26.0%								
Trip Assignment % - New Exit		26.0%											
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		35			46								81
Passby Trips													0
Base Redistribution		-1			-8								-9
2027 Projected Volumes		**757**	**1**	**0**	**695**		**3**		**2**				**1458**
2032 Projected Volumes - Without SHIP		**763**	**1**	**0**	**701**		**3**		**2**				**1470**
2032 Projected Volumes - With SHIP		**800**	**1**	**0**	**865**		**3**		**2**				**1671**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts		**1094**	**2**	**1**	**580**		**3**		**1**				**1681**
Balancing													0
2024 Existing Volumes (Balanced)		**1094**	**2**	**1**	**580**		**3**		**1**				**1681**
Base growth (0.17% compounded for 3 yrs)		6			3								9
Base growth (0.17% compounded for 8 yrs)		15			8								23
Spring House Mixed Use Development (SHIP)		159			33								192
2027 Base Volumes		**1100**	**2**	**1**	**583**		**3**		**1**				**1690**
2032 Base Volumes - Without SHIP		**1109**	**2**	**1**	**588**		**3**		**1**				**1704**
2032 Base Volumes - With SHIP		**1268**	**2**	**1**	**621**		**3**		**1**				**1896**

	New (Passby)	
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter					26.0%								
Trip Assignment % - New Exit		26.0%											
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		50			38								88
Passby Trips													0
Base Redistribution		-2											-2
2027 Projected Volumes		**1148**	**2**	**1**	**621**		**3**		**1**				**1776**
2032 Projected Volumes - Without SHIP		**1157**	**2**	**1**	**626**		**3**		**1**				**1790**
2032 Projected Volumes - With SHIP		**1316**	**2**	**1**	**659**		**3**		**1**				**1982**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts		**575**	**2**	**1**	**563**		**1**		**2**				**1144**
Balancing													0
2024 Existing Volumes (Balanced)		**575**	**2**	**1**	**563**		**1**		**2**				**1144**
Base growth (0.17% compounded for 3 yrs)		3			3								6
Base growth (0.17% compounded for 8 yrs)		8			8								16
Spring House Mixed Use Development (SHIP)		24			24								48
2027 Base Volumes		**578**	**2**	**1**	**566**		**1**		**2**				**1150**
2032 Base Volumes - Without SHIP		**583**	**2**	**1**	**571**		**1**		**2**				**1160**
2032 Base Volumes - With SHIP		**607**	**2**	**1**	**595**		**1**		**2**				**1208**

	New (Passby)	
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter					26.0%								
Trip Assignment % - New Exit		26.0%											
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		50			49								99
Passby Trips													0
Base Redistribution		-2			-1								-3
2027 Projected Volumes		**626**	**2**	**1**	**614**		**1**		**2**				**1246**
2032 Projected Volumes - Without SHIP		**631**	**2**	**1**	**619**		**1**		**2**				**1256**
2032 Projected Volumes - With SHIP		**655**	**2**	**1**	**643**		**1**		**2**				**1304**

TPD# BETI.012
1/27/2026
Traffic Volumes Worksheet

Intersection:	**Norristown Road & NB Route 309 Ramps**										
Synchro Node:	**3**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**	

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**4**	**477**			**620**	**25**	**752**	**0**	**249**				**2127**
Balancing													0
2024 Existing Volumes (Balanced)	**4**	**477**			**620**	**25**	**752**	**0**	**249**				**2127**
Base growth (0.17% compounded for 3 yrs)	0	2			3	0	4	0	1				10
Base growth (0.17% compounded for 8 yrs)	0	7			8	0	10	0	3				28
Spring House Mixed Use Development (SHIP)	2	37			164		72						275
2027 Base Volumes	**4**	**479**			**623**	**25**	**756**	**0**	**250**				**2137**
2032 Base Volumes - Without SHIP	**4**	**484**			**628**	**25**	**762**	**0**	**252**				**2155**
2032 Base Volumes - With SHIP	**6**	**521**			**792**	**25**	**834**	**0**	**252**				**2430**

		New (Passby)
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter		58.0%							16.0%				
Trip Assignment % - New Exit					72.0%	2.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		104			95	3			28				230
Passby Trips													0
Base Redistribution		-5			-2				-3				-10
2027 Projected Volumes	**4**	**578**			**716**	**28**	**756**	**0**	**275**				**2357**
2032 Projected Volumes - Without SHIP	**4**	**583**			**721**	**28**	**762**	**0**	**277**				**2375**
2032 Projected Volumes - With SHIP	**6**	**620**			**885**	**28**	**834**	**0**	**277**				**2650**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**18**	**869**			**525**	**58**	**373**	**0**	**182**				**2025**
Balancing													0
2024 Existing Volumes (Balanced)	**18**	**869**			**525**	**58**	**373**	**0**	**182**				**2025**
Base growth (0.17% compounded for 3 yrs)	0	4			3	0	2	0	1				10
Base growth (0.17% compounded for 8 yrs)	0	12			7	1	5	0	2				27
Spring House Mixed Use Development (SHIP)	6	159			33		15						213
2027 Base Volumes	**18**	**873**			**528**	**58**	**375**	**0**	**183**				**2035**
2032 Base Volumes - Without SHIP	**18**	**881**			**532**	**59**	**378**	**0**	**184**				**2052**
2032 Base Volumes - With SHIP	**24**	**1040**			**565**	**59**	**393**	**0**	**184**				**2265**

		New (Passby)
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter		58.0%							16.0%				
Trip Assignment % - New Exit					72.0%	2.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		84			140	4			23				251
Passby Trips													0
Base Redistribution		-4			-8				-3				-15
2027 Projected Volumes	**18**	**953**			**660**	**62**	**375**	**0**	**203**				**2271**
2032 Projected Volumes - Without SHIP	**18**	**961**			**664**	**63**	**378**	**0**	**204**				**2288**
2032 Projected Volumes - With SHIP	**24**	**1120**			**697**	**63**	**393**	**0**	**204**				**2501**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**5**	**427**			**506**	**38**	**342**	**0**	**171**				**1489**
Balancing													0
2024 Existing Volumes (Balanced)	**5**	**427**			**506**	**38**	**342**	**0**	**171**				**1489**
Base growth (0.17% compounded for 3 yrs)	0	2			3	0	2	0	1				8
Base growth (0.17% compounded for 8 yrs)	0	6			7	1	5	0	2				21
Spring House Mixed Use Development (SHIP)	2	24			24		11						61
2027 Base Volumes	**5**	**429**			**509**	**38**	**344**	**0**	**172**				**1497**
2032 Base Volumes - Without SHIP	**5**	**433**			**513**	**39**	**347**	**0**	**173**				**1510**
2032 Base Volumes - With SHIP	**7**	**457**			**537**	**39**	**358**	**0**	**173**				**1571**

		New (Passby)
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter		58.0%							16.0%				
Trip Assignment % - New Exit					72.0%	2.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		111			138	4			30				283
Passby Trips													0
Base Redistribution		-1			-1				-1				-3
2027 Projected Volumes	**5**	**539**			**646**	**42**	**344**	**0**	**201**				**1777**
2032 Projected Volumes - Without SHIP	**5**	**543**			**650**	**43**	**347**	**0**	**202**				**1790**
2032 Projected Volumes - With SHIP	**7**	**567**			**674**	**43**	**358**	**0**	**202**				**1851**

TPD# BETI.012
1/27/2026
Traffic Volumes Worksheet

Intersection:	**Norristown Road & SB Route 309 Ramps**										
Synchro Node:	**4**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**	

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts		**450**	**527**	**168**	**1200**					**45**	**0**	**23**	**2413**
Balancing													0
2024 Existing Volumes (Balanced)		**450**	**527**	**168**	**1200**					**45**	**0**	**23**	**2413**
Base growth (0.17% compounded for 3 yrs)		2	3	1	6					0	0	0	12
Base growth (0.17% compounded for 8 yrs)		6	7	2	16					1	0	0	32
Spring House Mixed Use Development (SHIP)		39	17		237							6	299
2027 Base Volumes		**452**	**530**	**169**	**1206**					**45**	**0**	**23**	**2425**
2032 Base Volumes - Without SHIP		**456**	**534**	**170**	**1216**					**46**	**0**	**23**	**2445**
2032 Base Volumes - With SHIP		**495**	**551**	**170**	**1453**					**46**	**0**	**29**	**2744**

	New	(Passby)
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter		56.0%								2.0%			
Trip Assignment % - New Exit				16.0%	56.0%								
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		100		21	74					4			199
Passby Trips													0
Base Redistribution		-5		-1	-1								-7
2027 Projected Volumes		**547**	**530**	**189**	**1279**					**49**	**0**	**23**	**2617**
2032 Projected Volumes - Without SHIP		**551**	**534**	**190**	**1289**					**50**	**0**	**23**	**2637**
2032 Projected Volumes - With SHIP		**590**	**551**	**190**	**1526**					**50**	**0**	**29**	**2936**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts		**499**	**864**	**157**	**843**					**25**	**2**	**7**	**2397**
Balancing													0
2024 Existing Volumes (Balanced)		**499**	**864**	**157**	**843**					**25**	**2**	**7**	**2397**
Base growth (0.17% compounded for 3 yrs)		3	4	1	4					0	0	0	12
Base growth (0.17% compounded for 8 yrs)		7	12	2	12					0	0	0	33
Spring House Mixed Use Development (SHIP)		166	70		49							2	287
2027 Base Volumes		**502**	**868**	**158**	**847**					**25**	**2**	**7**	**2409**
2032 Base Volumes - Without SHIP		**506**	**876**	**159**	**855**					**25**	**2**	**7**	**2430**
2032 Base Volumes - With SHIP		**672**	**946**	**159**	**904**					**25**	**2**	**9**	**2717**

	New	(Passby)
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter		56.0%								2.0%			
Trip Assignment % - New Exit				16.0%	56.0%								
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		81		31	109					3			224
Passby Trips													0
Base Redistribution		-4		-3	-5								-12
2027 Projected Volumes		**579**	**868**	**186**	**951**					**28**	**2**	**7**	**2621**
2032 Projected Volumes - Without SHIP		**583**	**876**	**187**	**959**					**28**	**2**	**7**	**2642**
2032 Projected Volumes - With SHIP		**749**	**946**	**187**	**1008**					**28**	**2**	**9**	**2929**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts		**370**	**358**	**90**	**812**					**40**	**0**	**11**	**1681**
Balancing													0
2024 Existing Volumes (Balanced)		**370**	**358**	**90**	**812**					**40**	**0**	**11**	**1681**
Base growth (0.17% compounded for 3 yrs)		2	2	0	4					0	0	0	8
Base growth (0.17% compounded for 8 yrs)		5	5	1	11					1	0	0	23
Spring House Mixed Use Development (SHIP)		26	11		35							5	77
2027 Base Volumes		**372**	**360**	**90**	**816**					**40**	**0**	**11**	**1689**
2032 Base Volumes - Without SHIP		**375**	**363**	**91**	**823**					**41**	**0**	**11**	**1704**
2032 Base Volumes - With SHIP		**401**	**374**	**91**	**858**					**41**	**0**	**16**	**1781**

	New	(Passby)
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter		56.0%								2.0%			
Trip Assignment % - New Exit				16.0%	56.0%								
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		107		31	107					4			249
Passby Trips													0
Base Redistribution		-1			-1								-2
2027 Projected Volumes		**478**	**360**	**121**	**922**					**44**	**0**	**11**	**1936**
2032 Projected Volumes - Without SHIP		**481**	**363**	**122**	**929**					**45**	**0**	**11**	**1951**
2032 Projected Volumes - With SHIP		**507**	**374**	**122**	**964**					**45**	**0**	**16**	**2028**

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Traffic Volumes Worksheet

Intersection:	**Norristown Road & Tennis Avenue**										
Synchro Node:	**5**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**	

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**215**	**464**	**39**	**103**	**396**	**4**	**47**	**94**	**88**	**3**	**166**	**194**	**1813**
Balancing													0
2024 Existing Volumes (Balanced)	**215**	**464**	**39**	**103**	**396**	**4**	**47**	**94**	**88**	**3**	**166**	**194**	**1813**
Base growth (0.17% compounded for 3 yrs)	1	2	0	1	2	0	0	0	0	0	1	1	8
Base growth (0.17% compounded for 8 yrs)	3	6	1	1	5	0	1	1	1	0	2	3	24
Spring House Mixed Use Development (SHIP)	17	12	7		5		33					77	151
2027 Base Volumes	**216**	**466**	**39**	**104**	**398**	**4**	**47**	**94**	**88**	**3**	**167**	**195**	**1821**
2032 Base Volumes - Without SHIP	**218**	**470**	**40**	**104**	**401**	**4**	**48**	**95**	**89**	**3**	**168**	**197**	**1837**
2032 Base Volumes - With SHIP	**235**	**482**	**47**	**104**	**406**	**4**	**81**	**95**	**89**	**3**	**168**	**274**	**1988**

	New	(Passby)
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter					12.0%		7.0%					7.0%	
Trip Assignment % - New Exit	7.0%	12.0%	7.0%										
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips	9	17	9		22		12					12	81
Passby Trips													0
Base Redistribution		-1			-4		-2					-2	-9
2027 Projected Volumes	**225**	**482**	**48**	**104**	**416**	**4**	**57**	**94**	**88**	**3**	**167**	**205**	**1893**
2032 Projected Volumes - Without SHIP	**227**	**486**	**49**	**104**	**419**	**4**	**58**	**95**	**89**	**3**	**168**	**207**	**1909**
2032 Projected Volumes - With SHIP	**244**	**498**	**56**	**104**	**424**	**4**	**91**	**95**	**89**	**3**	**168**	**284**	**2060**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**209**	**500**	**385**	**74**	**373**	**13**	**59**	**152**	**85**	**8**	**122**	**140**	**2120**
Balancing													0
2024 Existing Volumes (Balanced)	**209**	**500**	**385**	**74**	**373**	**13**	**59**	**152**	**85**	**8**	**122**	**140**	**2120**
Base growth (0.17% compounded for 3 yrs)	1	3	2	0	2	0	0	1	0	0	1	1	11
Base growth (0.17% compounded for 8 yrs)	3	7	5	1	5	0	1	2	1	0	2	2	29
Spring House Mixed Use Development (SHIP)	74	53	32	0	11	0	7	0	0	0	0	16	193
2027 Base Volumes	**210**	**503**	**387**	**74**	**375**	**13**	**59**	**153**	**85**	**8**	**123**	**141**	**2131**
2032 Base Volumes - Without SHIP	**212**	**507**	**390**	**75**	**378**	**13**	**60**	**154**	**86**	**8**	**124**	**142**	**2149**
2032 Base Volumes - With SHIP	**286**	**560**	**422**	**75**	**389**	**13**	**67**	**154**	**86**	**8**	**124**	**158**	**2342**

	New	(Passby)
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter					12.0%		7.0%					7.0%	
Trip Assignment % - New Exit	7.0%	12.0%	7.0%										
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips	14	22	14		18		10					10	88
Passby Trips													0
Base Redistribution		-2											-2
2027 Projected Volumes	**224**	**523**	**401**	**74**	**393**	**13**	**69**	**153**	**85**	**8**	**123**	**151**	**2217**
2032 Projected Volumes - Without SHIP	**226**	**527**	**404**	**75**	**396**	**13**	**70**	**154**	**86**	**8**	**124**	**152**	**2235**
2032 Projected Volumes - With SHIP	**300**	**580**	**436**	**75**	**407**	**13**	**77**	**154**	**86**	**8**	**124**	**168**	**2428**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**127**	**417**	**37**	**54**	**389**	**5**	**53**	**83**	**59**	**8**	**83**	**103**	**1418**
Balancing													0
2024 Existing Volumes (Balanced)	**127**	**417**	**37**	**54**	**389**	**5**	**53**	**83**	**59**	**8**	**83**	**103**	**1418**
Base growth (0.17% compounded for 3 yrs)	1	2	0	0	2	0	0	0	0	0	0	1	6
Base growth (0.17% compounded for 8 yrs)	2	6	1	1	5	0	1	1	1	0	1	1	20
Spring House Mixed Use Development (SHIP)	11	8	5		8		5					11	48
2027 Base Volumes	**128**	**419**	**37**	**54**	**391**	**5**	**53**	**83**	**59**	**8**	**83**	**104**	**1424**
2032 Base Volumes - Without SHIP	**129**	**423**	**38**	**55**	**394**	**5**	**54**	**84**	**60**	**8**	**84**	**104**	**1438**
2032 Base Volumes - With SHIP	**140**	**431**	**43**	**55**	**402**	**5**	**59**	**84**	**60**	**8**	**84**	**115**	**1486**

	New	(Passby)
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter					12.0%		7.0%					7.0%	
Trip Assignment % - New Exit	7.0%	12.0%	7.0%										
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips	13	24	13		23		13					13	99
Passby Trips													0
Base Redistribution		-2			-1								-3
2027 Projected Volumes	**141**	**441**	**50**	**54**	**413**	**5**	**66**	**83**	**59**	**8**	**83**	**117**	**1520**
2032 Projected Volumes - Without SHIP	**142**	**445**	**51**	**55**	**416**	**5**	**67**	**84**	**60**	**8**	**84**	**117**	**1534**
2032 Projected Volumes - With SHIP	**153**	**453**	**56**	**55**	**424**	**5**	**72**	**84**	**60**	**8**	**84**	**128**	**1582**

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1/27/2026
Traffic Volumes Worksheet

Intersection:	**Norristown Road & SHIP Driveway/Springhouse Estates**										
Synchro Node:	**6**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**	

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**27**	**963**	**21**	**17**	**1140**	**10**	**7**	**0**	**10**	**7**	**0**	**5**	**2207**
Balancing													0
2024 Existing Volumes (Balanced)	**27**	**963**	**21**	**17**	**1140**	**10**	**7**	**0**	**10**	**7**	**0**	**5**	**2207**
Base growth (0.17% compounded for 3 yrs)		5			6								11
Base growth (0.17% compounded for 8 yrs)		13			16								29
Spring House Mixed Use Development (SHIP)	164	61			39	161				50		37	512
2027 Base Volumes	**27**	**968**	**21**	**17**	**1146**	**10**	**7**	**0**	**10**	**7**	**0**	**5**	**2218**
2032 Base Volumes - Without SHIP	**27**	**976**	**21**	**17**	**1156**	**10**	**7**	**0**	**10**	**7**	**0**	**5**	**2236**
2032 Base Volumes - With SHIP	**191**	**1037**	**21**	**17**	**1195**	**171**	**7**	**0**	**10**	**57**	**0**	**42**	**2748**

	New	**(Passby)**
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter		56.0%											
Trip Assignment % - New Exit					56.0%								
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		100			74								174
Passby Trips													0
Base Redistribution		-5			-1								-6
2027 Projected Volumes	**27**	**1063**	**21**	**17**	**1219**	**10**	**7**	**0**	**10**	**7**	**0**	**5**	**2386**
2032 Projected Volumes - Without SHIP	**27**	**1071**	**21**	**17**	**1229**	**10**	**7**	**0**	**10**	**7**	**0**	**5**	**2404**
2032 Projected Volumes - With SHIP	**191**	**1132**	**21**	**17**	**1268**	**171**	**7**	**0**	**10**	**57**	**0**	**42**	**2916**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**6**	**1233**	**15**	**15**	**853**	**3**	**13**	**0**	**39**	**50**	**0**	**44**	**2271**
Balancing													0
2024 Existing Volumes (Balanced)	**6**	**1233**	**15**	**15**	**853**	**3**	**13**	**0**	**39**	**50**	**0**	**44**	**2271**
Base growth (0.17% compounded for 3 yrs)		6			4								10
Base growth (0.17% compounded for 8 yrs)		17			12								29
Spring House Mixed Use Development (SHIP)	33	38			59	34				209		159	532
2027 Base Volumes	**6**	**1239**	**15**	**15**	**857**	**3**	**13**	**0**	**39**	**50**	**0**	**44**	**2281**
2032 Base Volumes - Without SHIP	**6**	**1250**	**15**	**15**	**865**	**3**	**13**	**0**	**39**	**50**	**0**	**44**	**2300**
2032 Base Volumes - With SHIP	**39**	**1288**	**15**	**15**	**924**	**37**	**13**	**0**	**39**	**259**	**0**	**203**	**2832**

	New	**(Passby)**
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter		56.0%											
Trip Assignment % - New Exit					56.0%								
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		81			109								190
Passby Trips													0
Base Redistribution		-4			-5								-9
2027 Projected Volumes	**6**	**1316**	**15**	**15**	**961**	**3**	**13**	**0**	**39**	**50**	**0**	**44**	**2462**
2032 Projected Volumes - Without SHIP	**6**	**1327**	**15**	**15**	**969**	**3**	**13**	**0**	**39**	**50**	**0**	**44**	**2481**
2032 Projected Volumes - With SHIP	**39**	**1365**	**15**	**15**	**1028**	**37**	**13**	**0**	**39**	**259**	**0**	**203**	**3013**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2024 Existing Counts	**0**	**727**	**15**	**20**	**731**	**0**	**8**	**0**	**14**	**7**	**0**	**0**	**1522**
Balancing													0
2024 Existing Volumes (Balanced)	**0**	**727**	**15**	**20**	**731**	**0**	**8**	**0**	**14**	**7**	**0**	**0**	**1522**
Base growth (0.17% compounded for 3 yrs)		4			4								8
Base growth (0.17% compounded for 8 yrs)		10			10								20
Spring House Mixed Use Development (SHIP)	24	12			8	23				31		24	122
2027 Base Volumes	**0**	**731**	**15**	**20**	**735**	**0**	**8**	**0**	**14**	**7**	**0**	**0**	**1530**
2032 Base Volumes - Without SHIP	**0**	**737**	**15**	**20**	**741**	**0**	**8**	**0**	**14**	**7**	**0**	**0**	**1542**
2032 Base Volumes - With SHIP	**24**	**749**	**15**	**20**	**749**	**23**	**8**	**0**	**14**	**38**	**0**	**24**	**1664**

	New	**(Passby)**
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter		56.0%											
Trip Assignment % - New Exit					56.0%								
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		107			107								214
Passby Trips													0
Base Redistribution		-1			-1								-2
2027 Projected Volumes	**0**	**837**	**15**	**20**	**841**	**0**	**8**	**0**	**14**	**7**	**0**	**0**	**1742**
2032 Projected Volumes - Without SHIP	**0**	**843**	**15**	**20**	**847**	**0**	**8**	**0**	**14**	**7**	**0**	**0**	**1754**
2032 Projected Volumes - With SHIP	**24**	**855**	**15**	**20**	**855**	**23**	**8**	**0**	**14**	**38**	**0**	**24**	**1876**

TPD# BETI.012
1/27/2026
Traffic Volumes Worksheet

Intersection:	**Norristown Road & Mckean Road**								
Synchro Node:	**7**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2025 Existing Counts	**171**	**828**			**803**	**207**				**152**		**113**	**2274**
Balancing													0
2025 Existing Volumes (Balanced)	**171**	**828**			**803**	**207**				**152**		**113**	**2274**
Base growth (0.17% compounded for 2 yrs)	1	3			3	1				1		0	9
Base growth (0.17% compounded for 7 yrs)	2	10			10	2				2		1	27
Spring House Mixed Use Development (SHIP)	27	219			49	27				6		6	334
2027 Base Volumes	**172**	**831**			**806**	**208**				**153**		**113**	**2283**
2032 Base Volumes - Without SHIP	**173**	**838**			**813**	**209**				**154**		**114**	**2301**
2032 Base Volumes - With SHIP	**200**	**1057**			**862**	**236**				**160**		**120**	**2635**

	New (Passby)	
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter		50.0%								6.0%			
Trip Assignment % - New Exit					50.0%	6.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		89			66	8				11			174
Passby Trips													0
Base Redistribution		-5			-1								-6
2027 Projected Volumes	**172**	**915**			**871**	**216**				**164**		**113**	**2451**
2032 Projected Volumes - Without SHIP	**173**	**922**			**878**	**217**				**165**		**114**	**2469**
2032 Projected Volumes - With SHIP	**200**	**1141**			**927**	**244**				**171**		**120**	**2803**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2025 Existing Counts	**104**	**973**			**792**	**116**				**229**		**179**	**2393**
Balancing													0
2025 Existing Volumes (Balanced)	**104**	**973**			**792**	**116**				**229**		**179**	**2393**
Base growth (0.17% compounded for 2 yrs)	0	3			3	0				1		1	8
Base growth (0.17% compounded for 7 yrs)	1	12			10	1				3		2	29
Spring House Mixed Use Development (SHIP)	6	44			212	6				27		27	322
2027 Base Volumes	**104**	**976**			**795**	**116**				**230**		**180**	**2401**
2032 Base Volumes - Without SHIP	**105**	**985**			**802**	**117**				**232**		**181**	**2422**
2032 Base Volumes - With SHIP	**111**	**1029**			**1014**	**123**				**259**		**208**	**2744**

	New (Passby)	
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

Trip Assignment % - New Enter		50.0%								6.0%			
Trip Assignment % - New Exit					50.0%	6.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		72			97	12				9			190
Passby Trips													0
Base Redistribution		-4			-5								-9
2027 Projected Volumes	**104**	**1044**			**887**	**128**				**239**		**180**	**2582**
2032 Projected Volumes - Without SHIP	**105**	**1053**			**894**	**129**				**241**		**181**	**2603**
2032 Projected Volumes - With SHIP	**111**	**1097**			**1106**	**135**				**268**		**208**	**2925**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2025 Existing Counts	**101**	**529**			**526**	**69**				**90**		**110**	**1425**
Balancing													0
2025 Existing Volumes (Balanced)	**101**	**529**			**526**	**69**				**90**		**110**	**1425**
Base growth (0.17% compounded for 2 yrs)	0	2			2	0				0		0	4
Base growth (0.17% compounded for 7 yrs)	1	6			6	1				1		1	16
Spring House Mixed Use Development (SHIP)	4	32			32	4				4		4	80
2027 Base Volumes	**101**	**531**			**528**	**69**				**90**		**110**	**1429**
2032 Base Volumes - Without SHIP	**102**	**535**			**532**	**70**				**91**		**111**	**1441**
2032 Base Volumes - With SHIP	**106**	**567**			**564**	**74**				**95**		**115**	**1521**

	New (Passby)	
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter		50.0%								6.0%			
Trip Assignment % - New Exit					50.0%	6.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		96			95	12				11			214
Passby Trips													0
Base Redistribution		-1			-1								-2
2027 Projected Volumes	**101**	**626**			**622**	**81**				**101**		**110**	**1641**
2032 Projected Volumes - Without SHIP	**102**	**630**			**626**	**82**				**102**		**111**	**1653**
2032 Projected Volumes - With SHIP	**106**	**662**			**658**	**86**				**106**		**115**	**1733**

TPD# BETI.012
1/27/2026
Traffic Volumes Worksheet

Intersection:	**Sumneytown Pike-Norristown Road & Bethlehem Pike**									
Synchro Node:	**8**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2025 Existing Counts	**49**	**828**	**286**	**142**	**701**	**44**	**204**	**265**	**154**	**87**	**395**	**57**	**3212**
Balancing													0
2025 Existing Volumes (Balanced)	**49**	**828**	**286**	**142**	**701**	**44**	**204**	**265**	**154**	**87**	**395**	**57**	**3212**
Base growth (0.17% compounded for 2 yrs)	0	3	1	0	2	0	1	1	1	0	1	0	10
Base growth (0.17% compounded for 7 yrs)	1	10	3	2	8	1	2	3	2	1	5	1	39
Spring House Mixed Use Development (SHIP)		87		21	20	15			93	66			302
2027 Base Volumes	**49**	**831**	**287**	**142**	**703**	**44**	**205**	**266**	**155**	**87**	**396**	**57**	**3222**
2032 Base Volumes - Without SHIP	**50**	**838**	**289**	**144**	**709**	**45**	**206**	**268**	**156**	**88**	**400**	**58**	**3251**
2032 Base Volumes - With SHIP	**50**	**925**	**289**	**165**	**729**	**60**	**206**	**268**	**249**	**154**	**400**	**58**	**3553**

	New (Passby)	
ENTER =	**178**	**(28)**
EXIT =	**133**	**(28)**

Trip Assignment % - New Enter		20.0%							17.0%	13.0%			
Trip Assignment % - New Exit				17.0%	20.0%	13.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		36		23	26	17			30	23			155
Passby Trips													0
Base Redistribution		-5			-1								-6
2027 Projected Volumes	**49**	**862**	**287**	**165**	**728**	**61**	**205**	**266**	**185**	**110**	**396**	**57**	**3371**
2032 Projected Volumes - Without SHIP	**50**	**869**	**289**	**167**	**734**	**62**	**206**	**268**	**186**	**111**	**400**	**58**	**3400**
2032 Projected Volumes - With SHIP	**50**	**956**	**289**	**188**	**754**	**77**	**206**	**268**	**279**	**177**	**400**	**58**	**3702**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2025 Existing Counts	**60**	**764**	**195**	**202**	**726**	**80**	**225**	**479**	**184**	**155**	**422**	**42**	**3534**
Balancing													0
2025 Existing Volumes (Balanced)	**60**	**764**	**195**	**202**	**726**	**80**	**225**	**479**	**184**	**155**	**422**	**42**	**3534**
Base growth (0.17% compounded for 2 yrs)	0	3	1	1	2	0	1	2	1	1	1	0	13
Base growth (0.17% compounded for 7 yrs)	1	9	2	2	9	1	3	6	2	2	5	1	43
Spring House Mixed Use Development (SHIP)		17		90	85	64			19	13			288
2027 Base Volumes	**60**	**767**	**196**	**203**	**728**	**80**	**226**	**481**	**185**	**156**	**423**	**42**	**3547**
2032 Base Volumes - Without SHIP	**61**	**773**	**197**	**204**	**735**	**81**	**228**	**485**	**186**	**157**	**427**	**43**	**3577**
2032 Base Volumes - With SHIP	**61**	**790**	**197**	**294**	**820**	**145**	**228**	**485**	**205**	**170**	**427**	**43**	**3865**

	New (Passby)	
ENTER =	**145**	**(68)**
EXIT =	**194**	**(68)**

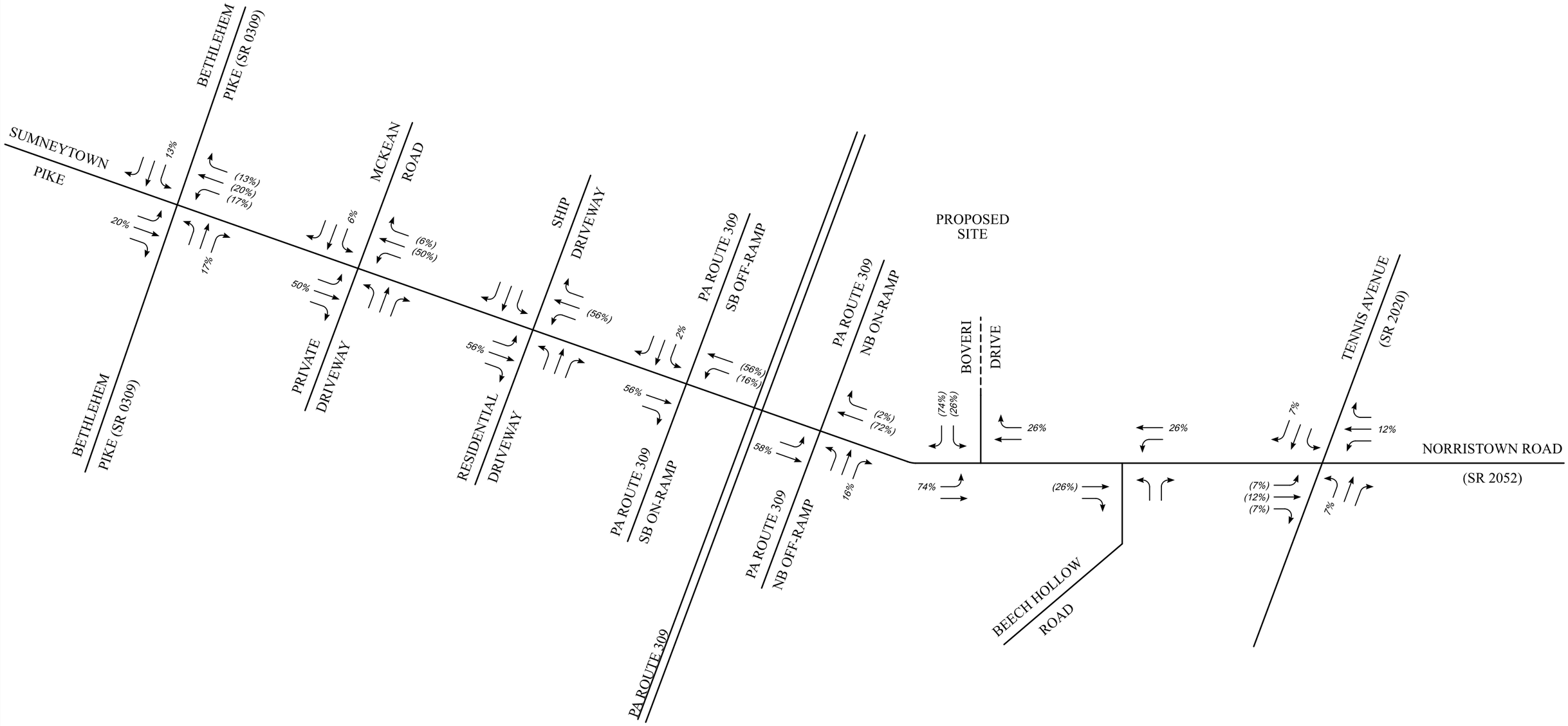
Trip Assignment % - New Enter		20.0%							17.0%	13.0%			
Trip Assignment % - New Exit				17.0%	20.0%	13.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		28		33	39	25			25	19			169
Passby Trips													0
Base Redistribution		-4			-5								-9
2027 Projected Volumes	**60**	**791**	**196**	**236**	**762**	**105**	**226**	**481**	**210**	**175**	**423**	**42**	**3707**
2032 Projected Volumes - Without SHIP	**61**	**797**	**197**	**237**	**769**	**106**	**228**	**485**	**211**	**176**	**427**	**43**	**3737**
2032 Projected Volumes - With SHIP	**61**	**814**	**197**	**327**	**854**	**170**	**228**	**485**	**230**	**189**	**427**	**43**	**4025**

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2025 Existing Counts	**57**	**401**	**175**	**118**	**411**	**95**	**165**	**435**	**110**	**156**	**432**	**64**	**2619**
Balancing													0
2025 Existing Volumes (Balanced)	**57**	**401**	**175**	**118**	**411**	**95**	**165**	**435**	**110**	**156**	**432**	**64**	**2619**
Base growth (0.17% compounded for 2 yrs)	0	1	1	0	1	0	1	1	0	1	1	0	7
Base growth (0.17% compounded for 7 yrs)	1	5	2	1	5	1	2	5	1	2	5	1	31
Spring House Mixed Use Development (SHIP)		13		14	13	10			14	10			74
2027 Base Volumes	**57**	**402**	**176**	**118**	**412**	**95**	**166**	**436**	**110**	**157**	**433**	**64**	**2626**
2032 Base Volumes - Without SHIP	**58**	**406**	**177**	**119**	**416**	**96**	**167**	**440**	**111**	**158**	**437**	**65**	**2650**
2032 Base Volumes - With SHIP	**58**	**419**	**177**	**133**	**429**	**106**	**167**	**440**	**125**	**168**	**437**	**65**	**2724**

	New (Passby)	
ENTER =	**190**	**(57)**
EXIT =	**192**	**(57)**

Trip Assignment % - New Enter		20.0%							17.0%	13.0%			
Trip Assignment % - New Exit				17.0%	20.0%	13.0%							
Trip Assignment % - PBy Enter													
Trip Assignment % - Pby Exit													
New Trips		39		33	37	25			32	25			191
Passby Trips													0
Base Redistribution		-1			-1								-2
2027 Projected Volumes	**57**	**440**	**176**	**151**	**448**	**120**	**166**	**436**	**142**	**182**	**433**	**64**	**2815**
2032 Projected Volumes - Without SHIP	**58**	**444**	**177**	**152**	**452**	**121**	**167**	**440**	**143**	**183**	**437**	**65**	**2839**
2032 Projected Volumes - With SHIP	**58**	**457**	**177**	**166**	**465**	**131**	**167**	**440**	**157**	**193**	**437**	**65**	**2913**



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

N

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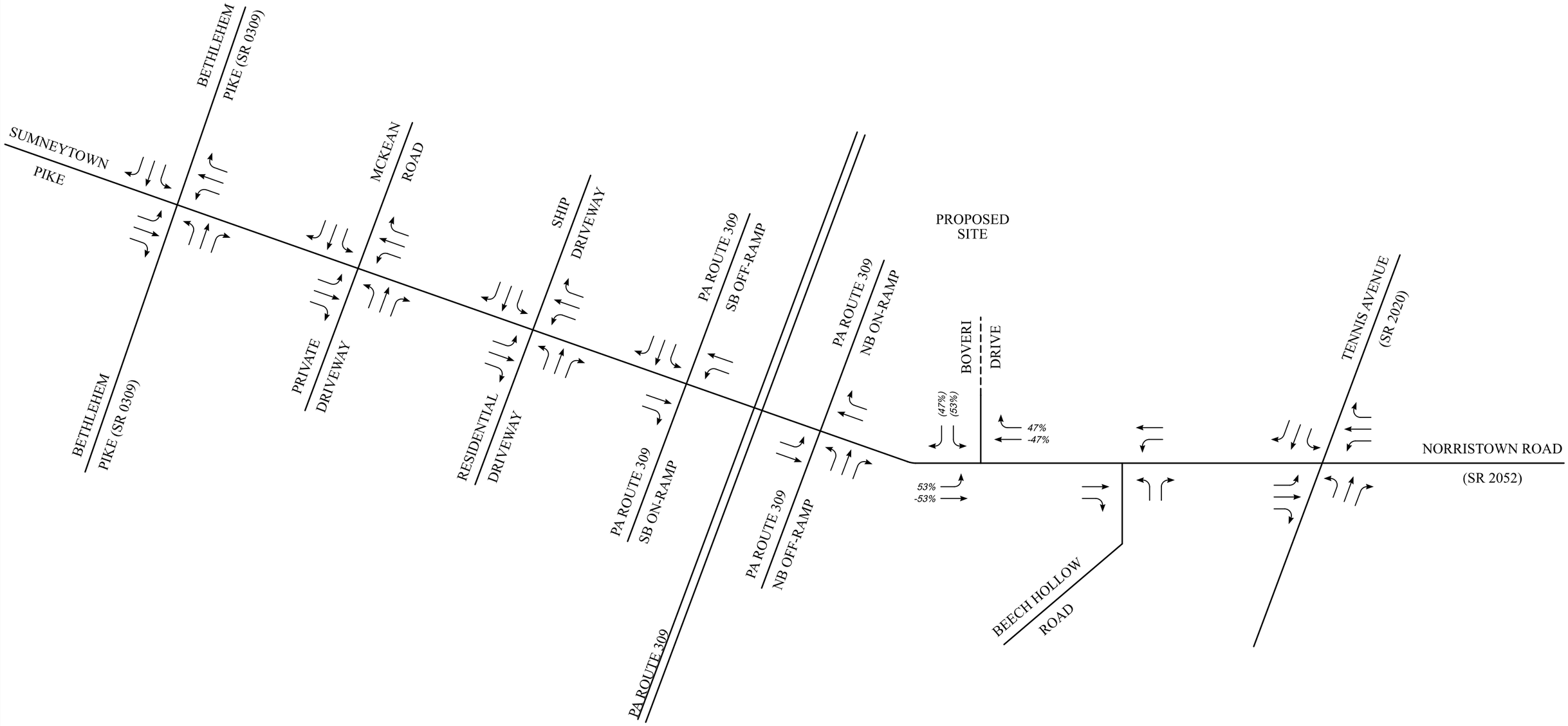
FIGURE F-1

SPRINGHOUSE MIXED USE DEVELOPMENT
WEEKDAY AND WEEKEND PEAK HOURS
NEW TRIP ASSIGNMENT
ENTER % (EXIT %)



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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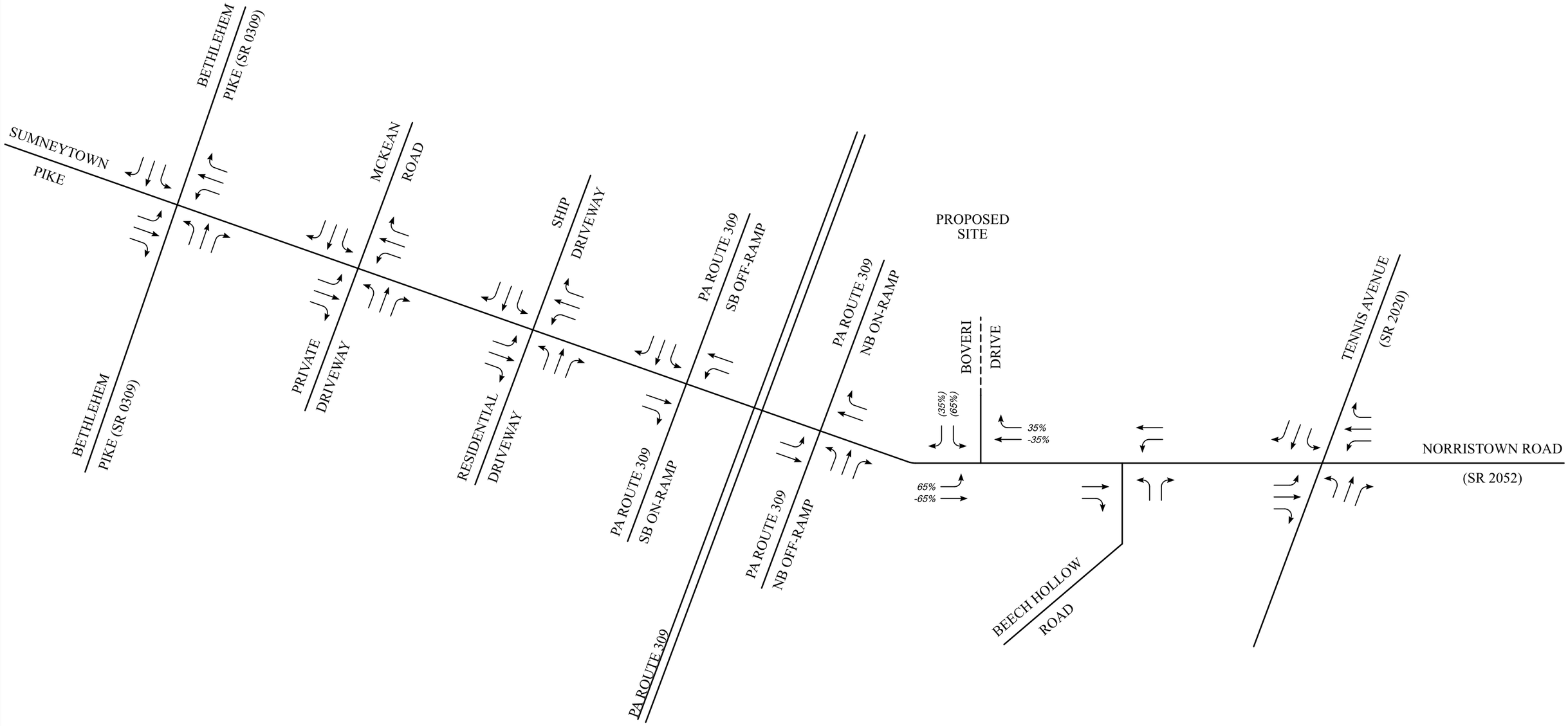
FIGURE F-2

SPRINGHOUSE MIXED USE DEVELOPMENT
WEEKDAY A.M. PEAK HOUR
PASS-BY TRIP ASSIGNMENT
ENTER % (EXIT %)



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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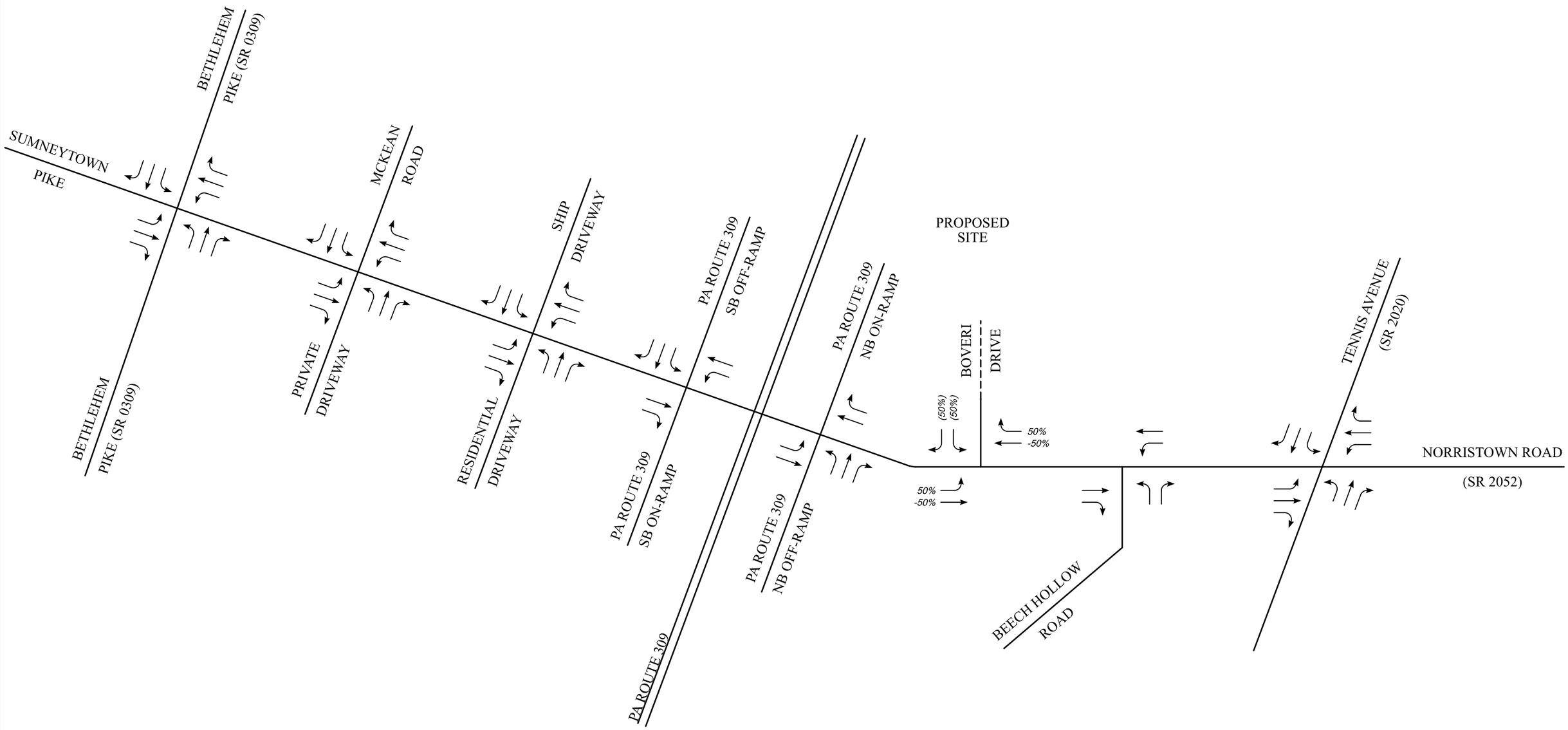
FIGURE F-3

SPRINGHOUSE MIXED USE DEVELOPMENT
WEEKDAY P.M. PEAK HOUR
PASS-BY TRIP ASSIGNMENT
ENTER % (EXIT %)



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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FIGURE F-4

SPRINGHOUSE MIXED USE DEVELOPMENT
SATURDAY MIDDAY PEAK HOUR
PASS-BY TRIP ASSIGNMENT
ENTER % (EXIT %)

APPENDIX G:

Critical/Follow-Up Gap Data

CRITICAL HEADWAY CALCULATIONS FOR TWSC INTERSECTION WITHIN SUBURBAN LAND USE CONTEXT
BASED ON PENNSYLVANIA DEFAULT VALUES FROM CHAPTER 10 OF PENNDOT PUBLICATION 46

$t_{c,x} = t_{c,\,base} + t_{c,HV}{*}P_{HV} + t_{c,G}{*}G - t_{3,LT}$

where:

$t_{c,x}$ = critical headway for movement x (s)
$t_{c,base}$ = base crtitcal headway from Chapter 10 of PennDOT Publication 46
$t_{c,HV}$ = adjustment factor for heavy vehciles (1.0 for major streets with one lane in each direction; 2.0 for major streets with two or three lanes in each direction) (s)
P_{HV} = proportion of heavy vehciles for movement (expressed as a decimal; e.g., P_{HV}=0.02 for 2% heavy vehciles)
$t_{c,G}$ = adjustment factor for grade (0.1 for Movement 9 and 12; 0.2 for Movements 7,8,10, and 11) (s)
G = percent grade (expressed as an integer; e.g., G= -2 for a 2% downhill grade)
$t_{c,base}$ = adjustment factor for intersction geometry (0.7 for minor street left-turn movement at three-leg intersections; 0.0 otherwise) (s)

LEFT TURN FROM MAJOR ROADWAY - FOUR LANES ($t_{c,\,base}$ = 3.9)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
1	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
7	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
9	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
10	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

LEFT TURN FROM MINOR ROADWAY - FOUR LANES - 4-LEG INTERSECTION ($t_{c,\,base}$ = 8.4)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	8.4	8.2	8.6	8.0	8.8	7.8	9.0	7.6	9.2	7.4	9.4	7.2	9.6	7.0	9.8	6.8	10.0	6.6	10.2	6.4	10.4
1	8.4	8.2	8.6	8.0	8.8	7.8	9.0	7.6	9.2	7.4	9.4	7.2	9.6	7.0	9.8	6.8	10.0	6.6	10.2	6.4	10.4
2	8.4	8.2	8.6	8.0	8.8	7.8	9.0	7.6	9.2	7.4	9.4	7.2	9.6	7.0	9.8	6.8	10.0	6.6	10.2	6.4	10.4
3	8.5	8.3	8.7	8.1	8.9	7.9	9.1	7.7	9.3	7.5	9.5	7.3	9.7	7.1	9.9	6.9	10.1	6.7	10.3	6.5	10.5
4	8.5	8.3	8.7	8.1	8.9	7.9	9.1	7.7	9.3	7.5	9.5	7.3	9.7	7.1	9.9	6.9	10.1	6.7	10.3	6.5	10.5
5	8.5	8.3	8.7	8.1	8.9	7.9	9.1	7.7	9.3	7.5	9.5	7.3	9.7	7.1	9.9	6.9	10.1	6.7	10.3	6.5	10.5
6	8.5	8.3	8.7	8.1	8.9	7.9	9.1	7.7	9.3	7.5	9.5	7.3	9.7	7.1	9.9	6.9	10.1	6.7	10.3	6.5	10.5
7	8.5	8.3	8.7	8.1	8.9	7.9	9.1	7.7	9.3	7.5	9.5	7.3	9.7	7.1	9.9	6.9	10.1	6.7	10.3	6.5	10.5
8	8.6	8.4	8.8	8.2	9.0	8.0	9.2	7.8	9.4	7.6	9.6	7.4	9.8	7.2	10.0	7.0	10.2	6.8	10.4	6.6	10.6
9	8.6	8.4	8.8	8.2	9.0	8.0	9.2	7.8	9.4	7.6	9.6	7.4	9.8	7.2	10.0	7.0	10.2	6.8	10.4	6.6	10.6
10	8.6	8.4	8.8	8.2	9.0	8.0	9.2	7.8	9.4	7.6	9.6	7.4	9.8	7.2	10.0	7.0	10.2	6.8	10.4	6.6	10.6

THROUGH TRAFFIC ON MINOR ROADWAY - FOUR LANES ($t_{c,\,base}$ = 6.5)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
1	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
2	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
3	6.6	6.4	6.8	6.2	7.0	6.0	7.2	5.8	7.4	5.6	7.6	5.4	7.8	5.2	8.0	5.0	8.2	4.8	8.4	4.6	8.6
4	6.6	6.4	6.8	6.2	7.0	6.0	7.2	5.8	7.4	5.6	7.6	5.4	7.8	5.2	8.0	5.0	8.2	4.8	8.4	4.6	8.6
5	6.6	6.4	6.8	6.2	7.0	6.0	7.2	5.8	7.4	5.6	7.6	5.4	7.8	5.2	8.0	5.0	8.2	4.8	8.4	4.6	8.6
6	6.6	6.4	6.8	6.2	7.0	6.0	7.2	5.8	7.4	5.6	7.6	5.4	7.8	5.2	8.0	5.0	8.2	4.8	8.4	4.6	8.6
7	6.6	6.4	6.8	6.2	7.0	6.0	7.2	5.8	7.4	5.6	7.6	5.4	7.8	5.2	8.0	5.0	8.2	4.8	8.4	4.6	8.6
8	6.7	6.5	6.9	6.3	7.1	6.1	7.3	5.9	7.5	5.7	7.7	5.5	7.9	5.3	8.1	5.1	8.3	4.9	8.5	4.7	8.7
9	6.7	6.5	6.9	6.3	7.1	6.1	7.3	5.9	7.5	5.7	7.7	5.5	7.9	5.3	8.1	5.1	8.3	4.9	8.5	4.7	8.7
10	6.7	6.5	6.9	6.3	7.1	6.1	7.3	5.9	7.5	5.7	7.7	5.5	7.9	5.3	8.1	5.1	8.3	4.9	8.5	4.7	8.7

RIGHT TURN FROM MINOR ROADWAY - FOUR LANES ($t_{c,\,base}$ = 7.2)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	7.2	7.1	7.3	7.0	7.4	6.9	7.5	6.8	7.6	6.7	7.7	6.6	7.8	6.5	7.9	6.4	8.0	6.3	8.1	6.2	8.2
1	7.2	7.1	7.3	7.0	7.4	6.9	7.5	6.8	7.6	6.7	7.7	6.6	7.8	6.5	7.9	6.4	8.0	6.3	8.1	6.2	8.2
2	7.2	7.1	7.3	7.0	7.4	6.9	7.5	6.8	7.6	6.7	7.7	6.6	7.8	6.5	7.9	6.4	8.0	6.3	8.1	6.2	8.2
3	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
4	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
5	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
6	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
7	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
8	7.4	7.3	7.5	7.2	7.6	7.1	7.7	7.0	7.8	6.9	7.9	6.8	8.0	6.7	8.1	6.6	8.2	6.5	8.3	6.4	8.4
9	7.4	7.3	7.5	7.2	7.6	7.1	7.7	7.0	7.8	6.9	7.9	6.8	8.0	6.7	8.1	6.6	8.2	6.5	8.3	6.4	8.4
10	7.4	7.3	7.5	7.2	7.6	7.1	7.7	7.0	7.8	6.9	7.9	6.8	8.0	6.7	8.1	6.6	8.2	6.5	8.3	6.4	8.4

CRITICAL HEADWAY CALCULATIONS FOR TWSC INTERSECTION WITHIN SUBURBAN LAND USE CONTEXT
BASED ON PENNSYLVANIA DEFAULT VALUES FROM CHAPTER 10 OF PENNDOT PUBLICATION 46

$t_{c,x} = t_{c,\,base} + t_{c,HV}*P_{HV} + t_{c,G}*G - t_{3,LT}$

where:

$t_{c,x}$ = critical headway for movement x (s)
$t_{c,base}$ = base crtitcal headway from Chapter 10 of PennDOT Publication 46
$t_{c,HV}$ = adjustment factor for heavy vehciles (1.0 for major streets with one lane in each direction; 2.0 for major streets with two or three lanes in each direction) (s)
P_{HV} = proportion of heavy vehciles for movement (expressed as a decimal; e.g., P_{HV}=0.02 for 2% heavy vehciles)
$t_{c,G}$ = adjustment factor for grade (0.1 for Movement 9 and 12; 0.2 for Movements 7,8,10, and 11) (s)
G = percent grade (expressed as an integer; e.g., G= -2 for a 2% downhill grade)
$t_{c,base}$ = adjustment factor for intersction geometry (0.7 for minor street left-turn movement at three-leg intersections; 0.0 otherwise) (s)

LEFT TURN FROM MAJOR ROADWAY - FOUR LANES ($t_{c,\,base}$ = 3.9)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
1	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
7	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
9	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
10	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

LEFT TURN FROM MINOR ROADWAY - FOUR LANES - 3-LEG INTERSECTION ($t_{c,\,base}$ = 8.4)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	7.7	7.5	7.9	7.3	8.1	7.1	8.3	6.9	8.5	6.7	8.7	6.5	8.9	6.3	9.1	6.1	9.3	5.9	9.5	5.7	9.7
1	7.7	7.5	7.9	7.3	8.1	7.1	8.3	6.9	8.5	6.7	8.7	6.5	8.9	6.3	9.1	6.1	9.3	5.9	9.5	5.7	9.7
2	7.7	7.5	7.9	7.3	8.1	7.1	8.3	6.9	8.5	6.7	8.7	6.5	8.9	6.3	9.1	6.1	9.3	5.9	9.5	5.7	9.7
3	7.8	7.6	8.0	7.4	8.2	7.2	8.4	7.0	8.6	6.8	8.8	6.6	9.0	6.4	9.2	6.2	9.4	6.0	9.6	5.8	9.8
4	7.8	7.6	8.0	7.4	8.2	7.2	8.4	7.0	8.6	6.8	8.8	6.6	9.0	6.4	9.2	6.2	9.4	6.0	9.6	5.8	9.8
5	7.8	7.6	8.0	7.4	8.2	7.2	8.4	7.0	8.6	6.8	8.8	6.6	9.0	6.4	9.2	6.2	9.4	6.0	9.6	5.8	9.8
6	7.8	7.6	8.0	7.4	8.2	7.2	8.4	7.0	8.6	6.8	8.8	6.6	9.0	6.4	9.2	6.2	9.4	6.0	9.6	5.8	9.8
7	7.8	7.6	8.0	7.4	8.2	7.2	8.4	7.0	8.6	6.8	8.8	6.6	9.0	6.4	9.2	6.2	9.4	6.0	9.6	5.8	9.8
8	7.9	7.7	8.1	7.5	8.3	7.3	8.5	7.1	8.7	6.9	8.9	6.7	9.1	6.5	9.3	6.3	9.5	6.1	9.7	5.9	9.9
9	7.9	7.7	8.1	7.5	8.3	7.3	8.5	7.1	8.7	6.9	8.9	6.7	9.1	6.5	9.3	6.3	9.5	6.1	9.7	5.9	9.9
10	7.9	7.7	8.1	7.5	8.3	7.3	8.5	7.1	8.7	6.9	8.9	6.7	9.1	6.5	9.3	6.3	9.5	6.1	9.7	5.9	9.9

RIGHT TURN FROM MINOR ROADWAY - FOUR LANES ($t_{c,\,base}$ = 7.2)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	7.2	7.1	7.3	7.0	7.4	6.9	7.5	6.8	7.6	6.7	7.7	6.6	7.8	6.5	7.9	6.4	8.0	6.3	8.1	6.2	8.2
1	7.2	7.1	7.3	7.0	7.4	6.9	7.5	6.8	7.6	6.7	7.7	6.6	7.8	6.5	7.9	6.4	8.0	6.3	8.1	6.2	8.2
2	7.2	7.1	7.3	7.0	7.4	6.9	7.5	6.8	7.6	6.7	7.7	6.6	7.8	6.5	7.9	6.4	8.0	6.3	8.1	6.2	8.2
3	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
4	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
5	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
6	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
7	7.3	7.2	7.4	7.1	7.5	7.0	7.6	6.9	7.7	6.8	7.8	6.7	7.9	6.6	8.0	6.5	8.1	6.4	8.2	6.3	8.3
8	7.4	7.3	7.5	7.2	7.6	7.1	7.7	7.0	7.8	6.9	7.9	6.8	8.0	6.7	8.1	6.6	8.2	6.5	8.3	6.4	8.4
9	7.4	7.3	7.5	7.2	7.6	7.1	7.7	7.0	7.8	6.9	7.9	6.8	8.0	6.7	8.1	6.6	8.2	6.5	8.3	6.4	8.4
10	7.4	7.3	7.5	7.2	7.6	7.1	7.7	7.0	7.8	6.9	7.9	6.8	8.0	6.7	8.1	6.6	8.2	6.5	8.3	6.4	8.4

FOLLOW-UP HEADWAY CALCULATIONS FOR TWSC INTERSECTION WITHIN SUBURBAN LAND USE CONTEXT
BASED ON PENNSYLVANIA DEFAULT VALUES FROM CHAPTER 10 OF PENNDOT PUBLICATION 46

$t_{f,x} = t_{f,\,base} + t_{f,HV} * P_{HV}$

where:

$t_{f,x}$ = follow-up headway for movement x (s)
$t_{f,base}$ = base follow-up headway from Chapter 10 of PennDOT Publication 46
$t_{f,HV}$ = adjustment factor for heavy vehciles (0.9 for major streets with one lane in each direction; 1.0 for major streets with two or three lanes in each direction) (s)
P_{HV} = proportion of heavy vehciles for movement (expressed as a decimal; e.g., P_{HV}=0.02 for 2% heavy vehciles)

LEFT TURN FROM MAJOR ROADWAY - FOUR LANES ($t_{f,\,base}$ = 2.4)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
10	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

LEFT TURN FROM MINOR ROADWAY - FOUR LANES ($t_{f,\,base}$ = 2.8)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
2	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
4	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
5	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
6	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
7	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
10	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9

THROUGH TRAFFIC ON MINOR ROADWAY - TWO LANES ($t_{f,\,base}$ = 4.0)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
5	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
6	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
9	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
10	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

RIGHT TURN FROM MINOR ROADWAY - FOUR LANES ($t_{f,\,base}$ = 2.9)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
1	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
2	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
3	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
4	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

APPENDIX H:

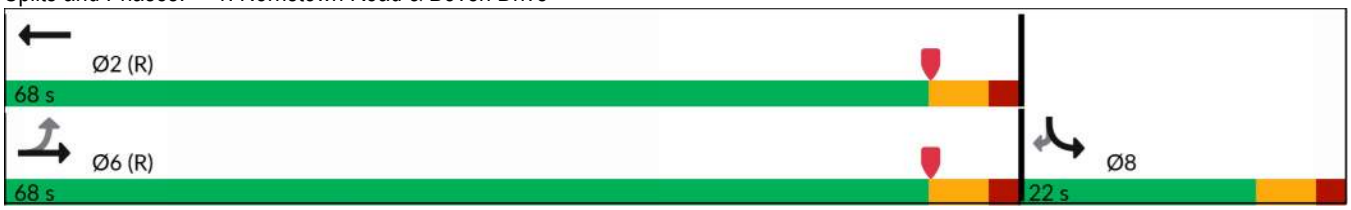
Capacity Analyses

Existing Conditions

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	712	642	8	1	2
Future Volume (vph)	8	712	642	8	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3214	0	1906	1137
Flt Permitted	0.394				0.950	
Satd. Flow (perm)	692	3211	3214	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			2
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	8	742	669	8	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	742	677	0	1	2
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	68.0	68.0	68.0		22.0	22.0
Total Split (%)	75.6%	75.6%	75.6%		24.4%	24.4%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	712	642	8	1	2
Future Volume (veh/h)	8	712	642	8	1	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	8	742	669	8	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	749	3026	2976	36	27	16
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.01
Sat Flow, veh/h	764	3544	3485	41	2115	1255
Grp Volume(v), veh/h	8	742	330	347	1	1
Grp Sat Flow(s),veh/h/ln	764	1727	1678	1759	2115	1255
Q Serve(g_s), s	0.1	3.1	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.1	3.1	0.0	0.0	0.0	0.1
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	749	3026	1470	1541	27	16
V/C Ratio(X)	0.01	0.25	0.22	0.22	0.04	0.06
Avail Cap(c_a), veh/h	749	3026	1470	1541	400	237
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.7	0.9	0.0	0.0	43.9	43.9
Incr Delay (d2), s/veh	0.0	0.2	0.4	0.3	0.6	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.3	0.3	0.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.1	0.4	0.3	44.4	45.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		750	677		2	
Approach Delay, s/veh		1.1	0.3		45.0	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	83.9			83.9	6.1
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	62.0			62.0	16.0
Max Q Clear Time (g_c+I1), s	2.0			5.1	2.1
Green Ext Time (p_c), s	23.6			26.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	719	1	0	654	3	2
Future Volume (vph)	719	1	0	654	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	757	1	0	688	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	758	0	0	688	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	719	1	0	654	3	2
Future Vol, veh/h	719	1	0	654	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	757	1	0	688	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	758	0	1102	379
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	344	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	997	-	*772	*1025
Stage 1	-	-	-	-	*757	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	997	-	*772	*1025
Mov Cap-2 Maneuver	-	-	-	-	*772	-
Stage 1	-	-	-	-	*757	-
Stage 2	-	-	-	-	*994	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	857	-	-	997	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	477	0	0	620	25	752	0	249	0	0	0
Future Volume (vph)	4	477	0	0	620	25	752	0	249	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.994				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5799	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5799	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					8				235			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	4	487	0	0	633	26	767	0	254	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	4	487	0	0	659	0	383	384	254	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				22.0		28.0	28.0	28.0			
Total Split (%)	14.4%				24.4%		31.1%	31.1%	31.1%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.9	56.9			21.2		23.1	23.1	23.1			
Actuated g/C Ratio	0.09	0.63			0.24		0.26	0.26	0.26			
v/c Ratio	0.03	0.24			0.47		0.93	0.93	0.44			
Control Delay (s/veh)	17.5	1.8			22.5		64.9	65.3	7.7			
Queue Delay	0.0	0.2			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	17.5	2.0			22.5		64.9	65.3	7.7			

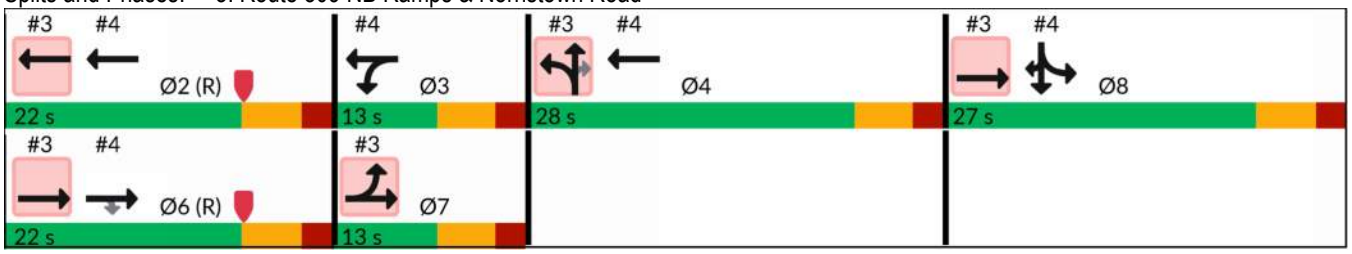
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	13.0	22.0	27.0
Total Split (%)	14%	24%	30%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		E	E	A			
Approach Delay (s/veh)		2.2			22.6			50.9				
Approach LOS		A			C			D				
Queue Length 50th (ft)	2	13			85		224	225	8			
Queue Length 95th (ft)	m6	36			99		#407	#408	67			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	116	1922			1374		411	411	565			
Starvation Cap Reductn	0	737			0		0	0	0			
Spillback Cap Reductn	0	0			32		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.41			0.49		0.93	0.93	0.45			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay (s/veh): 31.3 Intersection LOS: C
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	450	527	168	1200	0	0	0	0	45	0	23
Future Volume (vph)	0	450	527	168	1200	0	0	0	0	45	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1694
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			532									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	455	532	170	1212	0	0	0	0	45	0	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	455	532	170	1212	0	0	0	0	0	45	23
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		22.0	22.0	13.0						27.0	27.0	27.0
Total Split (%)		24.4%	24.4%	14.4%						30.0%	30.0%	30.0%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		21.2	21.2	7.9	62.2						17.8	17.8
Actuated g/C Ratio		0.24	0.24	0.09	0.69						0.20	0.20
v/c Ratio		0.42	0.72	0.61	0.54						0.14	0.04
Control Delay (s/veh)		29.6	13.4	51.0	3.3						30.1	0.1
Queue Delay		0.0	0.0	0.0	1.7						0.0	0.0
Total Delay (s/veh)		29.6	13.4	51.0	5.1						30.1	0.1

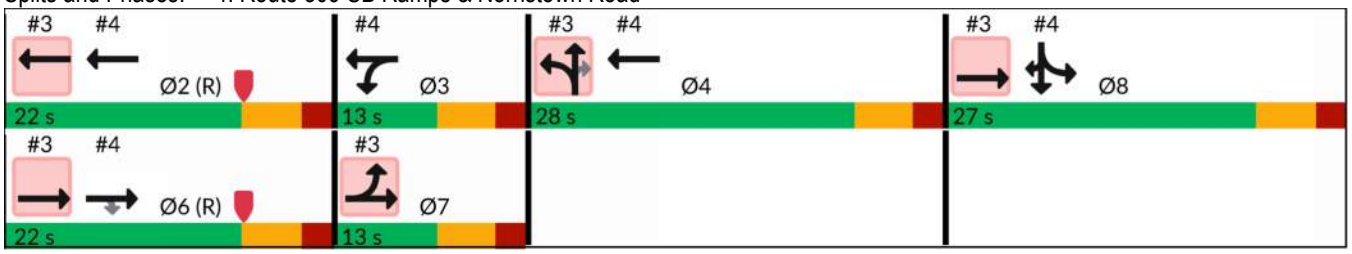
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	22.0	28.0	13.0
Total Split (%)	24%	31%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	B	D	A						C	A
Approach Delay (s/veh)		20.9			10.8						20.0	
Approach LOS		C			B						B	
Queue Length 50th (ft)		79	0	54	23						22	0
Queue Length 95th (ft)		119	#226	m72	m39						48	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1062	729	280	2177						384	557
Starvation Cap Reductn		0	0	0	752						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.43	0.73	0.61	0.85						0.12	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay (s/veh): 15.1 Intersection LOS: B
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

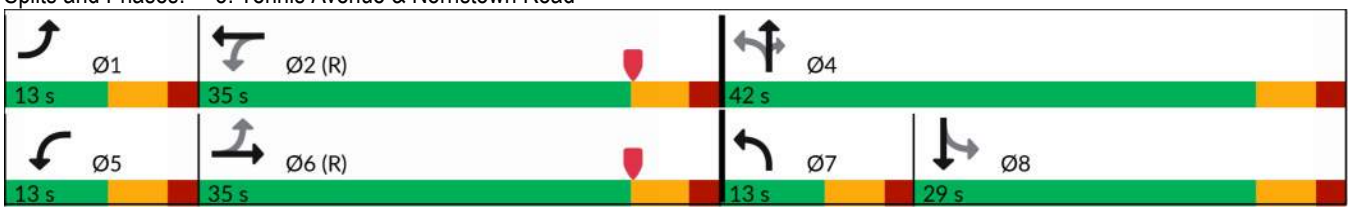
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	464	39	103	396	4	47	94	88	3	166	194
Future Volume (vph)	215	464	39	103	396	4	47	94	88	3	166	194
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.988			0.999				0.850		0.928	
Flt Protected	0.950			0.950				0.984				
Satd. Flow (prot)	1652	3223	0	1613	1759	0	0	1660	1465	0	1535	0
Flt Permitted	0.303			0.442				0.680			0.998	
Satd. Flow (perm)	527	3223	0	750	1759	0	0	1147	1465	0	1532	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		63	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	234	504	42	112	430	4	51	102	96	3	180	211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	234	546	0	112	434	0	0	153	96	0	394	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	35.0		13.0	35.0		13.0	42.0	42.0	29.0	29.0	
Total Split (%)	14.4%	38.9%		14.4%	38.9%		14.4%	46.7%	46.7%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	51.1	41.1		44.9	35.9			27.3	27.3		27.3	
Actuated g/C Ratio	0.57	0.46		0.50	0.40			0.30	0.30		0.30	
v/c Ratio	0.52	0.37		0.24	0.61			0.44	0.18		0.77	
Control Delay (s/veh)	17.7	9.4		11.6	28.2			28.0	4.0		34.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	17.7	9.4		11.6	28.2			28.0	4.0		34.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A		B	C			C	A		C	
Approach Delay (s/veh)		11.9			24.9			18.8			34.2	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	24	50		27	201			69	0		170	
Queue Length 95th (ft)	118	83		62	329			111	25		248	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	446	1471		464	702			471	666		525	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.52	0.37		0.24	0.62			0.32	0.14		0.75	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay (s/veh): 20.8 Intersection LOS: C
Intersection Capacity Utilization 81.5% ICU Level of Service D
Analysis Period (min) 15

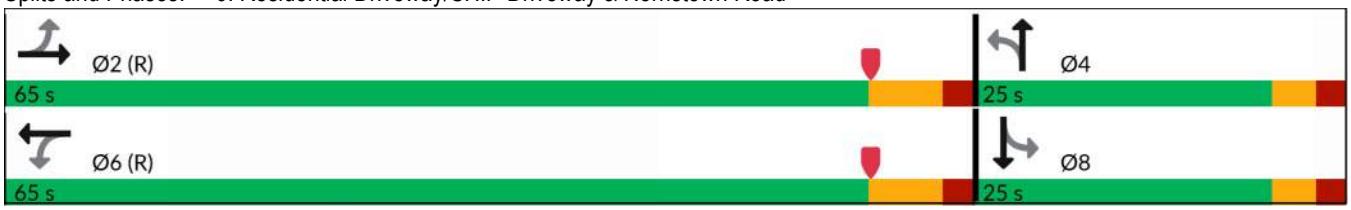
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	963	21	17	1140	10	7	0	10	7	0	5
Future Volume (vph)	27	963	21	17	1140	10	7	0	10	7	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.999			0.850			0.850	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3262	0	0	3363	0	1701	1269	0	1492	1522	0
Flt Permitted		0.893			0.931							
Satd. Flow (perm)	0	2916	0	0	3134	0	1791	1269	0	1571	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			149			101	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	28	993	22	18	1175	10	7	0	10	7	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1043	0	0	1203	0	7	10	0	7	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	65.0	65.0		65.0	65.0		25.0	25.0		25.0	25.0	
Total Split (%)	72.2%	72.2%		72.2%	72.2%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	963	21	17	1140	10	7	0	10	7	0	5
Future Volume (veh/h)	27	963	21	17	1140	10	7	0	10	7	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	28	993	21	18	1175	10	7	0	3	7	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	83	2646	55	59	2999	25	111	0	35	106	0	35
Arrive On Green	0.85	0.87	0.85	0.85	0.87	0.85	0.02	0.00	0.01	0.02	0.00	0.01
Sat Flow, veh/h	47	3057	64	21	3464	29	1359	0	1521	1208	0	1521
Grp Volume(v), veh/h	526	0	516	623	0	580	7	0	3	7	0	1
Grp Sat Flow(s),veh/h/ln	1598	0	1570	1819	0	1696	1359	0	1521	1208	0	1521
Q Serve(g_s), s	0.0	0.0	5.9	0.0	0.0	6.3	0.5	0.0	0.2	0.5	0.0	0.1
Cycle Q Clear(g_c), s	5.3	0.0	5.9	6.1	0.0	6.3	0.5	0.0	0.2	0.7	0.0	0.1
Prop In Lane	0.05		0.04	0.03		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1408	0	1359	1596	0	1468	111	0	35	106	0	35
V/C Ratio(X)	0.37	0.00	0.38	0.39	0.00	0.39	0.06	0.00	0.09	0.07	0.00	0.03
Avail Cap(c_a), veh/h	1408	0	1359	1596	0	1468	396	0	355	359	0	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.00	0.62	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.2	0.0	1.2	1.2	0.0	1.2	43.2	0.0	43.5	43.4	0.0	43.5
Incr Delay (d2), s/veh	0.5	0.0	0.5	0.7	0.0	0.8	0.2	0.0	1.0	0.3	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.0	0.3	0.7	0.0	0.6	0.3	0.0	0.1	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	1.6	0.0	1.7	1.9	0.0	2.0	43.5	0.0	44.5	43.6	0.0	43.8
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1042			1203			10			8	
Approach Delay, s/veh		1.7			2.0			43.8			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		83.9		6.1		83.9		6.1				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		58.0		20.0		58.0		20.0				
Max Q Clear Time (g_c+I1), s		0.0		2.5		0.0		2.7				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.2
HCM 6th LOS	A

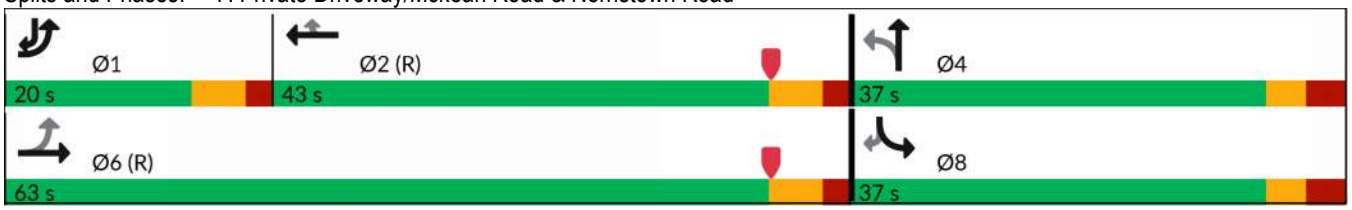
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	828	0	0	803	207	0	0	0	152	0	113
Future Volume (vph)	171	828	0	0	803	207	0	0	0	152	0	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3315	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted		0.588								0.950		
Satd. Flow (perm)	0	1965	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						233						45
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	192	930	0	0	902	233	0	0	0	171	0	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1122	0	0	902	233	0	0	0	171	0	127
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	63.0			43.0	43.0	37.0	37.0		37.0		20.0
Total Split (%)	20.0%	63.0%			43.0%	43.0%	37.0%	37.0%		37.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		73.0			61.2	61.2				17.0		28.8
Actuated g/C Ratio		0.73			0.61	0.61				0.17		0.29
v/c Ratio		0.73			0.43	0.22				0.62		0.27
Control Delay (s/veh)		11.0			11.8	2.0				48.2		18.0
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		11.0			11.8	2.0				48.2		18.0
LOS		B			B	A				D		B
Approach Delay (s/veh)		11.1			9.8						35.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		130			147	0				102		39
Queue Length 95th (ft)		211			225	32				157		77
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1525			2063	1021				513		572
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.74			0.44	0.23				0.33		0.22

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay (s/veh): 13.3 Intersection LOS: B
Intersection Capacity Utilization 73.4% ICU Level of Service D
Analysis Period (min) 15
! Phase conflict between lane groups.

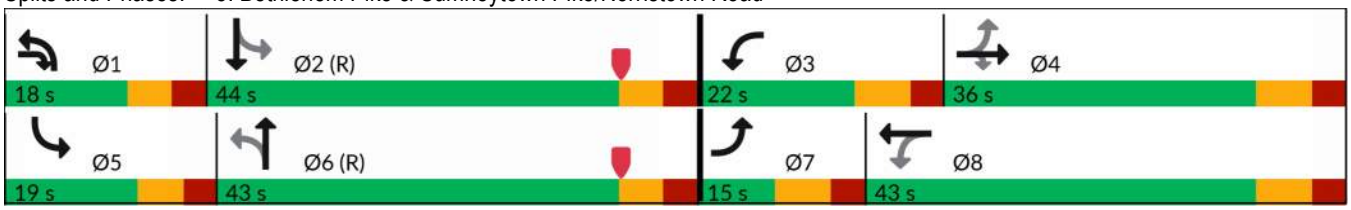
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	828	286	142	701	44	204	265	154	87	395	57
Future Volume (vph)	49	828	286	142	701	44	204	265	154	87	395	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.991			0.945			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3246	0	1528	3060	0	1588	3033	0
Flt Permitted	0.227			0.103			0.358			0.425		
Satd. Flow (perm)	374	3257	1562	181	3246	0	576	3060	0	710	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			207					101			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	53	890	308	153	754	47	219	285	166	94	425	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	890	308	153	801	0	219	451	0	94	486	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	36.0	18.0	22.0	43.0		18.0	43.0		19.0	44.0	
Total Split (%)	12.5%	30.0%	15.0%	18.3%	35.8%		15.0%	35.8%		15.8%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	828	286	142	701	44	204	265	154	87	395	57
Future Volume (veh/h)	49	828	286	142	701	44	204	265	154	87	395	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	53	890	226	153	754	47	219	285	114	94	425	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	191	831	532	226	992	62	477	967	378	466	1190	
Arrive On Green	0.05	0.24	0.24	0.09	0.29	0.28	0.10	0.39	0.38	0.06	0.35	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3463	216	1739	2476	967	1736	3472	0
Grp Volume(v), veh/h	53	890	226	153	394	407	219	201	198	94	425	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1868	1739	1762	1681	1736	1691	0
Q Serve(g_s), s	2.8	29.0	13.4	7.2	23.8	23.9	9.3	9.4	9.8	4.0	11.2	0.0
Cycle Q Clear(g_c), s	2.8	29.0	13.4	7.2	23.8	23.9	9.3	9.4	9.8	4.0	11.2	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	191	831	532	226	519	535	477	688	657	466	1190	
V/C Ratio(X)	0.28	1.07	0.42	0.68	0.76	0.76	0.46	0.29	0.30	0.20	0.36	
Avail Cap(c_a), veh/h	227	831	532	290	543	560	477	688	657	548	1190	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	45.5	30.4	32.3	39.1	39.1	20.7	25.1	25.5	22.0	28.8	0.0
Incr Delay (d2), s/veh	0.8	52.2	0.5	3.9	5.4	5.3	0.7	1.1	1.2	0.2	0.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	26.2	8.6	6.0	16.2	16.6	6.7	7.3	7.3	2.9	8.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	33.9	97.7	31.0	36.2	44.5	44.4	21.4	26.2	26.7	22.2	29.7	0.0
LnGrp LOS	C	F	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1169			954			618			519	
Approach Delay, s/veh		81.9			43.1			24.7			28.3	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	48.2	17.8	36.0	13.3	52.9	12.4	41.4
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	14.0	28.0	12.0	36.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	11.8	13.7	9.7	31.5	6.5	11.9	5.3	26.3
Green Ext Time (p_c), s	0.0	1.7	0.2	0.0	0.1	1.4	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	51.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	1058	582	0	2	8
Future Volume (vph)	7	1058	582	0	2	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3225	0	1906	1705
Flt Permitted	0.372				0.950	
Satd. Flow (perm)	654	3274	3225	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						10
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	9	1339	737	0	3	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1339	737	0	3	10
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	57.0	57.0	57.0		33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%		36.7%	36.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	1058	582	0	2	8
Future Volume (veh/h)	7	1058	582	0	2	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	9	1339	737	0	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	712	3070	2938	0	29	25
Arrive On Green	0.88	0.88	1.00	0.00	0.01	0.00
Sat Flow, veh/h	722	3600	3533	0	2115	1882
Grp Volume(v), veh/h	9	1339	737	0	3	0
Grp Sat Flow(s),veh/h/ln	722	1754	1678	0	2115	1882
Q Serve(g_s), s	0.1	6.9	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.1	6.9	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	712	3070	2938	0	29	25
V/C Ratio(X)	0.01	0.44	0.25	0.00	0.10	0.00
Avail Cap(c_a), veh/h	712	3070	2938	0	658	586
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	1.1	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.2	0.0	1.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.3	0.2	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.6	0.2	0.0	45.4	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		1348	737		3	
Approach Delay, s/veh		1.6	0.2		45.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	83.8			83.8	6.2
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	51.0			51.0	27.0
Max Q Clear Time (g_c+I1), s	2.0			8.9	2.1
Green Ext Time (p_c), s	24.7			37.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	1.2
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1094	2	1	580	3	1
Future Volume (vph)	1094	2	1	580	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1302	2	1	690	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1304	0	0	691	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1094	2	1	580	3	1
Future Vol, veh/h	1094	2	1	580	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1302	2	1	690	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1304	0	1650	652
Stage 1	-	-	-	-	1303	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	659	-	*209	*896
Stage 1	-	-	-	-	*429	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	659	-	*209	*896
Mov Cap-2 Maneuver	-	-	-	-	*209	-
Stage 1	-	-	-	-	*429	-
Stage 2	-	-	-	-	*1032	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	259	-	-	659	-
HCM Lane V/C Ratio	0.018	-	-	0.002	-
HCM Control Delay (s/veh)	19.2	-	-	10.5	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	869	0	0	525	58	373	0	182	0	0	0
Future Volume (vph)	18	869	0	0	525	58	373	0	182	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.985				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5734	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5734	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					31				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	22	1060	0	0	640	71	455	0	222	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	22	1060	0	0	711	0	227	228	222	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		23.0	23.0	23.0			
Total Split (%)	14.4%				37.8%		25.6%	25.6%	25.6%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	8.0	62.0			29.0		18.0	18.0	18.0			
Actuated g/C Ratio	0.09	0.69			0.32		0.20	0.20	0.20			
v/c Ratio	0.15	0.47			0.38		0.71	0.71	0.50			
Control Delay (s/veh)	34.6	4.7			18.6		47.8	48.0	12.3			
Queue Delay	0.0	0.3			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	34.6	5.0			18.6		47.8	48.0	12.3			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		5.7			18.7			36.3				

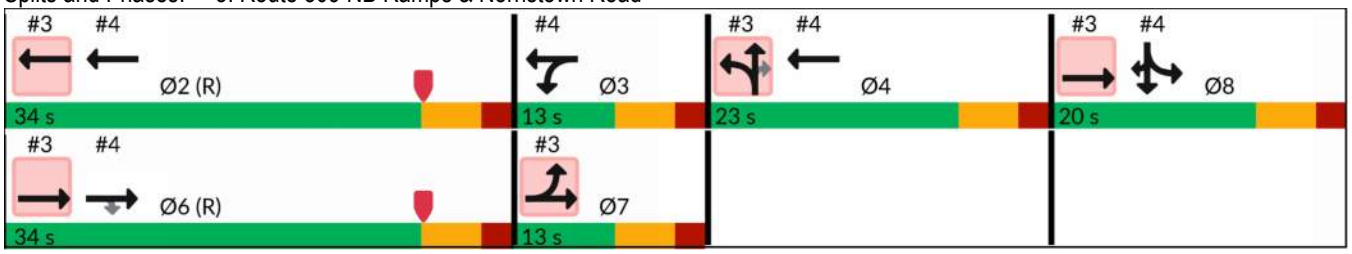
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	20.0
Total Split (%)	14%	38%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	13	50			84		128	128	19			
Queue Length 95th (ft)	33	54			47		189	190	64			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2221			1868		317	317	441			
Starvation Cap Reductn	0	564			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.15	0.64			0.38		0.72	0.72	0.50			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 17.8 Intersection LOS: B
Intersection Capacity Utilization 103.0% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	499	864	157	843	0	0	0	0	25	2	7
Future Volume (vph)	0	499	864	157	843	0	0	0	0	25	2	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.956	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Flt Permitted				0.950							0.956	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			901									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	525	909	165	887	0	0	0	0	26	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	525	909	165	887	0	0	0	0	0	28	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						20.0	20.0	20.0
Total Split (%)		37.8%	37.8%	14.4%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		29.0	29.0	8.0	65.0						15.0	15.0
Actuated g/C Ratio		0.32	0.32	0.09	0.72						0.17	0.17
v/c Ratio		0.34	0.85	0.58	0.37						0.09	0.01
Control Delay (s/veh)		21.8	20.3	51.7	2.0						32.9	0.0
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay (s/veh)		21.8	20.3	51.7	2.3						32.9	0.0
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		20.9			10.1						26.3	

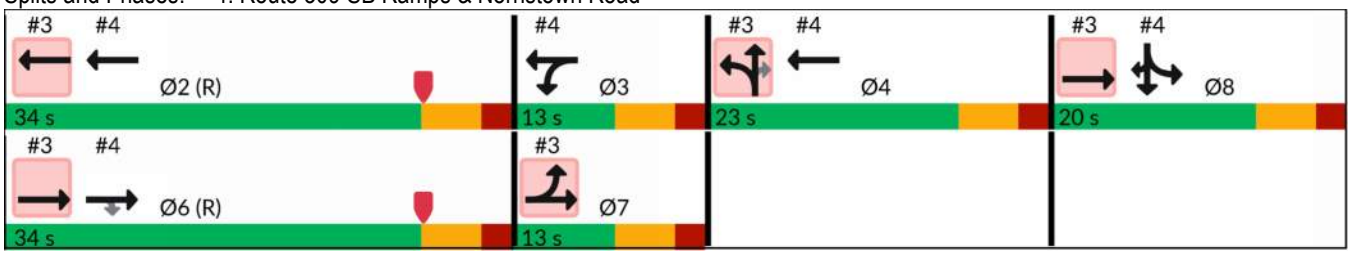
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	23.0	13.0
Total Split (%)	38%	26%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			B						C	
Queue Length 50th (ft)		94	304	53	10						14	0
Queue Length 95th (ft)		120	#516	m81	32						38	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1508	1064	280	2352						282	437
Starvation Cap Reductn		0	0	0	799						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.35	0.85	0.59	0.57						0.10	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 16.4 Intersection LOS: B
Intersection Capacity Utilization 103.0% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

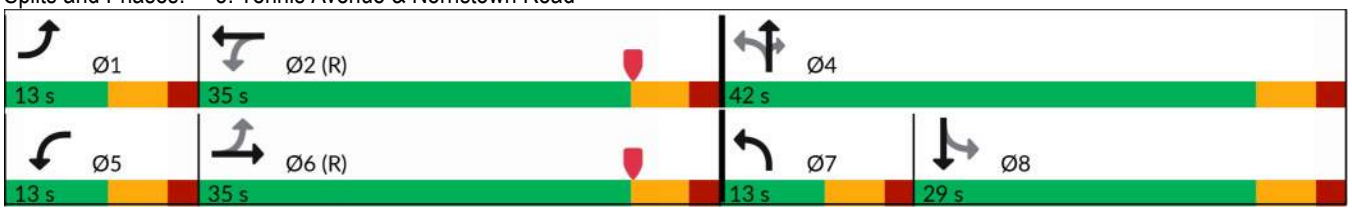
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	500	385	74	373	13	59	152	85	8	122	140
Future Volume (vph)	209	500	385	74	373	13	59	152	85	8	122	140
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935			0.995				0.850		0.930	
Flt Protected	0.950			0.950				0.986			0.999	
Satd. Flow (prot)	1652	3119	0	1693	1736	0	0	1672	1493	0	1571	0
Flt Permitted	0.325			0.221				0.697			0.988	
Satd. Flow (perm)	565	3119	0	394	1736	0	0	1182	1493	0	1554	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		59	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	235	562	433	83	419	15	66	171	96	9	137	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	235	995	0	83	434	0	0	237	96	0	303	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	35.0		13.0	35.0		13.0	42.0	42.0	29.0	29.0	
Total Split (%)	14.4%	38.9%		14.4%	38.9%		14.4%	46.7%	46.7%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	55.2	45.1		47.4	39.0			23.8	23.8		23.8	
Actuated g/C Ratio	0.61	0.50		0.53	0.43			0.26	0.26		0.26	
v/c Ratio	0.47	0.63		0.25	0.57			0.75	0.20		0.66	
Control Delay (s/veh)	8.0	13.0		11.0	25.5			45.0	4.4		29.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	8.0	13.0		11.0	25.5			45.0	4.4		29.9	
LOS	A	B		B	C			D	A		C	
Approach Delay (s/veh)		12.1			23.2			33.4			29.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	20	124		17	184			124	0		123	
Queue Length 95th (ft)	60	#401		44	325			179	25		180	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	493	1561		336	753			485	677		498	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.48	0.64		0.25	0.58			0.49	0.14		0.61	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 19.8 Intersection LOS: B
Intersection Capacity Utilization 78.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

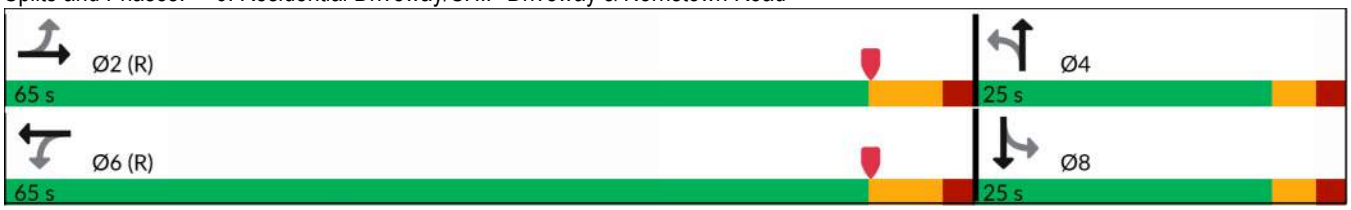
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1233	15	15	853	3	13	0	39	50	0	44
Future Volume (vph)	6	1233	15	15	853	3	13	0	39	50	0	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.850			0.850	
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1668	1492	0
Flt Permitted		0.950			0.914		0.725			0.729		
Satd. Flow (perm)	0	3192	0	0	3142	0	1298	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			1			67			163	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	7	1370	17	17	948	3	14	0	43	56	0	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1394	0	0	968	0	14	43	0	56	49	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	65.0	65.0		65.0	65.0		25.0	25.0		25.0	25.0	
Total Split (%)	72.2%	72.2%		72.2%	72.2%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1233	15	15	853	3	13	0	39	50	0	44
Future Volume (veh/h)	6	1233	15	15	853	3	13	0	39	50	0	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	7	1370	15	17	948	3	14	0	21	56	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	44	2690	29	62	2808	9	176	0	128	174	0	128
Arrive On Green	1.00	1.00	1.00	0.79	0.80	0.79	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	4	3344	36	25	3490	11	1336	0	1521	1314	0	1521
Grp Volume(v), veh/h	729	0	663	495	0	473	14	0	21	56	0	20
Grp Sat Flow(s),veh/h/ln	1771	0	1614	1802	0	1725	1336	0	1521	1314	0	1521
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	6.7	0.9	0.0	1.2	3.7	0.0	1.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.3	0.0	6.7	2.0	0.0	1.2	4.9	0.0	1.1
Prop In Lane	0.01		0.02	0.03		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1446	0	1298	1471	0	1387	176	0	128	174	0	128
V/C Ratio(X)	0.50	0.00	0.51	0.34	0.00	0.34	0.08	0.00	0.16	0.32	0.00	0.16
Avail Cap(c_a), veh/h	1446	0	1298	1471	0	1387	375	0	355	369	0	355
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.00	0.63	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	2.3	0.0	2.4	39.2	0.0	38.7	40.5	0.0	38.7
Incr Delay (d2), s/veh	0.8	0.0	0.9	0.6	0.0	0.7	0.2	0.0	0.6	1.1	0.0	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	0.6	2.4	0.0	2.1	0.5	0.0	0.8	2.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.8	0.0	0.9	3.0	0.0	3.0	39.3	0.0	39.3	41.6	0.0	39.2
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1392			968			35			76	
Approach Delay, s/veh		0.8			3.0			39.3			41.0	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.4	11.6	78.4	11.6
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	58.0	20.0	58.0	20.0
Max Q Clear Time (g_c+I1), s	0.0	4.0	0.0	6.9
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.5
HCM 6th LOS	A

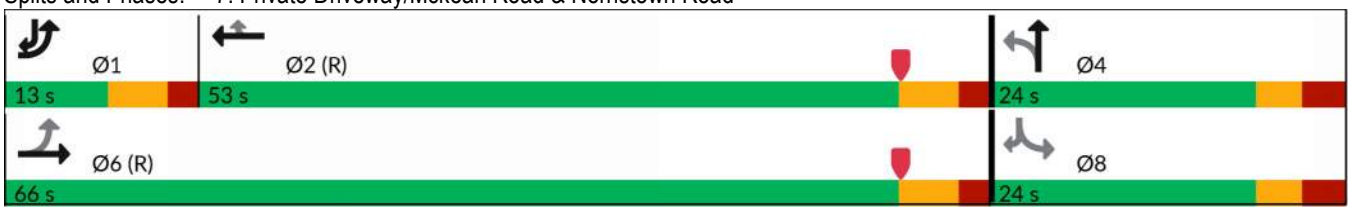
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	973	0	0	792	116	0	0	0	229	0	179
Future Volume (vph)	104	973	0	0	792	116	0	0	0	229	0	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	3356	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted		0.706								0.757		
Satd. Flow (perm)	0	2381	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						123						136
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	111	1035	0	0	843	123	0	0	0	244	0	190
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1146	0	0	843	123	0	0	0	244	0	190
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	66.0			53.0	53.0	24.0	24.0		24.0		13.0
Total Split (%)	14.4%	73.3%			58.9%	58.9%	26.7%	26.7%		26.7%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		61.3			49.5	49.5				18.7		30.5
Actuated g/C Ratio		0.68			0.55	0.55				0.21		0.34
v/c Ratio		0.67			0.45	0.13				0.91		0.31
Control Delay (s/veh)		10.1			8.9	2.8				72.9		8.7
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		10.1			8.9	2.8				72.9		8.7
LOS		B			A	A				E		A
Approach Delay (s/veh)		10.1			8.2						44.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		146			121	10				136		21
Queue Length 95th (ft)		189			126	21				#275		68
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1693			1873	901				272		616
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.68			0.45	0.14				0.90		0.31

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay (s/veh): 15.3 Intersection LOS: B
Intersection Capacity Utilization 79.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road

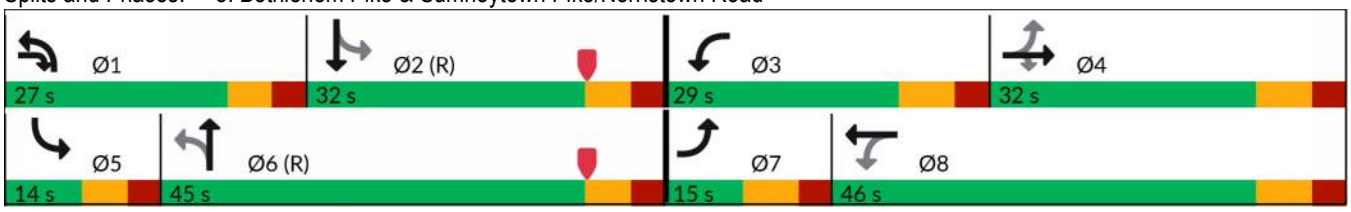


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	764	195	202	726	80	225	479	184	155	422	42
Future Volume (vph)	60	764	195	202	726	80	225	479	184	155	422	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.985			0.958			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3255	0	1604	3183	0	1604	3135	0
Flt Permitted	0.241			0.108			0.260			0.308		
Satd. Flow (perm)	413	3290	1603	192	3255	0	439	3183	0	520	3135	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					50			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	63	804	205	213	764	84	237	504	194	163	444	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	804	205	213	848	0	237	698	0	163	488	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	32.0	27.0	29.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	26.7%	22.5%	24.2%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	764	195	202	726	80	225	479	184	155	422	42
Future Volume (veh/h)	60	764	195	202	726	80	225	479	184	155	422	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	63	804	153	213	764	84	237	504	157	163	444	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	184	722	515	278	909	100	502	1060	328	368	1196	
Arrive On Green	0.05	0.21	0.21	0.12	0.27	0.27	0.11	0.39	0.38	0.07	0.35	0.00
Sat Flow, veh/h	1723	3464	1604	1856	3314	364	1807	2710	839	1750	3555	0
Grp Volume(v), veh/h	63	804	153	213	420	428	237	334	327	163	444	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1604	1856	1825	1854	1807	1803	1746	1750	1732	0
Q Serve(g_s), s	3.4	25.0	8.6	10.2	26.1	26.1	9.5	16.6	16.9	7.2	11.6	0.0
Cycle Q Clear(g_c), s	3.4	25.0	8.6	10.2	26.1	26.1	9.5	16.6	16.9	7.2	11.6	0.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.48	1.00		0.00
Lane Grp Cap(c), veh/h	184	722	515	278	500	508	502	705	683	368	1196	
V/C Ratio(X)	0.34	1.11	0.30	0.77	0.84	0.84	0.47	0.47	0.48	0.44	0.37	
Avail Cap(c_a), veh/h	211	722	515	400	593	603	615	705	683	368	1196	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.7	47.5	30.6	32.1	41.1	41.2	20.1	27.3	27.6	23.5	29.5	0.0
Incr Delay (d2), s/veh	1.1	69.4	0.3	4.9	8.4	8.3	0.7	2.3	2.4	0.8	0.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	25.9	5.9	8.2	18.0	18.2	7.1	11.9	11.7	5.4	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	36.8	116.9	30.9	37.1	49.5	49.5	20.8	29.6	30.0	24.4	30.4	0.0
LnGrp LOS	D	F	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1020			1061			898			607	
Approach Delay, s/veh		99.0			47.0			27.4			28.8	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.5	47.4	21.1	32.0	14.0	52.9	13.2	39.9
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	21.0	24.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	12.0	14.1	12.7	27.5	9.7	19.1	5.9	28.6
Green Ext Time (p_c), s	0.5	1.4	0.4	0.0	0.0	2.3	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	53.8
HCM 6th LOS	D

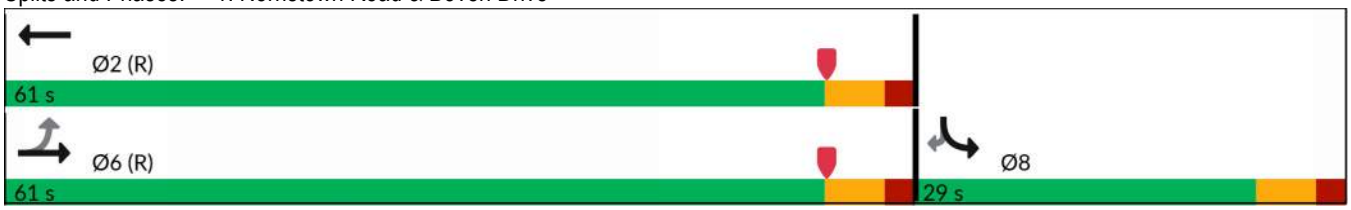
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	565	561	1	2	1
Future Volume (vph)	2	565	561	1	2	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3289	0	1906	1705
Flt Permitted	0.428				0.950	
Satd. Flow (perm)	752	3306	3289	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	595	591	1	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	595	592	0	2	1
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	61.0	61.0	61.0		29.0	29.0
Total Split (%)	67.8%	67.8%	67.8%		32.2%	32.2%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	565	561	1	2	1
Future Volume (veh/h)	2	565	561	1	2	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	2	595	591	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	804	3097	3060	5	27	24
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.00
Sat Flow, veh/h	827	3628	3582	6	2115	1882
Grp Volume(v), veh/h	2	595	288	304	2	0
Grp Sat Flow(s),veh/h/ln	827	1767	1705	1793	2115	1882
Q Serve(g_s), s	0.0	2.3	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.0	2.3	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	804	3097	1494	1571	27	24
V/C Ratio(X)	0.00	0.19	0.19	0.19	0.07	0.00
Avail Cap(c_a), veh/h	804	3097	1494	1571	564	502
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.3	1.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.2	0.2	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.0	0.3	0.3	45.1	0.0
LnGrp LOS	A	A	A	A	D	
Approach Vol, veh/h		597	592		2	
Approach Delay, s/veh		1.0	0.3		45.1	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	83.9				83.9	6.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	55.0				55.0	23.0
Max Q Clear Time (g_c+I1), s	2.0				4.3	2.1
Green Ext Time (p_c), s	18.9				19.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.7
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	575	2	1	563	1	2
Future Volume (vph)	575	2	1	563	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	605	2	1	593	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	607	0	0	594	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	575	2	1	563	1	2
Future Vol, veh/h	575	2	1	563	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	605	2	1	593	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	607	0	905	304
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	299	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1083	-	*867	*1076
Stage 1	-	-	-	-	*838	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1083	-	*866	*1076
Mov Cap-2 Maneuver	-	-	-	-	*866	-
Stage 1	-	-	-	-	*838	-
Stage 2	-	-	-	-	*1033	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	996	-	-	1083	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.6	-	-	8.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	427	0	0	506	38	342	0	171	0	0	0
Future Volume (vph)	5	427	0	0	506	38	342	0	171	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.989				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5890	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5890	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					19				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	5	445	0	0	527	40	356	0	178	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	5	445	0	0	567	0	178	178	178	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		20.0	20.0	20.0			
Total Split (%)	14.4%				37.8%		22.2%	22.2%	22.2%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.6	64.6			31.5		15.4	15.4	15.4			
Actuated g/C Ratio	0.08	0.72			0.35		0.17	0.17	0.17			
v/c Ratio	0.03	0.19			0.27		0.64	0.64	0.43			
Control Delay (s/veh)	29.2	1.1			24.5		47.0	47.0	8.7			
Queue Delay	0.0	0.2			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	29.2	1.3			24.5		47.0	47.0	8.7			
LOS	C	A			C		D	D	A			
Approach Delay (s/veh)		1.6			24.5			34.3				

Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	23.0
Total Split (%)	14%	38%	26%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

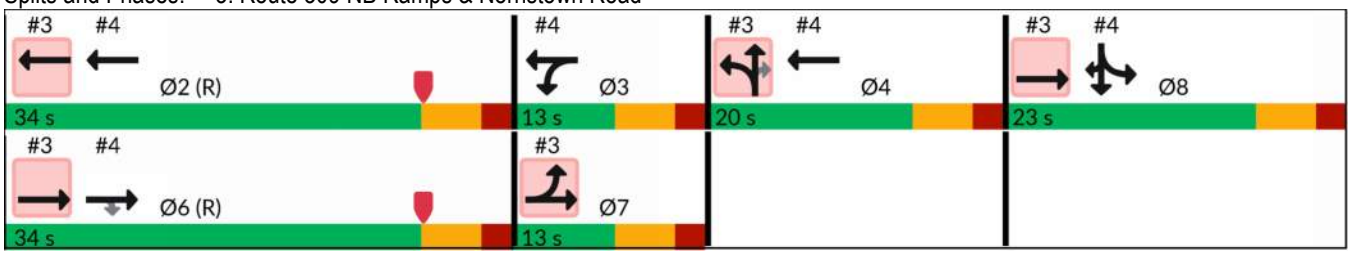
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			C				
Queue Length 50th (ft)	3	1			72		101	101	0			
Queue Length 95th (ft)	m12	14			88		#189	#189	53			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2262			2075		276	276	411			
Starvation Cap Reductn	0	1053			0		0	0	0			
Spillback Cap Reductn	0	0			35		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.37			0.28		0.64	0.64	0.43			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 21.2 Intersection LOS: C
Intersection Capacity Utilization 69.2% ICU Level of Service C
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	370	358	90	812	0	0	0	0	40	0	11
Future Volume (vph)	0	370	358	90	812	0	0	0	0	40	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			385									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	398	385	97	873	0	0	0	0	43	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	398	385	97	873	0	0	0	0	0	43	12
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						23.0	23.0	23.0
Total Split (%)		37.8%	37.8%	14.4%						25.6%	25.6%	25.6%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		31.5	31.5	7.6	64.5						15.5	15.5
Actuated g/C Ratio		0.35	0.35	0.08	0.72						0.17	0.17
v/c Ratio		0.24	0.51	0.36	0.37						0.14	0.02
Control Delay (s/veh)		20.2	7.9	48.0	2.7						32.7	0.0
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay (s/veh)		20.2	7.9	48.0	3.0						32.7	0.0
LOS		C	A	D	A						C	A
Approach Delay (s/veh)		14.2			7.6						25.6	

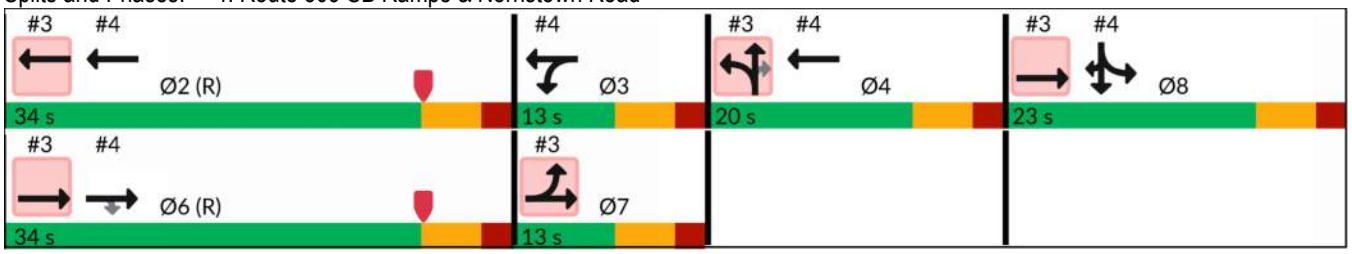
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	20.0	13.0
Total Split (%)	38%	22%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		57	0	30	11						21	0
Queue Length 95th (ft)		85	130	m53	41						49	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1607	743	280	2254						338	489
Starvation Cap Reductn		0	0	0	791						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.25	0.52	0.35	0.60						0.13	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 11.0 Intersection LOS: B
Intersection Capacity Utilization 69.2% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

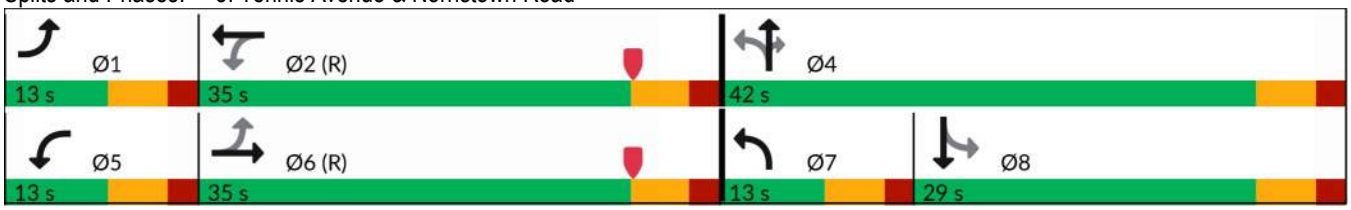
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	417	37	54	389	5	53	83	59	8	83	103
Future Volume (vph)	127	417	37	54	389	5	53	83	59	8	83	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.998				0.850		0.928	
Flt Protected	0.950			0.950				0.981			0.998	
Satd. Flow (prot)	1701	3331	0	1710	1796	0	0	1696	1553	0	1580	0
Flt Permitted	0.431			0.479				0.587			0.985	
Satd. Flow (perm)	772	3331	0	862	1796	0	0	1015	1553	0	1560	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		62	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	134	439	39	57	409	5	56	87	62	8	87	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	134	478	0	57	414	0	0	143	62	0	203	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	35.0		13.0	35.0		13.0	42.0	42.0	29.0	29.0	
Total Split (%)	14.4%	38.9%		14.4%	38.9%		14.4%	46.7%	46.7%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	61.9	54.4		58.2	50.8			15.4	15.4		15.4	
Actuated g/C Ratio	0.69	0.60		0.65	0.56			0.17	0.17		0.17	
v/c Ratio	0.21	0.23		0.09	0.40			0.82	0.17		0.63	
Control Delay (s/veh)	2.9	3.8		5.3	14.0			69.8	2.5		32.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	2.9	3.8		5.3	14.0			69.8	2.5		32.4	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		3.6			13.0			49.5			32.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	6	18		8	123			79	0		74	
Queue Length 95th (ft)	24	35		23	238			137	9		135	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	625	2014		641	1013			417	702		461	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.21	0.24		0.09	0.41			0.34	0.09		0.44	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 16.8 Intersection LOS: B
Intersection Capacity Utilization 65.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Tennis Avenue & Norristown Road

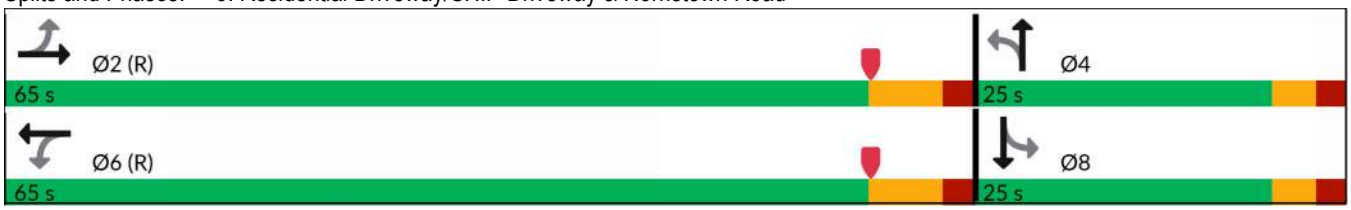


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	727	15	20	731	0	8	0	14	7	0	0
Future Volume (vph)	0	727	15	20	731	0	8	0	14	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99							
Frt		0.997						0.850				
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1701	1791	0
Flt Permitted					0.924							
Satd. Flow (perm)	0	3360	0	0	3177	0	1791	1522	0	1791	1791	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5						242				
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	757	16	21	761	0	8	0	15	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	773	0	0	782	0	8	15	0	7	0	0
Turn Type		NA		Perm	NA		Perm	NA		Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	65.0	65.0		65.0	65.0		25.0	25.0		25.0	25.0	
Total Split (%)	72.2%	72.2%		72.2%	72.2%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	727	15	20	731	0	8	0	14	7	0	0
Future Volume (veh/h)	0	727	15	20	731	0	8	0	14	7	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	0	757	16	21	761	0	8	0	4	7	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	0	2931	62	87	2940	0	112	0	36	109	43	0
Arrive On Green	0.00	0.87	0.85	0.85	0.87	0.00	0.02	0.00	0.01	0.02	0.00	0.00
Sat Flow, veh/h	0	3476	72	52	3485	0	1360	0	1521	1355	1794	0
Grp Volume(v), veh/h	0	378	395	411	371	0	8	0	4	7	0	0
Grp Sat Flow(s),veh/h/ln	0	1691	1767	1810	1640	0	1360	0	1521	1355	1794	0
Q Serve(g_s), s	0.0	3.5	3.5	0.0	3.5	0.0	0.5	0.0	0.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.5	3.5	3.4	3.5	0.0	0.5	0.0	0.2	0.7	0.0	0.0
Prop In Lane	0.00		0.04	0.05		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1463	1529	1588	1419	0	112	0	36	109	43	0
V/C Ratio(X)	0.00	0.26	0.26	0.26	0.26	0.00	0.07	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	0	1463	1529	1588	1419	0	397	0	355	393	419	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.1	1.1	1.1	1.1	0.0	43.1	0.0	43.5	43.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	0.4	0.4	0.0	0.3	0.0	1.3	0.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.3	0.3	0.4	0.3	0.0	0.3	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	1.5	1.4	1.4	1.5	0.0	43.4	0.0	44.8	43.6	0.0	0.0
LnGrp LOS		A	A	A	A		D		D	D		
Approach Vol, veh/h		773			782			12			7	
Approach Delay, s/veh		1.4			1.5			43.9			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	58.0	20.0	58.0	20.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.0
HCM 6th LOS	A

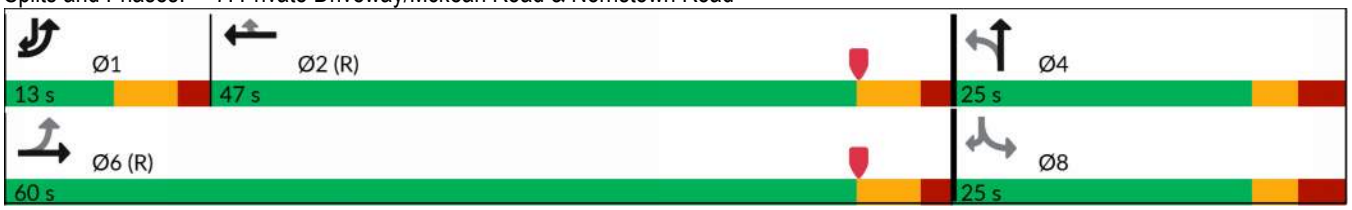
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	529	0	0	526	69	0	0	0	90	0	110
Future Volume (vph)	101	529	0	0	526	69	0	0	0	90	0	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3348	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted		0.764								0.757		
Satd. Flow (perm)	0	2578	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						120
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	110	575	0	0	572	75	0	0	0	98	0	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	685	0	0	572	75	0	0	0	98	0	120
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	60.0			47.0	47.0	25.0	25.0		25.0		13.0
Total Split (%)	15.3%	70.6%			55.3%	55.3%	29.4%	29.4%		29.4%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		65.8			56.5	56.5				12.8		21.8
Actuated g/C Ratio		0.77			0.66	0.66				0.15		0.26
v/c Ratio		0.33			0.25	0.07				0.50		0.25
Control Delay (s/veh)		4.4			8.6	0.9				41.2		5.4
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		4.4			8.6	0.9				41.2		5.4
LOS		A			A	A				D		A
Approach Delay (s/veh)		4.5			7.7						21.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						C	
Queue Length 50th (ft)		52			71	0				49		0
Queue Length 95th (ft)		94			117	8				91		34
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		2043			2240	1061				303		496
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.34			0.26	0.07				0.32		0.24

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay (s/veh): 8.2 Intersection LOS: A
Intersection Capacity Utilization 50.8% ICU Level of Service A
Analysis Period (min) 15

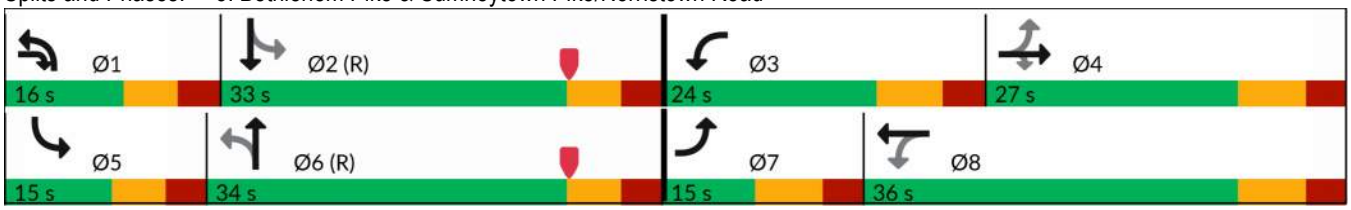
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	401	175	118	411	95	165	435	110	156	432	64
Future Volume (vph)	57	401	175	118	411	95	165	435	110	156	432	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.972			0.970			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3251	0	1558	3229	0	1604	3147	0
Flt Permitted	0.402			0.318			0.344			0.325		
Satd. Flow (perm)	670	3290	1624	564	3251	0	564	3229	0	549	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			218					31			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	61	431	188	127	442	102	177	468	118	168	465	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	431	188	127	544	0	177	586	0	168	534	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	15.0	27.0	16.0	24.0	36.0		16.0	34.0		15.0	33.0	
Total Split (%)	15.0%	27.0%	16.0%	24.0%	36.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	401	175	118	411	95	165	435	110	156	432	64
Future Volume (veh/h)	57	401	175	118	411	95	165	435	110	156	432	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	61	431	147	127	442	98	177	468	104	168	465	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	214	570	412	284	597	131	511	1165	257	462	1375	
Arrive On Green	0.05	0.16	0.16	0.09	0.20	0.19	0.09	0.40	0.39	0.09	0.39	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2995	659	1767	2935	648	1750	3583	0
Grp Volume(v), veh/h	61	431	147	127	270	270	177	286	286	168	465	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1816	1767	1803	1781	1750	1745	0
Q Serve(g_s), s	2.9	11.9	7.5	5.5	13.8	14.0	5.7	11.4	11.6	5.5	9.3	0.0
Cycle Q Clear(g_c), s	2.9	11.9	7.5	5.5	13.8	14.0	5.7	11.4	11.6	5.5	9.3	0.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.36	1.00		0.00
Lane Grp Cap(c), veh/h	214	570	412	284	367	362	511	716	707	462	1375	
V/C Ratio(X)	0.28	0.76	0.36	0.45	0.74	0.75	0.35	0.40	0.40	0.36	0.34	
Avail Cap(c_a), veh/h	257	693	469	433	533	527	525	716	707	463	1375	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	39.9	30.4	30.7	37.6	37.8	15.2	21.6	21.8	15.5	21.2	0.0
Incr Delay (d2), s/veh	0.7	3.9	0.5	1.1	3.0	3.3	0.4	1.7	1.7	0.5	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	9.0	5.1	4.4	10.3	10.4	4.0	8.5	8.6	3.8	6.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.9	43.7	30.9	31.8	40.5	41.1	15.6	23.3	23.5	16.0	21.8	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	B	C	
Approach Vol, veh/h		639			667			749			633	
Approach Delay, s/veh		39.7			39.1			21.6			20.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	45.4	15.9	23.5	14.9	45.7	12.5	26.9
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	16.0	19.0	8.0	27.0	7.0	28.0
Max Q Clear Time (g_c+I1), s	8.2	11.8	8.0	14.4	8.0	13.9	5.4	16.3
Green Ext Time (p_c), s	0.0	1.6	0.2	1.1	0.0	1.7	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	29.9
HCM 6th LOS	C

Notes

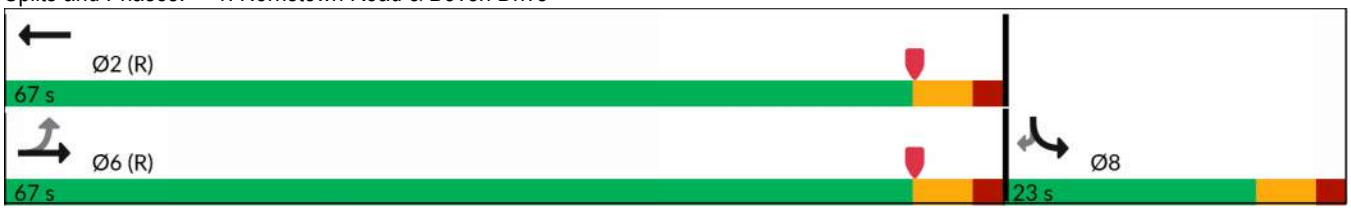
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2027 Base Conditions

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	716	645	8	1	2
Future Volume (vph)	8	716	645	8	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3214	0	1906	1137
Flt Permitted	0.393				0.950	
Satd. Flow (perm)	691	3211	3214	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			2
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	8	746	672	8	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	746	680	0	1	2
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	67.0	67.0	67.0		23.0	23.0
Total Split (%)	74.4%	74.4%	74.4%		25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	716	645	8	1	2
Future Volume (veh/h)	8	716	645	8	1	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	8	746	672	8	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	747	3026	2976	35	27	16
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.01
Sat Flow, veh/h	762	3544	3485	40	2115	1255
Grp Volume(v), veh/h	8	746	332	348	1	1
Grp Sat Flow(s),veh/h/ln	762	1727	1678	1759	2115	1255
Q Serve(g_s), s	0.1	3.1	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.1	3.1	0.0	0.0	0.0	0.1
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	747	3026	1470	1541	27	16
V/C Ratio(X)	0.01	0.25	0.23	0.23	0.04	0.06
Avail Cap(c_a), veh/h	747	3026	1470	1541	423	251
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.7	0.9	0.0	0.0	43.9	43.9
Incr Delay (d2), s/veh	0.0	0.2	0.4	0.3	0.6	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.3	0.3	0.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.1	0.4	0.3	44.4	45.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		754	680		2	
Approach Delay, s/veh		1.1	0.3		45.0	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	83.9				83.9	6.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	61.0				61.0	17.0
Max Q Clear Time (g_c+I1), s	2.0				5.1	2.1
Green Ext Time (p_c), s	23.6				26.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	723	1	0	657	3	2
Future Volume (vph)	723	1	0	657	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	761	1	0	692	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	762	0	0	692	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	723	1	0	657	3	2
Future Vol, veh/h	723	1	0	657	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	761	1	0	692	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	762	0	1108	381
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	346	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	993	-	*772	*1025
Stage 1	-	-	-	-	*753	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	993	-	*772	*1025
Mov Cap-2 Maneuver	-	-	-	-	*772	-
Stage 1	-	-	-	-	*753	-
Stage 2	-	-	-	-	*994	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	857	-	-	993	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	479	0	0	623	25	756	0	250	0	0	0
Future Volume (vph)	4	479	0	0	623	25	756	0	250	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.994				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5799	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5799	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					8				234			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	4	489	0	0	636	26	771	0	255	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	4	489	0	0	662	0	385	386	255	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	14.0				21.0		28.0	28.0	28.0			
Total Split (%)	15.6%				23.3%		31.1%	31.1%	31.1%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	8.7	56.7			20.2		23.3	23.3	23.3			
Actuated g/C Ratio	0.10	0.63			0.22		0.26	0.26	0.26			
v/c Ratio	0.03	0.25			0.50		0.92	0.93	0.44			
Control Delay (s/veh)	17.5	1.8			23.1		64.1	64.5	7.8			
Queue Delay	0.0	0.2			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	17.5	2.1			23.1		64.1	64.5	7.8			

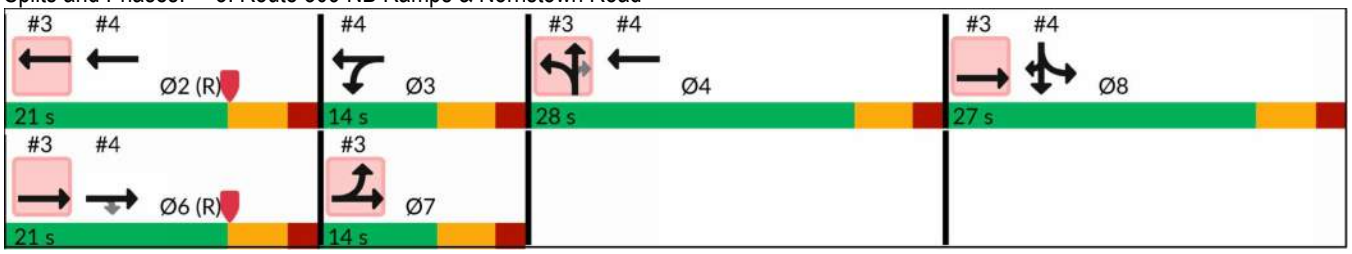
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	14.0	21.0	27.0
Total Split (%)	16%	23%	30%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		E	E	A			
Approach Delay (s/veh)		2.3			23.2			50.3				
Approach LOS		A			C			D				
Queue Length 50th (ft)	2	14			85		226	226	9			
Queue Length 95th (ft)	m6	37			108		#409	#410	69			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	131	1922			1310		415	415	568			
Starvation Cap Reductn	0	772			0		0	0	0			
Spillback Cap Reductn	0	0			33		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.43			0.52		0.93	0.93	0.45			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay (s/veh): 31.2 Intersection LOS: C
Intersection Capacity Utilization 92.2% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	452	530	169	1206	0	0	0	0	45	0	23
Future Volume (vph)	0	452	530	169	1206	0	0	0	0	45	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1694
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			535									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	457	535	171	1218	0	0	0	0	45	0	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	457	535	171	1218	0	0	0	0	0	45	23
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		21.0	21.0	14.0						27.0	27.0	27.0
Total Split (%)		23.3%	23.3%	15.6%						30.0%	30.0%	30.0%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		20.2	20.2	8.7	62.2						17.8	17.8
Actuated g/C Ratio		0.22	0.22	0.10	0.69						0.20	0.20
v/c Ratio		0.45	0.74	0.56	0.55						0.14	0.04
Control Delay (s/veh)		30.6	14.0	48.3	3.4						30.1	0.1
Queue Delay		0.0	0.0	0.0	2.1						0.0	0.0
Total Delay (s/veh)		30.6	14.0	48.3	5.6						30.1	0.1

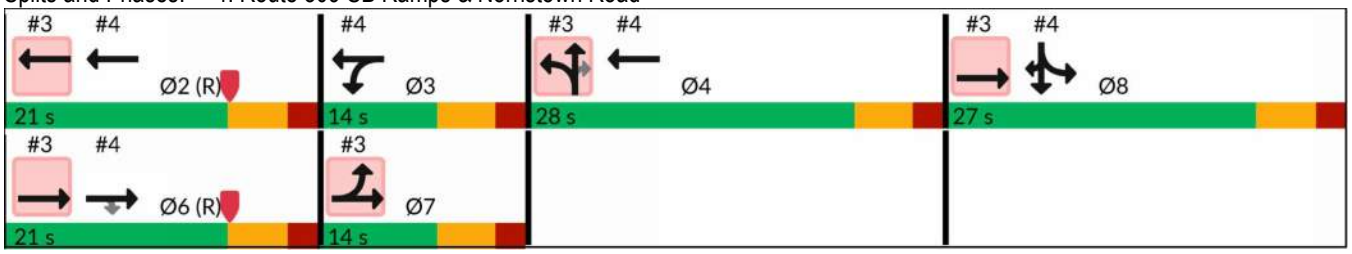
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	21.0	28.0	14.0
Total Split (%)	23%	31%	16%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	B	D	A						C	A
Approach Delay (s/veh)		21.7			10.9						20.0	
Approach LOS		C			B						B	
Queue Length 50th (ft)		80	0	55	24						22	0
Queue Length 95th (ft)		121	#243	m72	m39						48	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1012	722	315	2184						384	557
Starvation Cap Reductn		0	0	0	786						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.45	0.74	0.54	0.87						0.12	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay (s/veh): 15.5 Intersection LOS: B
Intersection Capacity Utilization 92.2% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

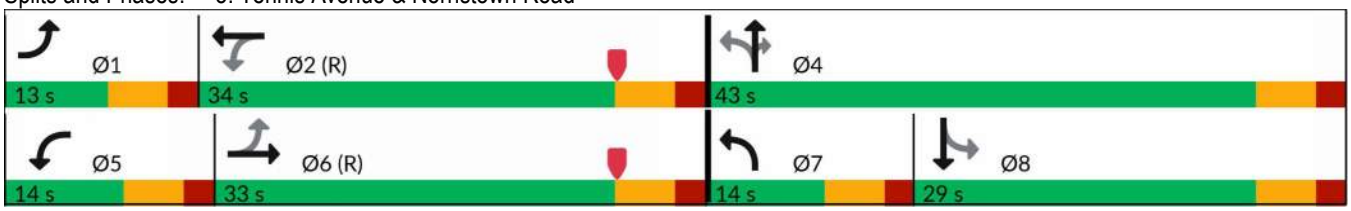
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	466	39	104	398	4	47	94	88	3	167	195
Future Volume (vph)	216	466	39	104	398	4	47	94	88	3	167	195
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.989			0.999				0.850		0.928	
Flt Protected	0.950			0.950				0.984				
Satd. Flow (prot)	1652	3227	0	1613	1759	0	0	1660	1465	0	1535	0
Flt Permitted	0.289			0.442				0.681			0.998	
Satd. Flow (perm)	503	3227	0	750	1759	0	0	1149	1465	0	1532	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		63	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	235	507	42	113	433	4	51	102	96	3	182	212
Shared Lane Traffic (%)												
Lane Group Flow (vph)	235	549	0	113	437	0	0	153	96	0	397	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	33.0		14.0	34.0		14.0	43.0	43.0	29.0	29.0	
Total Split (%)	14.4%	36.7%		15.6%	37.8%		15.6%	47.8%	47.8%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	51.1	40.5		44.4	35.0			27.5	27.5		27.5	
Actuated g/C Ratio	0.57	0.45		0.49	0.39			0.31	0.31		0.31	
v/c Ratio	0.52	0.37		0.24	0.63			0.43	0.18		0.77	
Control Delay (s/veh)	18.9	9.7		11.7	29.7			27.8	4.0		34.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	18.9	9.7		11.7	29.7			27.8	4.0		34.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A		B	C			C	A		C	
Approach Delay (s/veh)		12.5			26.1			18.7			34.2	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	27	51		27	207			68	0		171	
Queue Length 95th (ft)	126	85		62	#365			112	25		251	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	445	1450		471	683			485	681		527	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.53	0.38		0.24	0.64			0.32	0.14		0.75	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay (s/veh): 21.4 Intersection LOS: C
Intersection Capacity Utilization 81.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

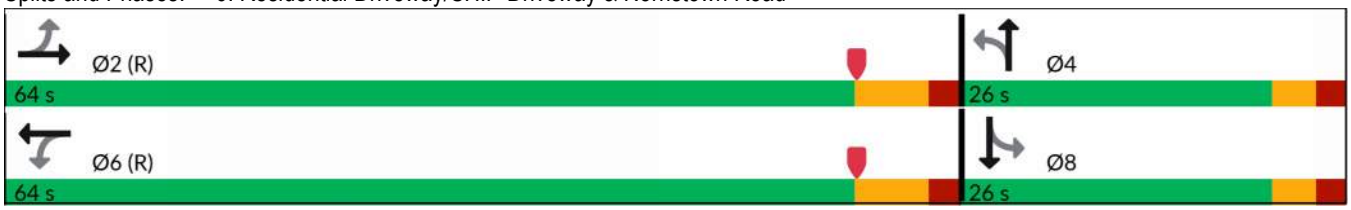
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	968	21	17	1146	10	7	0	10	7	0	5
Future Volume (vph)	27	968	21	17	1146	10	7	0	10	7	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.999			0.850			0.850	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3262	0	0	3363	0	1701	1269	0	1492	1522	0
Flt Permitted		0.893			0.931							
Satd. Flow (perm)	0	2916	0	0	3134	0	1791	1269	0	1571	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			142			96	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	28	998	22	18	1181	10	7	0	10	7	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1048	0	0	1209	0	7	10	0	7	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	968	21	17	1146	10	7	0	10	7	0	5
Future Volume (veh/h)	27	968	21	17	1146	10	7	0	10	7	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	28	998	21	18	1181	10	7	0	3	7	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	83	2647	55	59	2999	25	111	0	35	106	0	35
Arrive On Green	0.85	0.87	0.85	0.85	0.87	0.85	0.02	0.00	0.01	0.02	0.00	0.01
Sat Flow, veh/h	47	3058	64	21	3465	29	1359	0	1521	1208	0	1521
Grp Volume(v), veh/h	529	0	518	626	0	583	7	0	3	7	0	1
Grp Sat Flow(s),veh/h/ln	1598	0	1570	1819	0	1696	1359	0	1521	1208	0	1521
Q Serve(g_s), s	0.0	0.0	6.0	0.0	0.0	6.3	0.5	0.0	0.2	0.5	0.0	0.1
Cycle Q Clear(g_c), s	5.3	0.0	6.0	6.1	0.0	6.3	0.5	0.0	0.2	0.7	0.0	0.1
Prop In Lane	0.05		0.04	0.03		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1408	0	1359	1596	0	1468	111	0	35	106	0	35
V/C Ratio(X)	0.38	0.00	0.38	0.39	0.00	0.40	0.06	0.00	0.09	0.07	0.00	0.03
Avail Cap(c_a), veh/h	1408	0	1359	1596	0	1468	411	0	372	373	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.00	0.61	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.2	0.0	1.2	1.2	0.0	1.2	43.2	0.0	43.5	43.4	0.0	43.5
Incr Delay (d2), s/veh	0.5	0.0	0.5	0.7	0.0	0.8	0.2	0.0	1.0	0.3	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.0	0.3	0.7	0.0	0.6	0.3	0.0	0.1	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	1.6	0.0	1.7	2.0	0.0	2.0	43.5	0.0	44.5	43.6	0.0	43.8
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1047			1209			10			8	
Approach Delay, s/veh		1.7			2.0			43.8			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.2
HCM 6th LOS	A

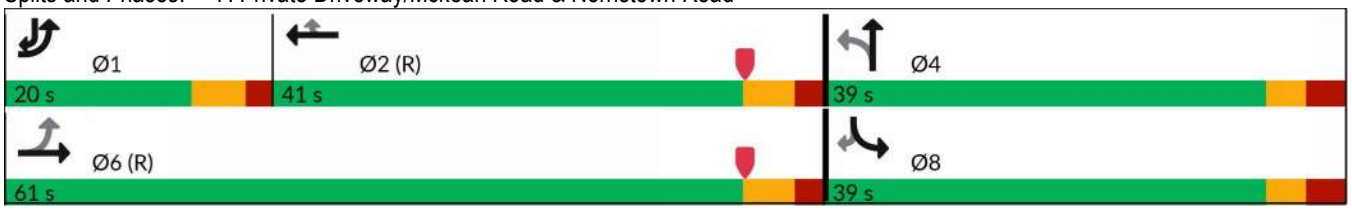
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	831	0	0	806	208	0	0	0	153	0	113
Future Volume (vph)	172	831	0	0	806	208	0	0	0	153	0	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3315	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted		0.587								0.950		
Satd. Flow (perm)	0	1962	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						234						37
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	193	934	0	0	906	234	0	0	0	172	0	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1127	0	0	906	234	0	0	0	172	0	127
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	61.0			41.0	41.0	39.0	39.0		39.0		20.0
Total Split (%)	20.0%	61.0%			41.0%	41.0%	39.0%	39.0%		39.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		72.9			61.1	61.1				17.1		28.9
Actuated g/C Ratio		0.73			0.61	0.61				0.17		0.29
v/c Ratio		0.74			0.44	0.22				0.62		0.28
Control Delay (s/veh)		11.2			11.9	2.0				48.0		19.6
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		11.2			11.9	2.0				48.0		19.6
LOS		B			B	A				D		B
Approach Delay (s/veh)		11.3			9.9						36.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		132			148	0				103		43
Queue Length 95th (ft)		213			227	32				158		81
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1522			2059	1020				545		568
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.74			0.44	0.23				0.32		0.22

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay (s/veh): 13.5 Intersection LOS: B
Intersection Capacity Utilization 73.7% ICU Level of Service D
Analysis Period (min) 15
! Phase conflict between lane groups.

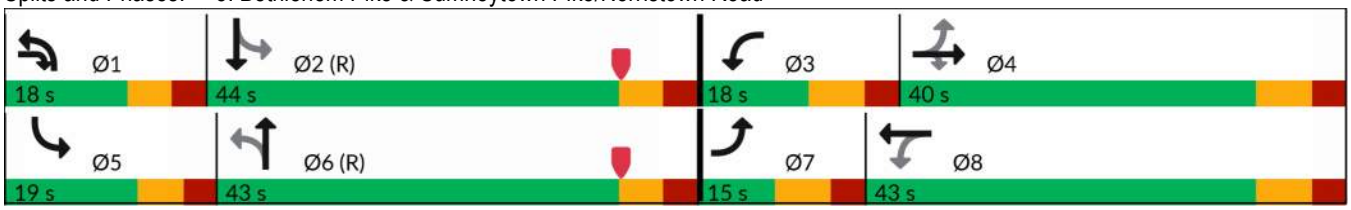
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	831	287	142	703	44	205	266	155	87	396	57
Future Volume (vph)	49	831	287	142	703	44	205	266	155	87	396	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.991			0.945			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3246	0	1528	3060	0	1588	3033	0
Flt Permitted	0.212			0.103			0.358			0.423		
Satd. Flow (perm)	350	3257	1562	181	3246	0	576	3060	0	707	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			192					102			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	53	894	309	153	756	47	220	286	167	94	426	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	894	309	153	803	0	220	453	0	94	487	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	40.0	18.0	18.0	43.0		18.0	43.0		19.0	44.0	
Total Split (%)	12.5%	33.3%	15.0%	15.0%	35.8%		15.0%	35.8%		15.8%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	831	287	142	703	44	205	266	155	87	396	57
Future Volume (veh/h)	49	831	287	142	703	44	205	266	155	87	396	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	53	894	227	153	756	47	220	286	115	94	426	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	214	945	584	230	1098	68	445	888	349	434	1089	
Arrive On Green	0.04	0.28	0.28	0.09	0.32	0.31	0.10	0.36	0.35	0.06	0.32	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3463	215	1739	2472	971	1736	3472	0
Grp Volume(v), veh/h	53	894	227	153	395	408	220	202	199	94	426	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1868	1739	1762	1680	1736	1691	0
Q Serve(g_s), s	2.7	30.6	12.8	6.9	22.9	22.9	9.9	10.0	10.4	4.2	11.7	0.0
Cycle Q Clear(g_c), s	2.7	30.6	12.8	6.9	22.9	22.9	9.9	10.0	10.4	4.2	11.7	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	214	945	584	230	574	592	445	633	604	434	1089	
V/C Ratio(X)	0.25	0.95	0.39	0.67	0.69	0.69	0.49	0.32	0.33	0.22	0.39	
Avail Cap(c_a), veh/h	252	945	584	239	574	592	445	633	604	513	1089	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.2	42.6	27.4	30.9	35.8	35.9	23.2	27.8	28.2	24.2	31.6	0.0
Incr Delay (d2), s/veh	0.6	17.7	0.4	6.0	3.1	3.1	0.9	1.3	1.5	0.2	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	21.4	8.2	6.0	15.2	15.6	7.3	7.8	7.8	3.1	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.8	60.3	27.9	36.9	38.9	38.9	24.0	29.1	29.6	24.4	32.6	0.0
LnGrp LOS	C	E	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1174			956			621			520	
Approach Delay, s/veh		52.7			38.6			27.5			31.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	44.6	17.4	40.0	13.5	49.1	12.3	45.1
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	10.0	32.0	12.0	36.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	12.4	14.2	9.4	33.1	6.7	12.5	5.2	25.4
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.1	1.4	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	40.4
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	1063	585	0	2	8
Future Volume (vph)	7	1063	585	0	2	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3225	0	1906	1705
Flt Permitted	0.370				0.950	
Satd. Flow (perm)	650	3274	3225	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						10
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	9	1346	741	0	3	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1346	741	0	3	10
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	55.0	55.0	55.0		35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%		38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	1063	585	0	2	8
Future Volume (veh/h)	7	1063	585	0	2	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	9	1346	741	0	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	710	3070	2938	0	29	25
Arrive On Green	0.88	0.88	1.00	0.00	0.01	0.00
Sat Flow, veh/h	720	3600	3533	0	2115	1882
Grp Volume(v), veh/h	9	1346	741	0	3	0
Grp Sat Flow(s),veh/h/ln	720	1754	1678	0	2115	1882
Q Serve(g_s), s	0.1	7.0	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.1	7.0	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	710	3070	2938	0	29	25
V/C Ratio(X)	0.01	0.44	0.25	0.00	0.10	0.00
Avail Cap(c_a), veh/h	710	3070	2938	0	705	627
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	1.1	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.2	0.0	1.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.4	0.2	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.6	0.2	0.0	45.4	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		1355	741		3	
Approach Delay, s/veh		1.6	0.2		45.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	83.8			83.8	6.2
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	49.0			49.0	29.0
Max Q Clear Time (g_c+I1), s	2.0			9.0	2.1
Green Ext Time (p_c), s	24.3			35.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	1.2
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1100	2	1	583	3	1
Future Volume (vph)	1100	2	1	583	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1310	2	1	694	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1312	0	0	695	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1100	2	1	583	3	1
Future Vol, veh/h	1100	2	1	583	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1310	2	1	694	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1312	0	1660	656
Stage 1	-	-	-	-	1311	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	653	-	*203	*896
Stage 1	-	-	-	-	*424	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	653	-	*203	*896
Mov Cap-2 Maneuver	-	-	-	-	*203	-
Stage 1	-	-	-	-	*424	-
Stage 2	-	-	-	-	*1032	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	19.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	252	-	-	653	-
HCM Lane V/C Ratio	0.019	-	-	0.002	-
HCM Control Delay (s/veh)	19.6	-	-	10.5	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	873	0	0	528	58	375	0	183	0	0	0
Future Volume (vph)	18	873	0	0	528	58	375	0	183	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.985				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5735	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5735	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					31				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	22	1065	0	0	644	71	457	0	223	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	22	1065	0	0	715	0	228	229	223	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	14.0				34.0		22.0	22.0	22.0			
Total Split (%)	15.6%				37.8%		24.4%	24.4%	24.4%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	9.0	63.0			29.0		17.0	17.0	17.0			
Actuated g/C Ratio	0.10	0.70			0.32		0.19	0.19	0.19			
v/c Ratio	0.13	0.47			0.38		0.76	0.76	0.52			
Control Delay (s/veh)	33.6	4.5			18.6		52.7	53.0	13.1			
Queue Delay	0.0	0.3			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	33.6	4.9			18.6		52.7	53.0	13.1			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		5.5			18.7			39.9				

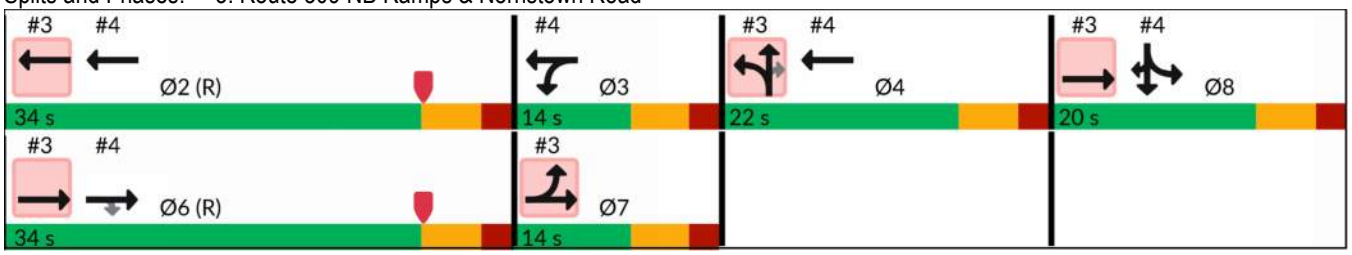
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	14.0	34.0	20.0
Total Split (%)	16%	38%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	13	47			85		130	131	20			
Queue Length 95th (ft)	33	52			49		#209	#210	66			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	164	2257			1868		299	299	426			
Starvation Cap Reductn	0	594			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.13	0.64			0.38		0.76	0.77	0.52			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 18.7 Intersection LOS: B
Intersection Capacity Utilization 103.4% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	502	868	158	847	0	0	0	0	25	2	7
Future Volume (vph)	0	502	868	158	847	0	0	0	0	25	2	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.956	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Flt Permitted				0.950							0.956	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			881									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	528	914	166	892	0	0	0	0	26	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	528	914	166	892	0	0	0	0	0	28	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	14.0						20.0	20.0	20.0
Total Split (%)		37.8%	37.8%	15.6%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		29.0	29.0	9.0	65.0						15.0	15.0
Actuated g/C Ratio		0.32	0.32	0.10	0.72						0.17	0.17
v/c Ratio		0.35	0.87	0.52	0.37						0.09	0.01
Control Delay (s/veh)		21.7	21.8	49.0	2.2						32.9	0.0
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay (s/veh)		21.7	21.8	49.0	2.5						32.9	0.0
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		21.8			9.8						26.3	

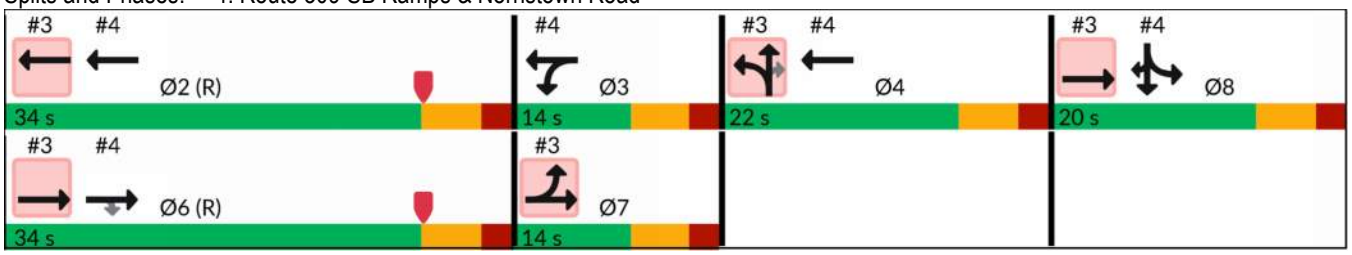
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	22.0	14.0
Total Split (%)	38%	24%	16%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A						C	
Queue Length 50th (ft)		95	316	53	10						14	0
Queue Length 95th (ft)		119	#544	m79	33						38	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1508	1050	315	2352						282	437
Starvation Cap Reductn		0	0	0	821						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.35	0.87	0.53	0.58						0.10	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 16.9 Intersection LOS: B
Intersection Capacity Utilization 103.4% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

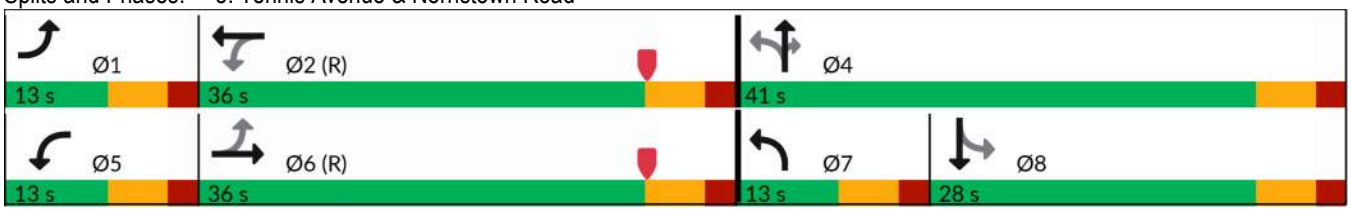
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	503	387	74	375	13	59	153	85	8	123	141
Future Volume (vph)	210	503	387	74	375	13	59	153	85	8	123	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935			0.995				0.850		0.930	
Flt Protected	0.950			0.950				0.986			0.999	
Satd. Flow (prot)	1652	3119	0	1693	1736	0	0	1672	1493	0	1571	0
Flt Permitted	0.324			0.214				0.707			0.989	
Satd. Flow (perm)	563	3119	0	381	1736	0	0	1199	1493	0	1555	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		58	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	236	565	435	83	421	15	66	172	96	9	138	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	1000	0	83	436	0	0	238	96	0	305	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	54.3	44.5		47.3	38.9			24.4	24.4		24.4	
Actuated g/C Ratio	0.60	0.49		0.53	0.43			0.27	0.27		0.27	
v/c Ratio	0.49	0.64		0.25	0.58			0.73	0.19		0.65	
Control Delay (s/veh)	8.6	13.7		11.4	25.5			42.3	4.3		29.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	8.6	13.7		11.4	25.5			42.3	4.3		29.2	
LOS	A	B		B	C			D	A		C	
Approach Delay (s/veh)		12.8			23.3			31.4			29.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	21	126		17	187			122	0		124	
Queue Length 95th (ft)	67	#410		45	320			177	25		179	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	480	1543		329	751			479	662		498	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.49	0.65		0.25	0.58			0.50	0.15		0.61	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay (s/veh): 19.8 Intersection LOS: B
Intersection Capacity Utilization 79.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

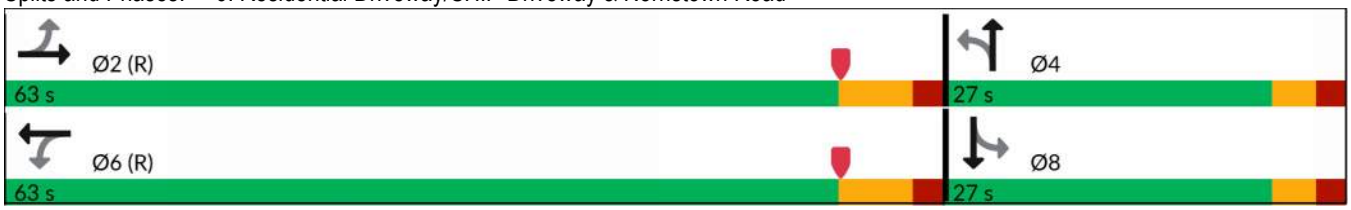
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1239	15	15	857	3	13	0	39	50	0	44
Future Volume (vph)	6	1239	15	15	857	3	13	0	39	50	0	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.850			0.850	
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1668	1492	0
Flt Permitted		0.950			0.914		0.725			0.729		
Satd. Flow (perm)	0	3192	0	0	3142	0	1298	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			1			59			151	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	7	1377	17	17	952	3	14	0	43	56	0	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1401	0	0	972	0	14	43	0	56	49	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1239	15	15	857	3	13	0	39	50	0	44
Future Volume (veh/h)	6	1239	15	15	857	3	13	0	39	50	0	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	7	1377	15	17	952	3	14	0	21	56	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	44	2690	29	62	2807	9	177	0	129	174	0	129
Arrive On Green	1.00	1.00	1.00	0.79	0.80	0.79	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	4	3344	36	25	3490	11	1336	0	1521	1314	0	1521
Grp Volume(v), veh/h	732	0	667	497	0	475	14	0	21	56	0	20
Grp Sat Flow(s),veh/h/ln	1771	0	1614	1802	0	1725	1336	0	1521	1314	0	1521
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	6.7	0.9	0.0	1.2	3.7	0.0	1.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.3	0.0	6.7	2.0	0.0	1.2	4.9	0.0	1.1
Prop In Lane	0.01		0.02	0.03		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1445	0	1298	1470	0	1387	177	0	129	174	0	129
V/C Ratio(X)	0.51	0.00	0.51	0.34	0.00	0.34	0.08	0.00	0.16	0.32	0.00	0.16
Avail Cap(c_a), veh/h	1445	0	1298	1470	0	1387	405	0	389	399	0	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.00	0.62	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	2.3	0.0	2.4	39.1	0.0	38.7	40.5	0.0	38.7
Incr Delay (d2), s/veh	0.8	0.0	0.9	0.6	0.0	0.7	0.2	0.0	0.6	1.1	0.0	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	0.6	2.4	0.0	2.0	0.5	0.0	0.8	2.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.8	0.0	0.9	3.0	0.0	3.1	39.3	0.0	39.3	41.6	0.0	39.2
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1399			972			35			76	
Approach Delay, s/veh		0.8			3.0			39.3			41.0	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.4	11.6	78.4	11.6
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	56.0	22.0	56.0	22.0
Max Q Clear Time (g_c+I1), s	0.0	4.0	0.0	6.9
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.5
HCM 6th LOS	A

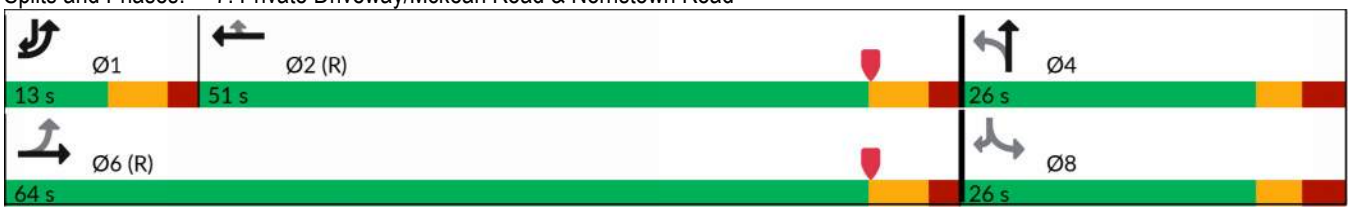
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	976	0	0	795	116	0	0	0	230	0	180
Future Volume (vph)	104	976	0	0	795	116	0	0	0	230	0	180
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	3356	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted		0.700								0.757		
Satd. Flow (perm)	0	2361	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						123						122
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	111	1038	0	0	846	123	0	0	0	245	0	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1149	0	0	846	123	0	0	0	245	0	191
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	64.0			51.0	51.0	26.0	26.0		26.0		13.0
Total Split (%)	14.4%	71.1%			56.7%	56.7%	28.9%	28.9%		28.9%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		60.0			48.2	48.2				20.0		31.8
Actuated g/C Ratio		0.67			0.54	0.54				0.22		0.35
v/c Ratio		0.69			0.46	0.13				0.85		0.31
Control Delay (s/veh)		11.4			9.3	2.9				61.2		9.4
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		11.4			9.3	2.9				61.2		9.4
LOS		B			A	A				E		A
Approach Delay (s/veh)		11.4			8.5						38.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		160			121	10				132		26
Queue Length 95th (ft)		207			127	20				#259		73
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1648			1824	881				301		627
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.70			0.46	0.14				0.81		0.30

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 15.0 Intersection LOS: B
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road

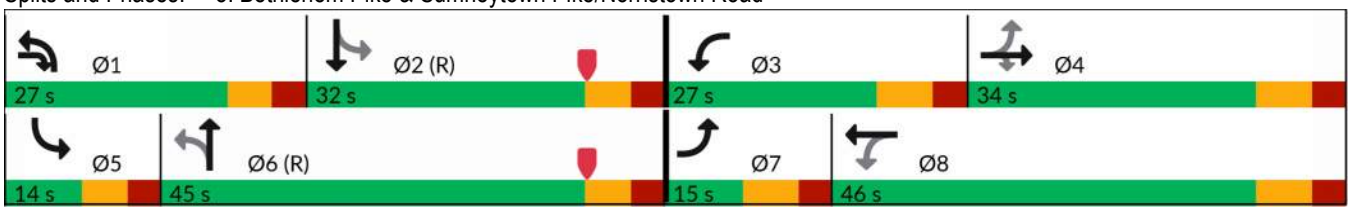


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	767	196	203	728	80	226	481	185	156	423	42
Future Volume (vph)	60	767	196	203	728	80	226	481	185	156	423	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.985			0.958			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3255	0	1604	3183	0	1604	3138	0
Flt Permitted	0.238			0.109			0.258			0.306		
Satd. Flow (perm)	408	3290	1603	193	3255	0	436	3183	0	517	3138	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					50			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	63	807	206	214	766	84	238	506	195	164	445	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	807	206	214	850	0	238	701	0	164	489	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	34.0	27.0	27.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	28.3%	22.5%	22.5%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	767	196	203	728	80	226	481	185	156	423	42
Future Volume (veh/h)	60	767	196	203	728	80	226	481	185	156	423	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	63	807	154	214	766	84	238	506	158	164	445	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	195	779	545	274	960	105	487	1019	317	354	1138	
Arrive On Green	0.05	0.22	0.22	0.12	0.29	0.28	0.11	0.38	0.37	0.07	0.33	0.00
Sat Flow, veh/h	1723	3464	1605	1856	3316	363	1807	2708	841	1750	3555	0
Grp Volume(v), veh/h	63	807	154	214	421	429	238	336	328	164	445	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1605	1856	1825	1854	1807	1803	1746	1750	1732	0
Q Serve(g_s), s	3.3	27.0	8.4	10.0	25.6	25.6	9.8	17.1	17.4	7.5	11.9	0.0
Cycle Q Clear(g_c), s	3.3	27.0	8.4	10.0	25.6	25.6	9.8	17.1	17.4	7.5	11.9	0.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.48	1.00		0.00
Lane Grp Cap(c), veh/h	195	779	545	274	528	537	487	679	657	354	1138	
V/C Ratio(X)	0.32	1.04	0.28	0.78	0.80	0.80	0.49	0.50	0.50	0.46	0.39	
Avail Cap(c_a), veh/h	223	779	545	369	593	603	596	679	657	354	1138	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.1	46.5	28.9	31.3	39.4	39.5	21.1	28.7	28.9	24.9	31.1	0.0
Incr Delay (d2), s/veh	0.9	41.7	0.3	6.7	6.2	6.1	0.8	2.6	2.7	0.9	1.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	22.9	5.7	8.2	17.3	17.6	7.4	12.2	12.1	5.6	8.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.1	88.2	29.2	38.0	45.6	45.6	21.9	31.2	31.6	25.9	32.1	0.0
LnGrp LOS	D	F	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1024			1064			902			609	
Approach Delay, s/veh		76.1			44.1			28.9			30.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.8	45.4	20.8	34.0	14.0	51.2	13.1	41.7
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	19.0	26.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	12.3	14.4	12.5	29.5	10.0	19.6	5.8	28.1
Green Ext Time (p_c), s	0.5	1.3	0.4	0.0	0.0	2.3	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	47.1
HCM 6th LOS	D

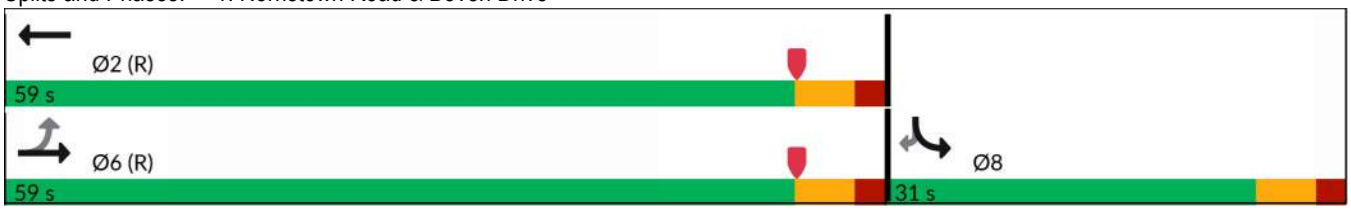
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	568	564	1	2	1
Future Volume (vph)	2	568	564	1	2	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3289	0	1906	1705
Flt Permitted	0.427				0.950	
Satd. Flow (perm)	750	3306	3289	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	598	594	1	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	598	595	0	2	1
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	59.0	59.0	59.0		31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%		34.4%	34.4%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	568	564	1	2	1
Future Volume (veh/h)	2	568	564	1	2	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	2	598	594	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	802	3097	3060	5	27	24
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.00
Sat Flow, veh/h	824	3628	3582	6	2115	1882
Grp Volume(v), veh/h	2	598	290	305	2	0
Grp Sat Flow(s),veh/h/ln	824	1767	1705	1793	2115	1882
Q Serve(g_s), s	0.0	2.3	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.0	2.3	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	802	3097	1494	1571	27	24
V/C Ratio(X)	0.00	0.19	0.19	0.19	0.07	0.00
Avail Cap(c_a), veh/h	802	3097	1494	1571	611	544
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.3	1.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.2	0.2	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.0	0.3	0.3	45.1	0.0
LnGrp LOS	A	A	A	A	D	
Approach Vol, veh/h		600	595		2	
Approach Delay, s/veh		1.0	0.3		45.1	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	83.9				83.9	6.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	53.0				53.0	25.0
Max Q Clear Time (g_c+I1), s	2.0				4.3	2.1
Green Ext Time (p_c), s	18.8				19.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.7
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	578	2	1	566	1	2
Future Volume (vph)	578	2	1	566	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	608	2	1	596	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	610	0	0	597	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	578	2	1	566	1	2
Future Vol, veh/h	578	2	1	566	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	608	2	1	596	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	610	0	909	305
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1080	-	*858	*1076
Stage 1	-	-	-	-	*835	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1080	-	*857	*1076
Mov Cap-2 Maneuver	-	-	-	-	*857	-
Stage 1	-	-	-	-	*835	-
Stage 2	-	-	-	-	*1033	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	992	-	-	1080	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.6	-	-	8.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	429	0	0	509	38	344	0	172	0	0	0
Future Volume (vph)	5	429	0	0	509	38	344	0	172	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.989				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5890	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5890	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					19				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	5	447	0	0	530	40	358	0	179	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	5	447	0	0	570	0	179	179	179	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		18.0	18.0	18.0			
Total Split (%)	14.4%				37.8%		20.0%	20.0%	20.0%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.6	66.6			33.6		13.4	13.4	13.4			
Actuated g/C Ratio	0.08	0.74			0.37		0.15	0.15	0.15			
v/c Ratio	0.03	0.18			0.25		0.74	0.74	0.46			
Control Delay (s/veh)	31.0	1.0			22.8		57.3	57.3	9.8			
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	31.0	1.1			22.8		57.3	57.3	9.8			
LOS	C	A			C		E	E	A			
Approach Delay (s/veh)		1.5			22.9			41.5				

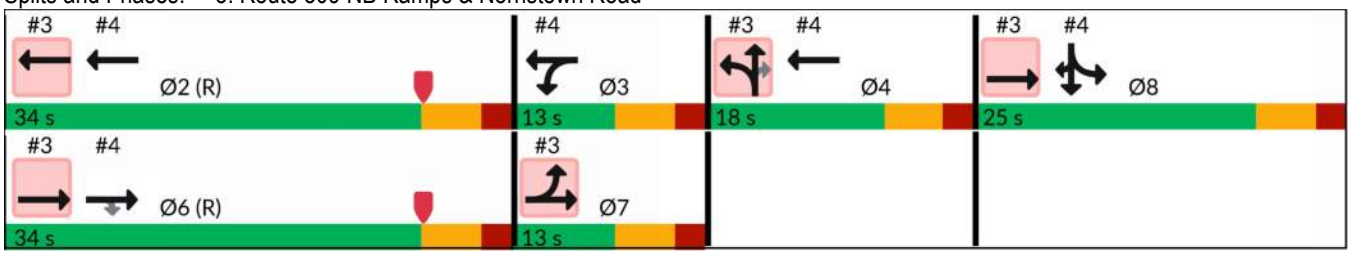
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	25.0
Total Split (%)	14%	38%	28%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			D				
Queue Length 50th (ft)	3	0			71		104	104	0			
Queue Length 95th (ft)	m13	12			88		#212	#212	55			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2411			2213		240	240	381			
Starvation Cap Reductn	0	1122			0		0	0	0			
Spillback Cap Reductn	0	0			38		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.35			0.26		0.75	0.75	0.47			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 23.1 Intersection LOS: C
Intersection Capacity Utilization 69.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	372	360	90	816	0	0	0	0	40	0	11
Future Volume (vph)	0	372	360	90	816	0	0	0	0	40	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			387									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	400	387	97	877	0	0	0	0	43	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	400	387	97	877	0	0	0	0	0	43	12
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						25.0	25.0	25.0
Total Split (%)		37.8%	37.8%	14.4%						27.8%	27.8%	27.8%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		33.6	33.6	7.6	64.6						15.4	15.4
Actuated g/C Ratio		0.37	0.37	0.08	0.72						0.17	0.17
v/c Ratio		0.23	0.50	0.36	0.37						0.14	0.02
Control Delay (s/veh)		18.6	7.3	48.9	3.1						33.0	0.0
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		18.6	7.3	48.9	3.6						33.0	0.0
LOS		B	A	D	A						C	A
Approach Delay (s/veh)		13.1			8.1						25.8	

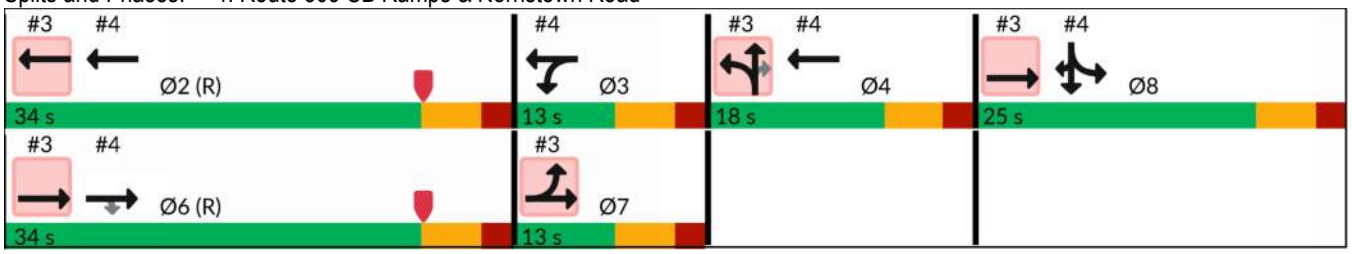
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	18.0	13.0
Total Split (%)	38%	20%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		56	0	30	13						21	0
Queue Length 95th (ft)		81	127	m51	46						50	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1715	768	280	2259						376	523
Starvation Cap Reductn		0	0	0	834						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.23	0.50	0.35	0.62						0.11	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 10.8 Intersection LOS: B
Intersection Capacity Utilization 69.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

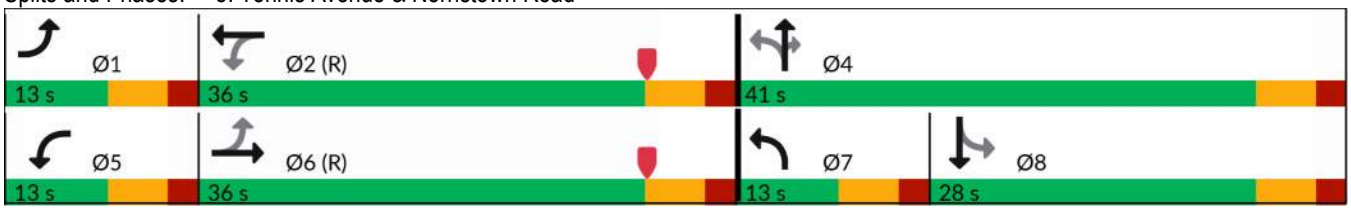
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	419	37	54	391	5	53	83	59	8	83	104
Future Volume (vph)	128	419	37	54	391	5	53	83	59	8	83	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.998				0.850		0.928	
Flt Protected	0.950			0.950				0.981			0.998	
Satd. Flow (prot)	1701	3331	0	1710	1796	0	0	1696	1553	0	1580	0
Flt Permitted	0.427			0.478				0.587			0.985	
Satd. Flow (perm)	765	3331	0	860	1796	0	0	1015	1553	0	1560	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		62	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	135	441	39	57	412	5	56	87	62	8	87	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	480	0	57	417	0	0	143	62	0	204	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	61.8	54.3		58.1	50.6			15.5	15.5		15.5	
Actuated g/C Ratio	0.69	0.60		0.65	0.56			0.17	0.17		0.17	
v/c Ratio	0.21	0.23		0.09	0.41			0.81	0.17		0.63	
Control Delay (s/veh)	3.0	3.9		5.3	14.1			68.4	2.4		32.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	3.0	3.9		5.3	14.1			68.4	2.4		32.3	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		3.7			13.1			48.5			32.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	6	18		8	125			79	0		75	
Queue Length 95th (ft)	24	36		23	240			137	9		137	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	621	2009		638	1009			406	686		444	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.22	0.24		0.09	0.41			0.35	0.09		0.46	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay (s/veh): 16.7 Intersection LOS: B
Intersection Capacity Utilization 65.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Tennis Avenue & Norristown Road

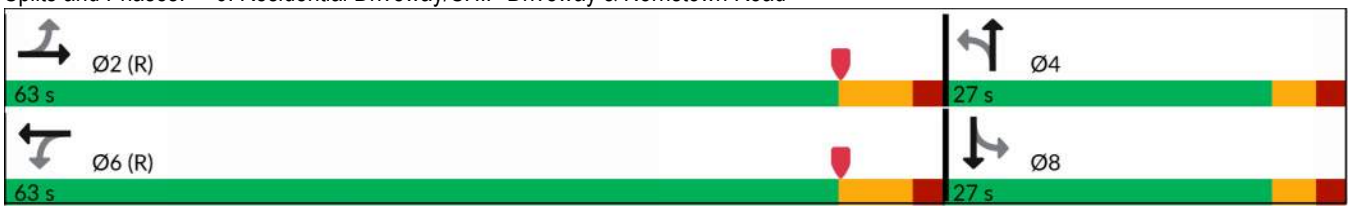


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	731	15	20	735	0	8	0	14	7	0	0
Future Volume (vph)	0	731	15	20	735	0	8	0	14	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99							
Frt		0.997						0.850				
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1701	1791	0
Flt Permitted					0.924							
Satd. Flow (perm)	0	3360	0	0	3177	0	1791	1522	0	1791	1791	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4						227				
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	761	16	21	766	0	8	0	15	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	777	0	0	787	0	8	15	0	7	0	0
Turn Type		NA		Perm	NA		Perm	NA		Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	731	15	20	735	0	8	0	14	7	0	0
Future Volume (veh/h)	0	731	15	20	735	0	8	0	14	7	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	0	761	16	21	766	0	8	0	4	7	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	0	2931	62	87	2941	0	112	0	36	109	43	0
Arrive On Green	0.00	0.87	0.85	0.85	0.87	0.00	0.02	0.00	0.01	0.02	0.00	0.00
Sat Flow, veh/h	0	3477	71	51	3486	0	1360	0	1521	1355	1794	0
Grp Volume(v), veh/h	0	380	397	413	374	0	8	0	4	7	0	0
Grp Sat Flow(s),veh/h/ln	0	1691	1768	1811	1640	0	1360	0	1521	1355	1794	0
Q Serve(g_s), s	0.0	3.5	3.5	0.0	3.6	0.0	0.5	0.0	0.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.5	3.5	3.4	3.6	0.0	0.5	0.0	0.2	0.7	0.0	0.0
Prop In Lane	0.00		0.04	0.05		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1463	1529	1588	1419	0	112	0	36	109	43	0
V/C Ratio(X)	0.00	0.26	0.26	0.26	0.26	0.00	0.07	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	0	1463	1529	1588	1419	0	428	0	389	423	459	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.1	1.1	1.1	1.1	0.0	43.1	0.0	43.5	43.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	0.4	0.5	0.0	0.3	0.0	1.3	0.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.3	0.3	0.4	0.3	0.0	0.3	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	1.5	1.4	1.5	1.5	0.0	43.4	0.0	44.8	43.6	0.0	0.0
LnGrp LOS		A	A	A	A		D		D	D		
Approach Vol, veh/h		777			787			12			7	
Approach Delay, s/veh		1.5			1.5			43.9			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	56.0	22.0	56.0	22.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.0
HCM 6th LOS	A

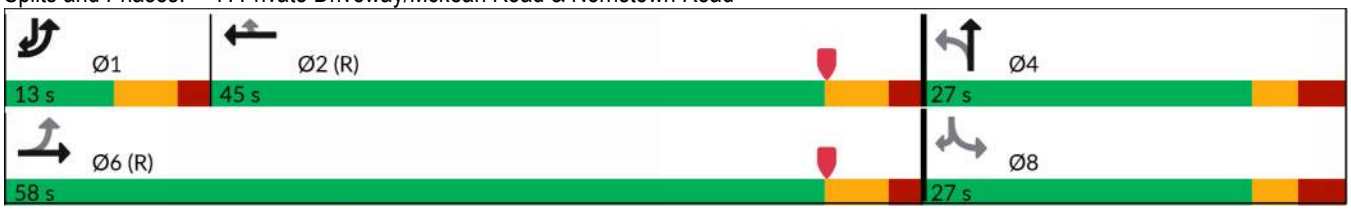
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	531	0	0	528	69	0	0	0	90	0	110
Future Volume (vph)	101	531	0	0	528	69	0	0	0	90	0	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3348	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted		0.764								0.757		
Satd. Flow (perm)	0	2578	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						120
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	110	577	0	0	574	75	0	0	0	98	0	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	687	0	0	574	75	0	0	0	98	0	120
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	58.0			45.0	45.0	27.0	27.0		27.0		13.0
Total Split (%)	15.3%	68.2%			52.9%	52.9%	31.8%	31.8%		31.8%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		65.8			56.5	56.5				12.8		21.8
Actuated g/C Ratio		0.77			0.66	0.66				0.15		0.26
v/c Ratio		0.33			0.25	0.07				0.50		0.25
Control Delay (s/veh)		4.5			8.6	0.9				41.2		5.4
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		4.5			8.6	0.9				41.2		5.4
LOS		A			A	A				D		A
Approach Delay (s/veh)		4.5			7.7						21.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						C	
Queue Length 50th (ft)		52			71	0				49		0
Queue Length 95th (ft)		95			118	8				91		34
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		2042			2239	1060				334		496
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.34			0.26	0.07				0.29		0.24

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay (s/veh): 8.2 Intersection LOS: A
Intersection Capacity Utilization 50.9% ICU Level of Service A
Analysis Period (min) 15

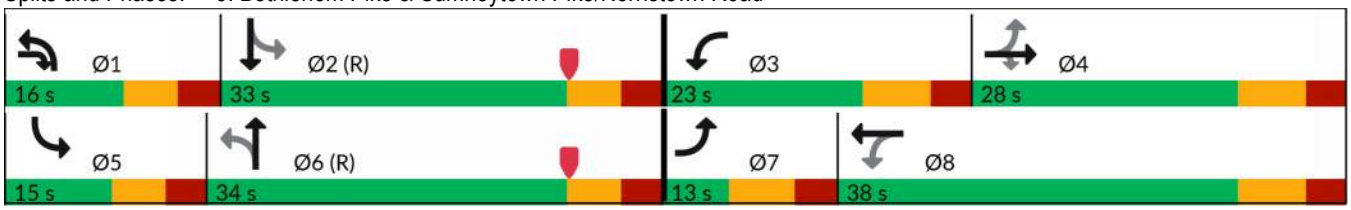
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	402	176	118	412	95	166	436	110	157	433	64
Future Volume (vph)	57	402	176	118	412	95	166	436	110	157	433	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.972			0.970			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3251	0	1558	3229	0	1604	3147	0
Flt Permitted	0.441			0.297			0.346			0.325		
Satd. Flow (perm)	734	3290	1624	527	3251	0	567	3229	0	549	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			218					31			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	61	432	189	127	443	102	178	469	118	169	466	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	432	189	127	545	0	178	587	0	169	535	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	13.0	28.0	16.0	23.0	38.0		16.0	34.0		15.0	33.0	
Total Split (%)	13.0%	28.0%	16.0%	23.0%	38.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	402	176	118	412	95	166	436	110	157	433	64
Future Volume (veh/h)	57	402	176	118	412	95	166	436	110	157	433	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	61	432	148	127	443	98	178	469	104	169	466	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	215	576	416	285	602	132	510	1160	256	460	1369	
Arrive On Green	0.05	0.17	0.17	0.09	0.20	0.19	0.09	0.39	0.38	0.09	0.39	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2996	658	1767	2937	647	1750	3583	0
Grp Volume(v), veh/h	61	432	148	127	270	271	178	287	286	169	466	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1816	1767	1803	1781	1750	1745	0
Q Serve(g_s), s	2.9	11.9	7.5	5.5	13.8	14.0	5.8	11.4	11.6	5.5	9.4	0.0
Cycle Q Clear(g_c), s	2.9	11.9	7.5	5.5	13.8	14.0	5.8	11.4	11.6	5.5	9.4	0.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.36	1.00		0.00
Lane Grp Cap(c), veh/h	215	576	416	285	370	365	510	712	703	460	1369	
V/C Ratio(X)	0.28	0.75	0.36	0.45	0.73	0.74	0.35	0.40	0.41	0.37	0.34	
Avail Cap(c_a), veh/h	225	727	486	416	570	563	523	712	703	461	1369	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.1	39.7	30.2	30.6	37.4	37.7	15.3	21.8	22.0	15.6	21.3	0.0
Incr Delay (d2), s/veh	0.7	3.3	0.5	1.1	2.8	2.9	0.4	1.7	1.7	0.5	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	9.0	5.1	4.3	10.2	10.3	4.0	8.6	8.6	3.8	6.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.8	43.0	30.8	31.6	40.2	40.6	15.7	23.5	23.7	16.1	22.0	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	B	C	
Approach Vol, veh/h		641			668			751			635	
Approach Delay, s/veh		39.2			38.7			21.7			20.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	45.2	15.9	23.6	15.0	45.5	12.4	27.1
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	15.0	20.0	8.0	27.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	8.3	11.9	8.0	14.4	8.0	13.9	5.4	16.3
Green Ext Time (p_c), s	0.0	1.6	0.2	1.3	0.0	1.7	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	29.8
HCM 6th LOS	C

Notes

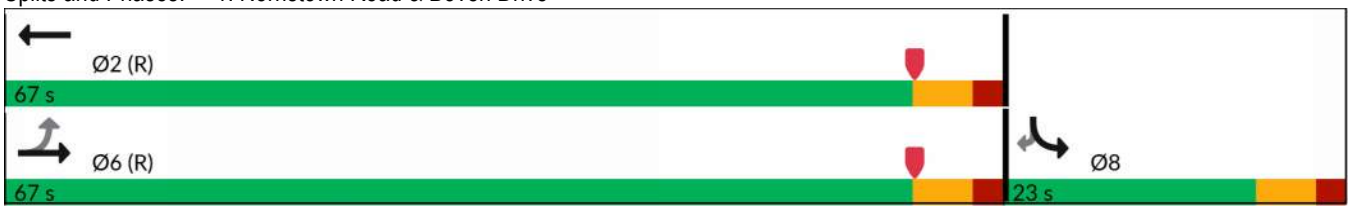
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2027 Projected Conditions

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	701	632	59	50	111
Future Volume (vph)	147	701	632	59	50	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.987			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3154	0	1906	1137
Flt Permitted	0.378				0.950	
Satd. Flow (perm)	664	3211	3154	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			25			116
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	153	730	658	61	52	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	730	719	0	52	116
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	67.0	67.0	67.0		23.0	23.0
Total Split (%)	74.4%	74.4%	74.4%		25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	701	632	59	50	111
Future Volume (veh/h)	147	701	632	59	50	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	153	730	658	61	52	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	642	2643	2376	220	261	155
Arrive On Green	0.77	0.77	1.00	1.00	0.12	0.12
Sat Flow, veh/h	735	3544	3193	288	2115	1255
Grp Volume(v), veh/h	153	730	355	364	52	115
Grp Sat Flow(s),veh/h/ln	735	1727	1678	1715	2115	1255
Q Serve(g_s), s	5.6	5.7	0.0	0.0	2.0	8.0
Cycle Q Clear(g_c), s	5.6	5.7	0.0	0.0	2.0	8.0
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	642	2643	1284	1312	261	155
V/C Ratio(X)	0.24	0.28	0.28	0.28	0.20	0.74
Avail Cap(c_a), veh/h	642	2643	1284	1312	423	251
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.1	3.1	0.0	0.0	35.4	38.0
Incr Delay (d2), s/veh	0.9	0.3	0.5	0.5	0.4	6.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	2.1	0.3	0.3	1.9	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.0	3.4	0.5	0.5	35.8	44.8
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		883	719		167	
Approach Delay, s/veh		3.5	0.5		42.0	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.9				73.9	16.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	61.0				61.0	17.0
Max Q Clear Time (g_c+I1), s	2.0				7.7	10.0
Green Ext Time (p_c), s	25.4				22.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.9
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	757	1	0	695	3	2
Future Volume (vph)	757	1	0	695	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	797	1	0	732	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	798	0	0	732	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	757	1	0	695	3	2
Future Vol, veh/h	757	1	0	695	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	797	1	0	732	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	798	0	1164	399
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	366	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	961	-	*731	*1025
Stage 1	-	-	-	-	*715	-
Stage 2	-	-	-	-	*953	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	961	-	*731	*1025
Mov Cap-2 Maneuver	-	-	-	-	*731	-
Stage 1	-	-	-	-	*715	-
Stage 2	-	-	-	-	*953	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	826	-	-	961	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Control Delay (s/veh)	9.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	578	0	0	716	28	756	0	275	0	0	0
Future Volume (vph)	4	578	0	0	716	28	756	0	275	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.994				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5800	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5800	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					7				258			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	4	590	0	0	731	29	771	0	281	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	4	590	0	0	760	0	385	386	281	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	14.0				21.0		28.0	28.0	28.0			
Total Split (%)	15.6%				23.3%		31.1%	31.1%	31.1%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	8.7	56.7			18.9		23.3	23.3	23.3			
Actuated g/C Ratio	0.10	0.63			0.21		0.26	0.26	0.26			
v/c Ratio	0.03	0.30			0.62		0.92	0.93	0.48			
Control Delay (s/veh)	14.5	2.4			24.4		64.4	64.8	7.9			
Queue Delay	0.0	0.4			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	14.5	2.9			24.5		64.4	64.8	7.9			

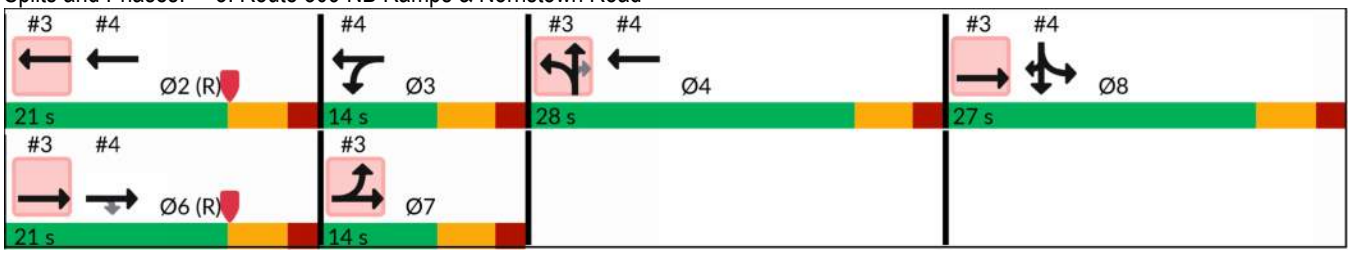
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	14.0	21.0	27.0
Total Split (%)	16%	23%	30%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		E	E	A			
Approach Delay (s/veh)		3.0			24.6			49.5				
Approach LOS		A			C			D				
Queue Length 50th (ft)	2	33			71		226	226	10			
Queue Length 95th (ft)	m4	56			92		#409	#410	73			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	131	1918			1221		414	414	585			
Starvation Cap Reductn	0	828			0		0	0	0			
Spillback Cap Reductn	0	0			31		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.54			0.64		0.93	0.93	0.48			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay (s/veh): 30.1 Intersection LOS: C
Intersection Capacity Utilization 92.2% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	547	530	189	1279	0	0	0	0	49	0	23
Future Volume (vph)	0	547	530	189	1279	0	0	0	0	49	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1694
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			535									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	553	535	191	1292	0	0	0	0	49	0	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	553	535	191	1292	0	0	0	0	0	49	23
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		21.0	21.0	14.0						27.0	27.0	27.0
Total Split (%)		23.3%	23.3%	15.6%						30.0%	30.0%	30.0%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		18.9	18.9	8.7	60.9						19.1	19.1
Actuated g/C Ratio		0.21	0.21	0.10	0.68						0.21	0.21
v/c Ratio		0.58	0.75	0.62	0.59						0.14	0.04
Control Delay (s/veh)		33.7	14.7	46.8	3.7						28.8	0.1
Queue Delay		0.0	0.0	0.0	6.8						0.0	0.0
Total Delay (s/veh)		33.7	14.7	46.8	10.6						28.8	0.1

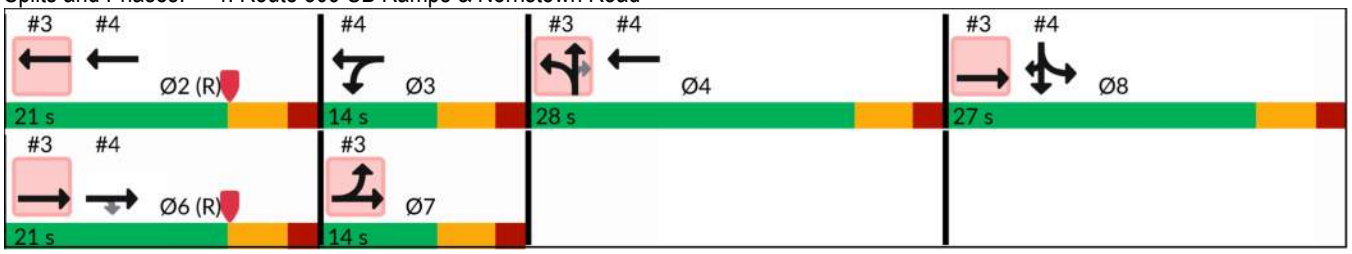
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	21.0	28.0	14.0
Total Split (%)	23%	31%	16%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	B	D	B						C	A
Approach Delay (s/veh)		24.4			15.3						19.7	
Approach LOS		C			B						B	
Queue Length 50th (ft)		104	0	61	50						23	0
Queue Length 95th (ft)		147	#250	m81	m41						51	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		943	709	315	2134						384	557
Starvation Cap Reductn		0	0	0	792						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.59	0.75	0.61	0.96						0.13	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay (s/veh): 19.2 Intersection LOS: B
Intersection Capacity Utilization 92.2% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

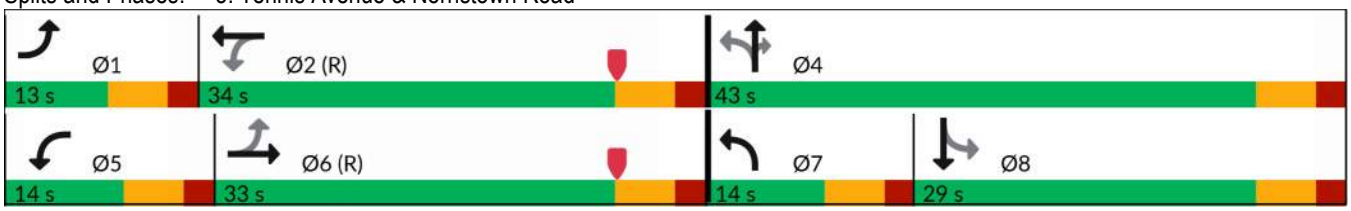
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	482	48	104	416	4	57	94	88	3	167	205
Future Volume (vph)	225	482	48	104	416	4	57	94	88	3	167	205
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.986			0.999				0.850		0.926	
Flt Protected	0.950			0.950				0.981				
Satd. Flow (prot)	1652	3215	0	1613	1759	0	0	1654	1465	0	1532	0
Flt Permitted	0.250			0.432				0.625			0.998	
Satd. Flow (perm)	435	3215	0	733	1759	0	0	1054	1465	0	1529	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		66	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	245	524	52	113	452	4	62	102	96	3	182	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	576	0	113	456	0	0	164	96	0	408	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	33.0		14.0	34.0		14.0	43.0	43.0	29.0	29.0	
Total Split (%)	14.4%	36.7%		15.6%	37.8%		15.6%	47.8%	47.8%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	50.3	39.8		42.7	33.4			28.3	28.3		28.3	
Actuated g/C Ratio	0.56	0.44		0.47	0.37			0.31	0.31		0.31	
v/c Ratio	0.58	0.40		0.25	0.69			0.49	0.17		0.77	
Control Delay (s/veh)	23.9	10.4		12.3	32.7			29.2	3.8		33.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	23.9	10.4		12.3	32.7			29.2	3.8		33.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	B		B	C			C	A		C	
Approach Delay (s/veh)		14.5			28.7			19.9			33.3	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	52	60		28	230			74	0		175	
Queue Length 95th (ft)	#171	94		64	#391			120	24		253	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	422	1421		448	653			445	681		539	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.58	0.41		0.25	0.70			0.37	0.14		0.76	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay (s/veh): 22.8 Intersection LOS: C
Intersection Capacity Utilization 84.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

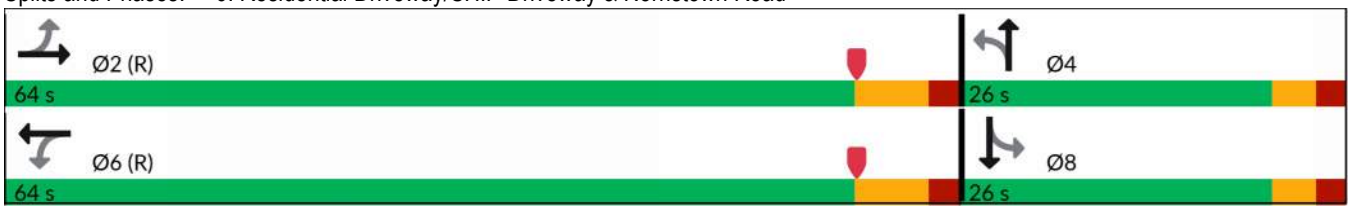
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1063	21	17	1219	10	7	0	10	7	0	5
Future Volume (vph)	27	1063	21	17	1219	10	7	0	10	7	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.999			0.850			0.850	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3261	0	0	3363	0	1701	1269	0	1492	1522	0
Flt Permitted		0.892			0.929							
Satd. Flow (perm)	0	2912	0	0	3127	0	1791	1269	0	1571	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2			115			81	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	28	1096	22	18	1257	10	7	0	10	7	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1146	0	0	1285	0	7	10	0	7	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1063	21	17	1219	10	7	0	10	7	0	5
Future Volume (veh/h)	27	1063	21	17	1219	10	7	0	10	7	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	28	1096	21	18	1257	10	7	0	3	7	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	77	2663	51	58	2999	24	111	0	35	106	0	35
Arrive On Green	0.85	0.87	0.85	0.85	0.87	0.85	0.02	0.00	0.01	0.02	0.00	0.01
Sat Flow, veh/h	41	3076	58	20	3465	27	1359	0	1521	1208	0	1521
Grp Volume(v), veh/h	579	0	566	665	0	620	7	0	3	7	0	1
Grp Sat Flow(s),veh/h/ln	1604	0	1571	1816	0	1696	1359	0	1521	1208	0	1521
Q Serve(g_s), s	0.0	0.0	6.8	0.0	0.0	7.0	0.5	0.0	0.2	0.5	0.0	0.1
Cycle Q Clear(g_c), s	6.1	0.0	6.8	6.7	0.0	7.0	0.5	0.0	0.2	0.7	0.0	0.1
Prop In Lane	0.05		0.04	0.03		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1413	0	1360	1593	0	1468	111	0	35	106	0	35
V/C Ratio(X)	0.41	0.00	0.42	0.42	0.00	0.42	0.06	0.00	0.09	0.07	0.00	0.03
Avail Cap(c_a), veh/h	1413	0	1360	1593	0	1468	411	0	372	373	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.50	0.00	0.50	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.2	0.0	1.3	1.3	0.0	1.3	43.2	0.0	43.5	43.4	0.0	43.5
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.8	0.0	0.9	0.2	0.0	1.0	0.3	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.0	0.3	0.7	0.0	0.7	0.3	0.0	0.1	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	1.7	0.0	1.7	2.1	0.0	2.2	43.5	0.0	44.5	43.6	0.0	43.8
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1145			1285			10			8	
Approach Delay, s/veh		1.7			2.1			43.8			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.2
HCM 6th LOS	A

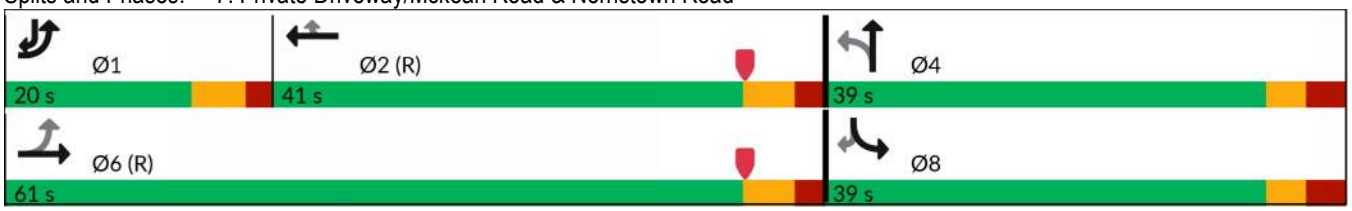
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	915	0	0	871	216	0	0	0	164	0	113
Future Volume (vph)	172	915	0	0	871	216	0	0	0	164	0	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3315	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted		0.574								0.950		
Satd. Flow (perm)	0	1918	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						243						33
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	193	1028	0	0	979	243	0	0	0	184	0	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1221	0	0	979	243	0	0	0	184	0	127
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	61.0			41.0	41.0	39.0	39.0		39.0		20.0
Total Split (%)	20.0%	61.0%			41.0%	41.0%	39.0%	39.0%		39.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		72.1			60.3	60.3				17.9		29.7
Actuated g/C Ratio		0.72			0.60	0.60				0.18		0.30
v/c Ratio		0.82			0.48	0.23				0.64		0.27
Control Delay (s/veh)		15.5			12.9	2.1				47.7		19.9
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		15.5			12.9	2.1				47.7		19.9
LOS		B			B	A				D		B
Approach Delay (s/veh)		15.5			10.8						36.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B						D	
Queue Length 50th (ft)		155			170	0				110		45
Queue Length 95th (ft)		#268			257	33				166		82
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1478			2031	1014				545		577
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.83			0.48	0.24				0.34		0.22

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 15.8 Intersection LOS: B
Intersection Capacity Utilization 78.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

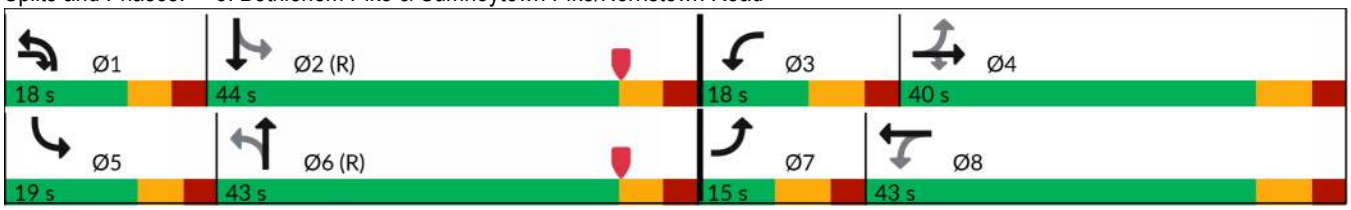
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	862	287	165	728	61	205	266	185	110	396	57
Future Volume (vph)	49	862	287	165	728	61	205	266	185	110	396	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.988			0.938			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3237	0	1528	3038	0	1588	3033	0
Flt Permitted	0.185			0.103			0.365			0.385		
Satd. Flow (perm)	305	3257	1562	181	3237	0	587	3038	0	644	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			184					151			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	53	927	309	177	783	66	220	286	199	118	426	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	927	309	177	849	0	220	485	0	118	487	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	40.0	18.0	18.0	43.0		18.0	43.0		19.0	44.0	
Total Split (%)	12.5%	33.3%	15.0%	15.0%	35.8%		15.0%	35.8%		15.8%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	862	287	165	728	61	205	266	185	110	396	57
Future Volume (veh/h)	49	862	287	165	728	61	205	266	185	110	396	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	53	927	227	177	783	66	220	286	147	118	426	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	206	945	584	233	1090	92	439	781	391	420	1071	
Arrive On Green	0.04	0.28	0.28	0.09	0.32	0.31	0.10	0.34	0.34	0.07	0.32	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3381	285	1739	2274	1138	1736	3472	0
Grp Volume(v), veh/h	53	927	227	177	419	430	220	220	213	118	426	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1855	1739	1762	1650	1736	1691	0
Q Serve(g_s), s	2.7	32.1	12.8	7.9	24.5	24.5	10.1	11.2	11.8	5.3	11.8	0.0
Cycle Q Clear(g_c), s	2.7	32.1	12.8	7.9	24.5	24.5	10.1	11.2	11.8	5.3	11.8	0.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.69	1.00		0.00
Lane Grp Cap(c), veh/h	206	945	584	233	584	598	439	605	567	420	1071	
V/C Ratio(X)	0.26	0.98	0.39	0.76	0.72	0.72	0.50	0.36	0.38	0.28	0.40	
Avail Cap(c_a), veh/h	243	945	584	233	584	598	439	605	567	480	1071	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	43.2	27.4	30.7	35.8	35.9	24.1	29.6	30.0	24.3	32.1	0.0
Incr Delay (d2), s/veh	0.7	24.6	0.4	12.3	3.8	3.7	0.9	1.7	1.9	0.4	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	23.3	8.2	7.3	16.1	16.5	7.5	8.6	8.5	3.9	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.0	67.8	27.9	43.0	39.6	39.6	25.0	31.2	31.9	24.6	33.2	0.0
LnGrp LOS	C	E	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1207			1026			653			544	
Approach Delay, s/veh		58.6			40.2			29.4			31.3	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	44.0	18.0	40.0	14.8	47.2	12.3	45.7
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	10.0	32.0	12.0	36.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	12.6	14.3	10.4	34.6	7.8	13.8	5.2	27.0
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.1	1.5	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	43.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	1019	561	62	94	168
Future Volume (vph)	151	1019	561	62	94	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.985			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3183	0	1906	1705
Flt Permitted	0.345				0.950	
Satd. Flow (perm)	606	3274	3183	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			205
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	191	1290	710	78	119	213
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	1290	788	0	119	213
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	55.0	55.0	55.0		35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%		38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	1019	561	62	94	168
Future Volume (veh/h)	151	1019	561	62	94	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	191	1290	710	78	119	203
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	590	2594	2255	248	316	281
Arrive On Green	0.74	0.74	1.00	1.00	0.15	0.15
Sat Flow, veh/h	689	3600	3138	335	2115	1882
Grp Volume(v), veh/h	191	1290	390	398	119	203
Grp Sat Flow(s),veh/h/ln	689	1754	1678	1706	2115	1882
Q Serve(g_s), s	9.0	13.6	0.0	0.0	4.6	9.3
Cycle Q Clear(g_c), s	9.0	13.6	0.0	0.0	4.6	9.3
Prop In Lane	1.00			0.20	1.00	1.00
Lane Grp Cap(c), veh/h	590	2594	1241	1262	316	281
V/C Ratio(X)	0.32	0.50	0.31	0.32	0.38	0.72
Avail Cap(c_a), veh/h	590	2594	1241	1262	705	627
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	4.8	0.0	0.0	34.5	36.5
Incr Delay (d2), s/veh	1.5	0.7	0.7	0.7	0.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	5.9	0.4	0.4	4.3	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.7	5.5	0.7	0.7	35.3	40.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1481	788		322	
Approach Delay, s/veh		5.5	0.7		38.3	
Approach LOS		A	A		D	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	71.6	71.6	18.4
Change Period (Y+Rc), s	6.0	6.0	6.0
Max Green Setting (Gmax), s	49.0	49.0	29.0
Max Q Clear Time (g_c+I1), s	2.0	15.6	11.3
Green Ext Time (p_c), s	25.4	29.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.1
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1148	2	1	621	3	1
Future Volume (vph)	1148	2	1	621	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1367	2	1	739	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1369	0	0	740	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1148	2	1	621	3	1
Future Vol, veh/h	1148	2	1	621	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1367	2	1	739	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1369	0	1740	685
Stage 1	-	-	-	-	1368	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	615	-	*186	*896
Stage 1	-	-	-	-	*385	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	615	-	*186	*896
Mov Cap-2 Maneuver	-	-	-	-	*186	-
Stage 1	-	-	-	-	*385	-
Stage 2	-	-	-	-	*991	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	20.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	232	-	-	615	-
HCM Lane V/C Ratio	0.021	-	-	0.002	-
HCM Control Delay (s/veh)	20.8	-	-	10.9	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	953	0	0	660	62	375	0	203	0	0	0
Future Volume (vph)	18	953	0	0	660	62	375	0	203	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.987				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5748	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5748	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					25				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	22	1162	0	0	805	76	457	0	248	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	22	1162	0	0	881	0	228	229	248	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	14.0				34.0		22.0	22.0	22.0			
Total Split (%)	15.6%				37.8%		24.4%	24.4%	24.4%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	9.0	63.0			29.0		17.0	17.0	17.0			
Actuated g/C Ratio	0.10	0.70			0.32		0.19	0.19	0.19			
v/c Ratio	0.13	0.51			0.47		0.76	0.76	0.58			
Control Delay (s/veh)	32.8	4.9			17.8		52.7	53.0	16.2			
Queue Delay	0.0	0.4			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	32.8	5.4			17.8		52.7	53.0	16.2			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		6.0			17.9			40.0				

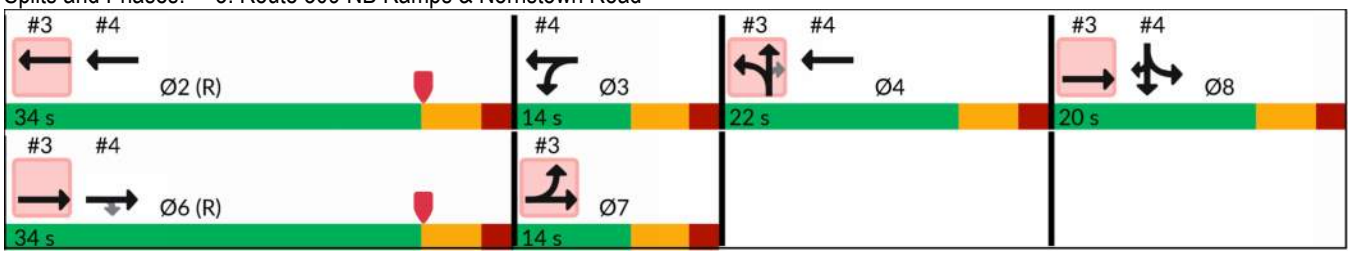
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	14.0	34.0	20.0
Total Split (%)	16%	38%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	13	70			84		130	131	32			
Queue Length 95th (ft)	m33	53			84		#209	#210	84			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	164	2257			1869		299	299	426			
Starvation Cap Reductn	0	588			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.13	0.70			0.47		0.76	0.77	0.58			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 18.4 Intersection LOS: B
Intersection Capacity Utilization 104.7% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	579	868	186	951	0	0	0	0	28	2	7
Future Volume (vph)	0	579	868	186	951	0	0	0	0	28	2	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.955	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1690	1717
Flt Permitted				0.950							0.955	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1690	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			872									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	609	914	196	1001	0	0	0	0	29	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	609	914	196	1001	0	0	0	0	0	31	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	14.0						20.0	20.0	20.0
Total Split (%)		37.8%	37.8%	15.6%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		29.0	29.0	9.0	65.0						15.0	15.0
Actuated g/C Ratio		0.32	0.32	0.10	0.72						0.17	0.17
v/c Ratio		0.40	0.87	0.62	0.42						0.11	0.01
Control Delay (s/veh)		21.7	21.8	48.0	2.0						33.1	0.0
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		21.7	21.8	48.0	2.5						33.1	0.0
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		21.8			10.0						27.0	

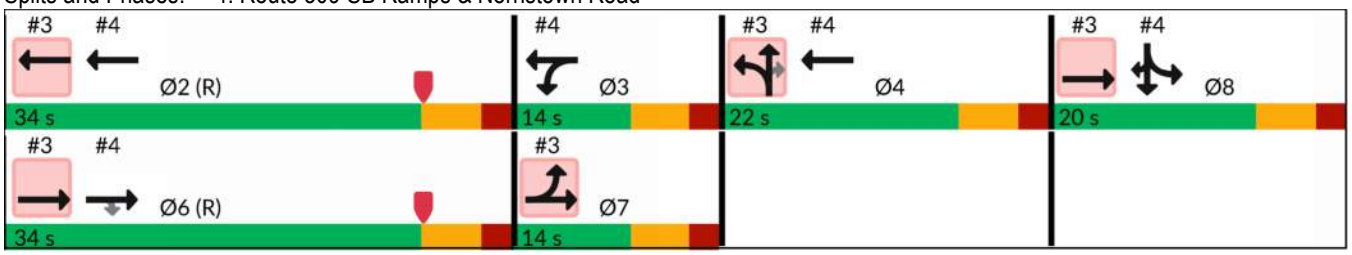
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	22.0	14.0
Total Split (%)	38%	24%	16%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			B						C	
Queue Length 50th (ft)		111	318	63	12						15	0
Queue Length 95th (ft)		131	#552	m92	32						40	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1508	1044	315	2352						281	437
Starvation Cap Reductn		0	0	0	813						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.40	0.88	0.62	0.65						0.11	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 16.8 Intersection LOS: B
Intersection Capacity Utilization 104.7% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

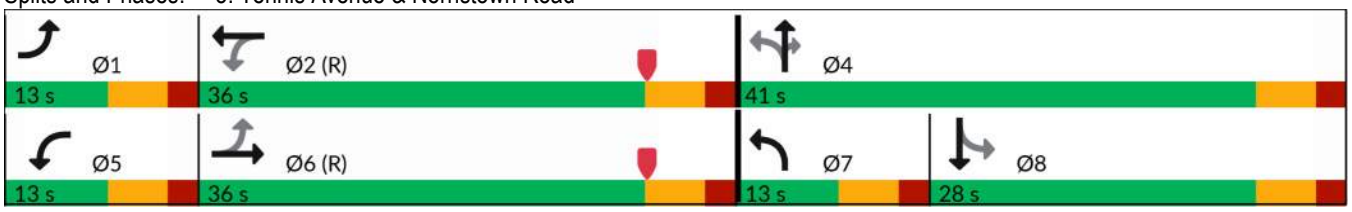
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	523	401	74	393	13	69	153	85	8	123	151
Future Volume (vph)	224	523	401	74	393	13	69	153	85	8	123	151
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935			0.995				0.850		0.928	
Flt Protected	0.950			0.950				0.985			0.999	
Satd. Flow (prot)	1652	3119	0	1693	1736	0	0	1672	1493	0	1568	0
Flt Permitted	0.279			0.187				0.694			0.989	
Satd. Flow (perm)	485	3119	0	333	1736	0	0	1178	1493	0	1552	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		62	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	252	588	451	83	442	15	78	172	96	9	138	170
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	1039	0	83	457	0	0	250	96	0	317	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	51.5	42.3		44.2	36.3			27.1	27.1		27.1	
Actuated g/C Ratio	0.57	0.47		0.49	0.40			0.30	0.30		0.30	
v/c Ratio	0.58	0.70		0.29	0.65			0.70	0.18		0.62	
Control Delay (s/veh)	14.6	16.2		13.4	29.1			38.0	3.9		25.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	14.6	16.2		13.4	29.1			38.0	3.9		25.8	
LOS	B	B		B	C			D	A		C	
Approach Delay (s/veh)		16.0			26.7			28.6			25.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	27	158		19	222			124	0		122	
Queue Length 95th (ft)	#95	#436		48	#345			179	23		177	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	429	1465		291	700			471	662		530	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.59	0.71		0.29	0.65			0.53	0.15		0.60	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay (s/veh): 21.3 Intersection LOS: C
Intersection Capacity Utilization 82.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

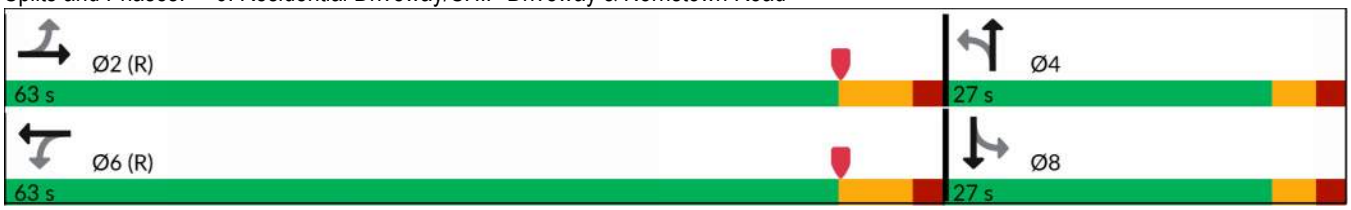
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1316	15	15	961	3	13	0	39	50	0	44
Future Volume (vph)	6	1316	15	15	961	3	13	0	39	50	0	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.850			0.850	
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1668	1492	0
Flt Permitted		0.950			0.914		0.725			0.729		
Satd. Flow (perm)	0	3192	0	0	3142	0	1298	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			49			117	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	7	1462	17	17	1068	3	14	0	43	56	0	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1486	0	0	1088	0	14	43	0	56	49	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1316	15	15	961	3	13	0	39	50	0	44
Future Volume (veh/h)	6	1316	15	15	961	3	13	0	39	50	0	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	7	1462	15	17	1068	3	14	0	21	56	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	44	2691	28	58	2818	8	177	0	129	174	0	129
Arrive On Green	1.00	1.00	1.00	0.79	0.80	0.79	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	4	3346	34	21	3504	10	1336	0	1521	1314	0	1521
Grp Volume(v), veh/h	777	0	707	557	0	531	14	0	21	56	0	20
Grp Sat Flow(s),veh/h/ln	1770	0	1614	1809	0	1725	1336	0	1521	1314	0	1521
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	7.8	0.9	0.0	1.2	3.7	0.0	1.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.4	0.0	7.8	2.0	0.0	1.2	4.9	0.0	1.1
Prop In Lane	0.01		0.02	0.03		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1445	0	1298	1476	0	1387	177	0	129	174	0	129
V/C Ratio(X)	0.54	0.00	0.54	0.38	0.00	0.38	0.08	0.00	0.16	0.32	0.00	0.16
Avail Cap(c_a), veh/h	1445	0	1298	1476	0	1387	405	0	389	399	0	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.52	0.00	0.52	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	2.5	0.0	2.5	39.1	0.0	38.7	40.5	0.0	38.7
Incr Delay (d2), s/veh	0.8	0.0	0.9	0.7	0.0	0.8	0.2	0.0	0.6	1.1	0.0	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.0	0.6	2.8	0.0	2.4	0.5	0.0	0.8	2.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.8	0.0	0.9	3.2	0.0	3.3	39.3	0.0	39.3	41.6	0.0	39.2
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1484			1088			35			76	
Approach Delay, s/veh		0.8			3.2			39.3			41.0	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.4	11.6	78.4	11.6
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	56.0	22.0	56.0	22.0
Max Q Clear Time (g_c+I1), s	0.0	4.0	0.0	6.9
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.4
HCM 6th LOS	A

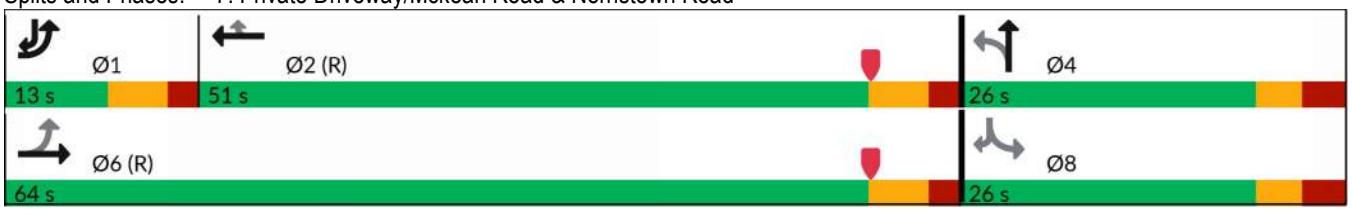
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	1044	0	0	887	128	0	0	0	239	0	180
Future Volume (vph)	104	1044	0	0	887	128	0	0	0	239	0	180
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	3355	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted		0.676								0.757		
Satd. Flow (perm)	0	2280	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						136						94
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	111	1111	0	0	944	136	0	0	0	254	0	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1222	0	0	944	136	0	0	0	254	0	191
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	64.0			51.0	51.0	26.0	26.0		26.0		13.0
Total Split (%)	14.4%	71.1%			56.7%	56.7%	28.9%	28.9%		28.9%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		59.8			48.0	48.0				20.2		32.0
Actuated g/C Ratio		0.66			0.53	0.53				0.22		0.36
v/c Ratio		0.76			0.52	0.15				0.87		0.32
Control Delay (s/veh)		13.4			9.3	2.5				64.4		12.0
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		13.4			9.3	2.5				64.4		12.0
LOS		B			A	A				E		B
Approach Delay (s/veh)		13.4			8.5						41.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		175			122	9				139		37
Queue Length 95th (ft)		227			140	18				#272		87
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1596			1813	883				301		612
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.77			0.52	0.15				0.84		0.31

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 16.1 Intersection LOS: B
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road

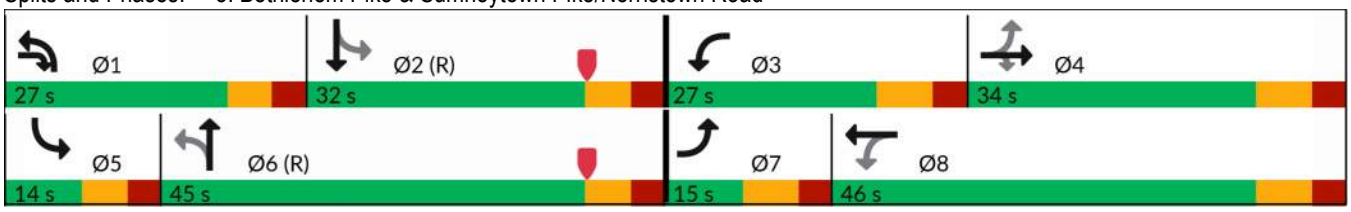


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	791	196	236	762	105	226	481	210	175	423	42
Future Volume (vph)	60	791	196	236	762	105	226	481	210	175	423	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.982			0.954			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3245	0	1604	3170	0	1604	3138	0
Flt Permitted	0.208			0.105			0.258			0.285		
Satd. Flow (perm)	357	3290	1603	186	3245	0	436	3170	0	481	3138	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					61			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	63	833	206	248	802	111	238	506	221	184	445	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	833	206	248	913	0	238	727	0	184	489	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	34.0	27.0	27.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	28.3%	22.5%	22.5%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	791	196	236	762	105	226	481	210	175	423	42
Future Volume (veh/h)	60	791	196	236	762	105	226	481	210	175	423	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	63	833	154	248	802	111	238	506	184	184	445	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	190	779	548	300	976	135	473	940	340	331	1084	
Arrive On Green	0.05	0.22	0.22	0.13	0.30	0.29	0.12	0.36	0.35	0.07	0.31	0.00
Sat Flow, veh/h	1723	3464	1605	1856	3219	445	1807	2593	938	1750	3555	0
Grp Volume(v), veh/h	63	833	154	248	455	458	238	351	339	184	445	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1605	1856	1825	1840	1807	1803	1729	1750	1732	0
Q Serve(g_s), s	3.3	27.0	8.4	11.6	27.7	27.8	10.0	18.5	18.7	8.0	12.2	0.0
Cycle Q Clear(g_c), s	3.3	27.0	8.4	11.6	27.7	27.8	10.0	18.5	18.7	8.0	12.2	0.0
Prop In Lane	1.00		1.00	1.00		0.24	1.00		0.54	1.00		0.00
Lane Grp Cap(c), veh/h	190	779	548	300	553	558	473	654	627	331	1084	
V/C Ratio(X)	0.33	1.07	0.28	0.83	0.82	0.82	0.50	0.54	0.54	0.56	0.41	
Avail Cap(c_a), veh/h	217	779	548	369	593	598	579	654	627	331	1084	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.2	46.5	28.8	31.0	38.8	38.9	22.1	30.3	30.6	27.6	32.5	0.0
Incr Delay (d2), s/veh	1.0	52.2	0.3	10.7	7.6	7.5	0.8	3.1	3.3	2.0	1.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	24.8	5.7	9.6	18.6	18.8	7.6	13.1	12.9	6.7	8.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.2	98.7	29.1	41.7	46.4	46.4	22.9	33.4	33.9	29.6	33.7	0.0
LnGrp LOS	D	F	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1050			1161			928			629	
Approach Delay, s/veh		84.7			45.4			30.9			32.5	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	43.5	22.5	34.0	14.0	49.5	13.1	43.4
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	19.0	26.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	12.5	14.7	14.1	29.5	10.5	21.0	5.8	30.2
Green Ext Time (p_c), s	0.5	1.3	0.3	0.0	0.0	2.4	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	50.6
HCM 6th LOS	D

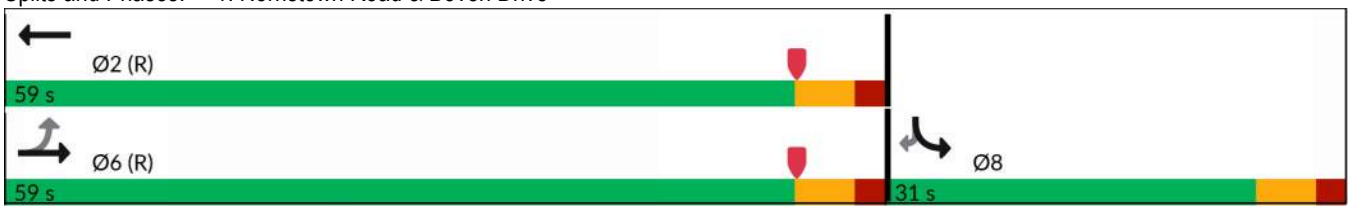
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	539	536	77	79	170
Future Volume (vph)	170	539	536	77	79	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.981			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3227	0	1906	1705
Flt Permitted	0.407				0.950	
Satd. Flow (perm)	715	3306	3227	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			31			179
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	179	567	564	81	83	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	567	645	0	83	179
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	59.0	59.0	59.0		31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%		34.4%	34.4%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	539	536	77	79	170
Future Volume (veh/h)	170	539	536	77	79	170
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	179	567	564	81	83	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	675	2671	2262	324	282	251
Arrive On Green	0.76	0.76	1.00	1.00	0.13	0.13
Sat Flow, veh/h	787	3628	3083	429	2115	1882
Grp Volume(v), veh/h	179	567	321	324	83	178
Grp Sat Flow(s),veh/h/ln	787	1767	1705	1717	2115	1882
Q Serve(g_s), s	6.5	4.2	0.0	0.0	3.2	8.1
Cycle Q Clear(g_c), s	6.5	4.2	0.0	0.0	3.2	8.1
Prop In Lane	1.00			0.25	1.00	1.00
Lane Grp Cap(c), veh/h	675	2671	1288	1298	282	251
V/C Ratio(X)	0.27	0.21	0.25	0.25	0.29	0.71
Avail Cap(c_a), veh/h	675	2671	1288	1298	611	544
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.2	0.0	0.0	35.2	37.3
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.5	0.6	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	1.7	0.3	0.3	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.4	3.4	0.5	0.5	35.8	41.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		746	645		261	
Approach Delay, s/veh		3.6	0.5		39.3	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.0				73.0	17.0
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	53.0				53.0	25.0
Max Q Clear Time (g_c+I1), s	2.0				6.2	10.1
Green Ext Time (p_c), s	20.9				14.5	0.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.0
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	626	2	1	614	1	2
Future Volume (vph)	626	2	1	614	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	659	2	1	646	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	661	0	0	647	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	626	2	1	614	1	2
Future Vol, veh/h	626	2	1	614	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	659	2	1	646	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	661	0	985	331
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1060	-	*856	*1051
Stage 1	-	-	-	-	*823	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1060	-	*855	*1051
Mov Cap-2 Maneuver	-	-	-	-	*855	-
Stage 1	-	-	-	-	*823	-
Stage 2	-	-	-	-	*993	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	976	-	-	1060	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.7	-	-	8.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	539	0	0	646	42	344	0	201	0	0	0
Future Volume (vph)	5	539	0	0	646	42	344	0	201	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.991				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5902	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5902	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					16				209			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	5	561	0	0	673	44	358	0	209	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	5	561	0	0	717	0	179	179	209	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		18.0	18.0	18.0			
Total Split (%)	14.4%				37.8%		20.0%	20.0%	20.0%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.8	66.8			32.5		13.2	13.2	13.2			
Actuated g/C Ratio	0.09	0.74			0.36		0.15	0.15	0.15			
v/c Ratio	0.03	0.23			0.33		0.75	0.75	0.52			
Control Delay (s/veh)	27.8	1.4			21.5		58.6	58.6	10.3			
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	27.8	1.5			21.5		58.6	58.6	10.3			
LOS	C	A			C		E	E	B			
Approach Delay (s/veh)		1.8			21.6			40.8				

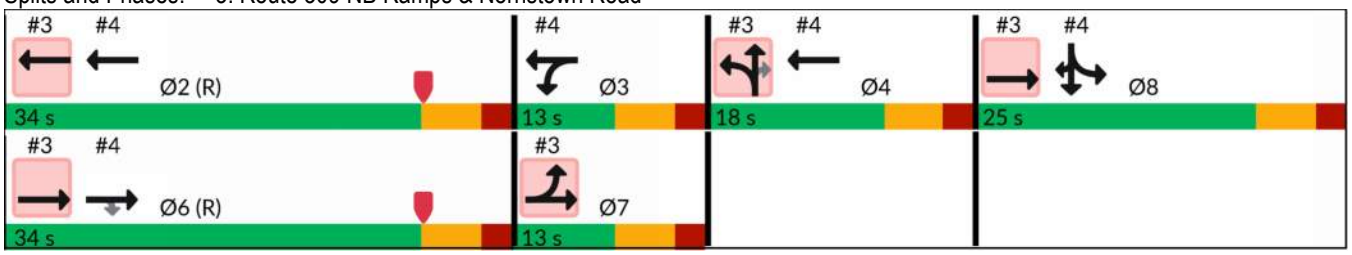
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	25.0
Total Split (%)	14%	38%	28%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			D				
Queue Length 50th (ft)	3	8			85		104	104	0			
Queue Length 95th (ft)	m10	29			110		#212	#212	61			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2407			2144		237	237	401			
Starvation Cap Reductn	0	892			0		0	0	0			
Spillback Cap Reductn	0	0			40		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.37			0.34		0.76	0.76	0.52			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 21.4 Intersection LOS: C
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	478	360	121	922	0	0	0	0	44	0	11
Future Volume (vph)	0	478	360	121	922	0	0	0	0	44	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			387									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	514	387	130	991	0	0	0	0	47	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	514	387	130	991	0	0	0	0	0	47	12
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						25.0	25.0	25.0
Total Split (%)		37.8%	37.8%	14.4%						27.8%	27.8%	27.8%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.5	32.5	7.8	63.5						16.5	16.5
Actuated g/C Ratio		0.36	0.36	0.09	0.71						0.18	0.18
v/c Ratio		0.30	0.51	0.47	0.43						0.15	0.02
Control Delay (s/veh)		20.3	7.8	46.9	3.3						31.3	0.0
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		20.3	7.8	46.9	3.8						31.3	0.0
LOS		C	A	D	A						C	A
Approach Delay (s/veh)		15.0			8.8						25.0	

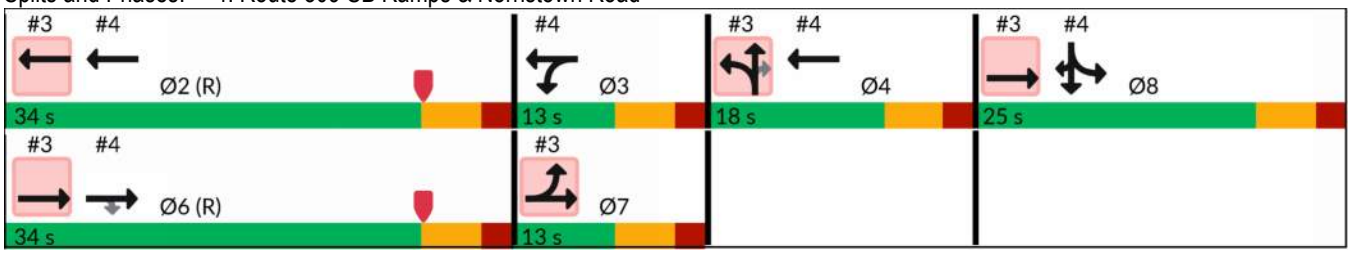
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	18.0	13.0
Total Split (%)	38%	20%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		73	0	41	19						23	0
Queue Length 95th (ft)		110	134	m66	46						50	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1659	755	280	2212						376	523
Starvation Cap Reductn		0	0	0	675						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.31	0.51	0.46	0.64						0.13	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 12.0 Intersection LOS: B
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

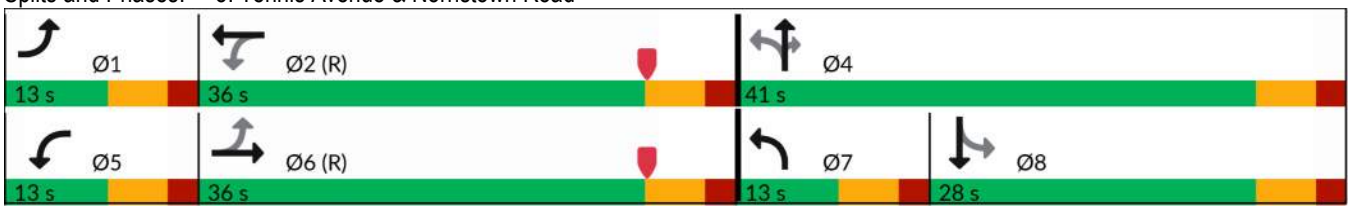
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	441	50	54	413	5	66	83	59	8	83	117
Future Volume (vph)	141	441	50	54	413	5	66	83	59	8	83	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.998				0.850		0.924	
Flt Protected	0.950			0.950				0.978			0.998	
Satd. Flow (prot)	1701	3322	0	1710	1796	0	0	1688	1553	0	1573	0
Flt Permitted	0.392			0.461				0.574			0.987	
Satd. Flow (perm)	702	3322	0	830	1796	0	0	991	1553	0	1556	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		70	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	148	464	53	57	435	5	69	87	62	8	87	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	517	0	57	440	0	0	156	62	0	218	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	59.9	52.0		55.4	47.8			17.8	17.8		17.8	
Actuated g/C Ratio	0.67	0.58		0.62	0.53			0.20	0.20		0.20	
v/c Ratio	0.25	0.26		0.09	0.46			0.80	0.15		0.60	
Control Delay (s/veh)	3.0	4.6		6.5	16.9			61.6	2.1		28.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	3.0	4.6		6.5	16.9			61.6	2.1		28.0	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		4.3			15.7			44.7			28.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	6	34		9	145			85	0		76	
Queue Length 95th (ft)	21	59		27	285			142	9		134	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	573	1918		597	955			396	686		456	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.26	0.27		0.10	0.46			0.39	0.09		0.48	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay (s/veh): 16.6 Intersection LOS: B
Intersection Capacity Utilization 69.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Tennis Avenue & Norristown Road

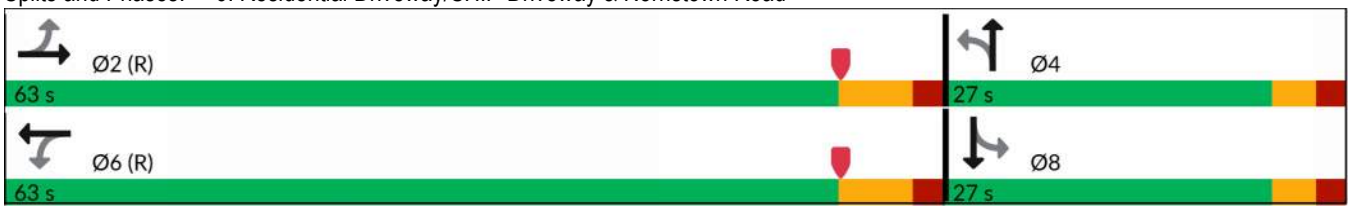


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	837	15	20	841	0	8	0	14	7	0	0
Future Volume (vph)	0	837	15	20	841	0	8	0	14	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99							
Frt		0.997						0.850				
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1701	1791	0
Flt Permitted					0.923							
Satd. Flow (perm)	0	3360	0	0	3173	0	1791	1522	0	1791	1791	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4						179				
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	872	16	21	876	0	8	0	15	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	888	0	0	897	0	8	15	0	7	0	0
Turn Type		NA		Perm	NA		Perm	NA		Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	837	15	20	841	0	8	0	14	7	0	0
Future Volume (veh/h)	0	837	15	20	841	0	8	0	14	7	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	0	872	16	21	876	0	8	0	4	7	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	0	2940	54	78	2953	0	112	0	36	109	43	0
Arrive On Green	0.00	0.87	0.85	0.85	0.87	0.00	0.02	0.00	0.01	0.02	0.00	0.00
Sat Flow, veh/h	0	3487	62	42	3499	0	1360	0	1521	1355	1794	0
Grp Volume(v), veh/h	0	434	454	471	426	0	8	0	4	7	0	0
Grp Sat Flow(s),veh/h/ln	0	1691	1769	1814	1640	0	1360	0	1521	1355	1794	0
Q Serve(g_s), s	0.0	4.2	4.2	0.0	4.3	0.0	0.5	0.0	0.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.2	4.2	4.0	4.3	0.0	0.5	0.0	0.2	0.7	0.0	0.0
Prop In Lane	0.00		0.04	0.04		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1463	1531	1591	1419	0	112	0	36	109	43	0
V/C Ratio(X)	0.00	0.30	0.30	0.30	0.30	0.00	0.07	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	0	1463	1531	1591	1419	0	428	0	389	423	459	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.91	0.91	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.1	1.1	1.1	1.1	0.0	43.1	0.0	43.5	43.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	0.5	0.5	0.0	0.3	0.0	1.3	0.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.3	0.3	0.5	0.4	0.0	0.3	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	1.6	1.6	1.6	1.6	0.0	43.4	0.0	44.8	43.6	0.0	0.0
LnGrp LOS		A	A	A	A		D		D	D		
Approach Vol, veh/h		888			897			12			7	
Approach Delay, s/veh		1.6			1.6			43.9			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	56.0	22.0	56.0	22.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

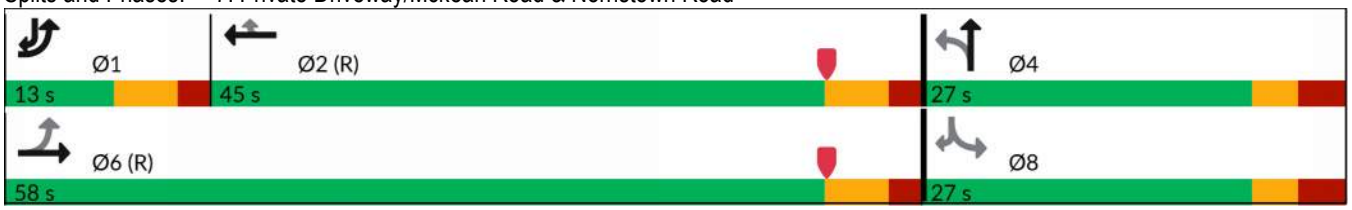
Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.0
HCM 6th LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	626	0	0	622	81	0	0	0	101	0	110
Future Volume (vph)	101	626	0	0	622	81	0	0	0	101	0	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	3350	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted		0.746								0.757		
Satd. Flow (perm)	0	2517	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						120
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	110	680	0	0	676	88	0	0	0	110	0	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	790	0	0	676	88	0	0	0	110	0	120
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	58.0			45.0	45.0	27.0	27.0		27.0		13.0
Total Split (%)	15.3%	68.2%			52.9%	52.9%	31.8%	31.8%		31.8%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		65.1			55.8	55.8				13.5		22.5
Actuated g/C Ratio		0.77			0.66	0.66				0.16		0.26
v/c Ratio		0.39			0.30	0.08				0.53		0.24
Control Delay (s/veh)		5.1			9.4	1.3				41.5		5.2
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		5.1			9.4	1.3				41.5		5.2
LOS		A			A	A				D		A
Approach Delay (s/veh)		5.2			8.5						22.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						C	
Queue Length 50th (ft)		66			89	0				55		0
Queue Length 95th (ft)		117			147	13				98		33
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1978			2212	1049				334		507
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.40			0.31	0.08				0.33		0.24

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay (s/veh): 8.8	Intersection LOS: A
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

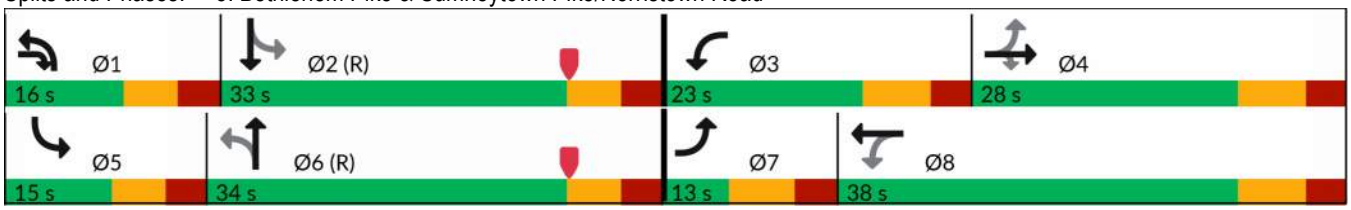
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	440	176	151	448	120	166	436	142	182	433	64
Future Volume (vph)	57	440	176	151	448	120	166	436	142	182	433	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.968			0.963			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3239	0	1558	3207	0	1604	3147	0
Flt Permitted	0.405			0.265			0.343			0.281		
Satd. Flow (perm)	674	3290	1624	470	3239	0	562	3207	0	474	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			218					44			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	61	473	189	162	482	129	178	469	153	196	466	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	473	189	162	611	0	178	622	0	196	535	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	13.0	28.0	16.0	23.0	38.0		16.0	34.0		15.0	33.0	
Total Split (%)	13.0%	28.0%	16.0%	23.0%	38.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	440	176	151	448	120	166	436	142	182	433	64
Future Volume (veh/h)	57	440	176	151	448	120	166	436	142	182	433	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	61	473	148	162	482	125	178	469	139	196	466	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	219	612	437	310	657	169	484	1013	298	421	1270	
Arrive On Green	0.05	0.18	0.18	0.10	0.23	0.22	0.10	0.37	0.36	0.09	0.36	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2893	746	1767	2747	808	1750	3583	0
Grp Volume(v), veh/h	61	473	148	162	305	302	178	307	301	196	466	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1801	1767	1803	1752	1750	1745	0
Q Serve(g_s), s	2.9	13.0	7.4	6.8	15.4	15.6	6.1	12.9	13.2	6.9	9.8	0.0
Cycle Q Clear(g_c), s	2.9	13.0	7.4	6.8	15.4	15.6	6.1	12.9	13.2	6.9	9.8	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.46	1.00		0.00
Lane Grp Cap(c), veh/h	219	612	437	310	417	409	484	665	646	421	1270	
V/C Ratio(X)	0.28	0.77	0.34	0.52	0.73	0.74	0.37	0.46	0.47	0.47	0.37	
Avail Cap(c_a), veh/h	229	727	490	414	570	558	493	665	646	421	1270	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.3	39.2	29.2	29.0	35.8	36.1	16.9	24.0	24.2	17.8	23.4	0.0
Incr Delay (d2), s/veh	0.7	4.3	0.5	1.3	3.0	3.3	0.5	2.3	2.4	0.8	0.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	9.7	5.0	5.4	11.1	11.1	4.3	9.6	9.5	4.9	7.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.0	43.6	29.6	30.3	38.8	39.3	17.3	26.3	26.6	18.6	24.2	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	B	C	
Approach Vol, veh/h		682			769			786			662	
Approach Delay, s/veh		39.5			37.2			24.4			22.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	42.4	17.4	24.7	15.0	42.9	12.4	29.7
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	15.0	20.0	8.0	27.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	8.6	12.3	9.3	15.5	9.4	15.4	5.4	17.9
Green Ext Time (p_c), s	0.0	1.6	0.2	1.2	0.0	1.8	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	30.9
HCM 6th LOS	C

Notes

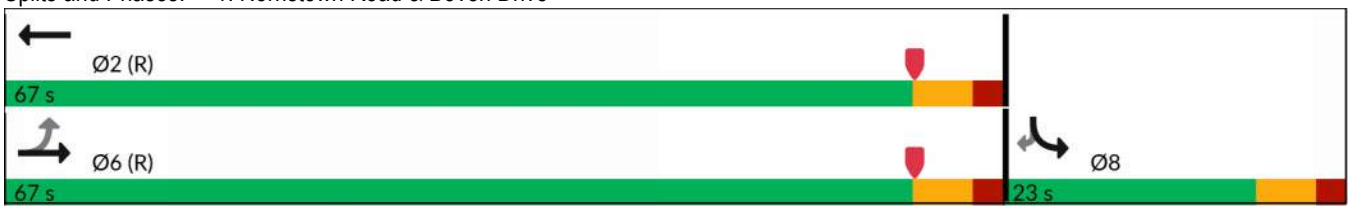
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2027 Projected Conditions with Improvements

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	701	632	59	50	111
Future Volume (vph)	147	701	632	59	50	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.987			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3154	0	1906	1137
Flt Permitted	0.378				0.950	
Satd. Flow (perm)	664	3211	3154	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			25			116
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	153	730	658	61	52	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	730	719	0	52	116
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	67.0	67.0	67.0		23.0	23.0
Total Split (%)	74.4%	74.4%	74.4%		25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	701	632	59	50	111
Future Volume (veh/h)	147	701	632	59	50	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	153	730	658	61	52	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	642	2643	2376	220	261	155
Arrive On Green	0.77	0.77	1.00	1.00	0.12	0.12
Sat Flow, veh/h	735	3544	3193	288	2115	1255
Grp Volume(v), veh/h	153	730	355	364	52	115
Grp Sat Flow(s),veh/h/ln	735	1727	1678	1715	2115	1255
Q Serve(g_s), s	5.6	5.7	0.0	0.0	2.0	8.0
Cycle Q Clear(g_c), s	5.6	5.7	0.0	0.0	2.0	8.0
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	642	2643	1284	1312	261	155
V/C Ratio(X)	0.24	0.28	0.28	0.28	0.20	0.74
Avail Cap(c_a), veh/h	642	2643	1284	1312	423	251
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.1	3.1	0.0	0.0	35.4	38.0
Incr Delay (d2), s/veh	0.9	0.3	0.5	0.5	0.4	6.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	2.1	0.3	0.3	1.9	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.0	3.4	0.5	0.5	35.8	44.8
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		883	719		167	
Approach Delay, s/veh		3.5	0.5		42.0	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.9				73.9	16.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	61.0				61.0	17.0
Max Q Clear Time (g_c+I1), s	2.0				7.7	10.0
Green Ext Time (p_c), s	25.4				22.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.9
HCM 6th LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	1019	561	62	94	168
Future Volume (vph)	151	1019	561	62	94	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.985			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3183	0	1906	1705
Flt Permitted	0.345				0.950	
Satd. Flow (perm)	606	3274	3183	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			205
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	191	1290	710	78	119	213
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	1290	788	0	119	213
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	55.0	55.0	55.0		35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%		38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	1019	561	62	94	168
Future Volume (veh/h)	151	1019	561	62	94	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	191	1290	710	78	119	203
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	590	2594	2255	248	316	281
Arrive On Green	0.74	0.74	1.00	1.00	0.15	0.15
Sat Flow, veh/h	689	3600	3138	335	2115	1882
Grp Volume(v), veh/h	191	1290	390	398	119	203
Grp Sat Flow(s),veh/h/ln	689	1754	1678	1706	2115	1882
Q Serve(g_s), s	9.0	13.6	0.0	0.0	4.6	9.3
Cycle Q Clear(g_c), s	9.0	13.6	0.0	0.0	4.6	9.3
Prop In Lane	1.00			0.20	1.00	1.00
Lane Grp Cap(c), veh/h	590	2594	1241	1262	316	281
V/C Ratio(X)	0.32	0.50	0.31	0.32	0.38	0.72
Avail Cap(c_a), veh/h	590	2594	1241	1262	705	627
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	4.8	0.0	0.0	34.5	36.5
Incr Delay (d2), s/veh	1.5	0.7	0.7	0.7	0.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	5.9	0.4	0.4	4.3	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.7	5.5	0.7	0.7	35.3	40.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1481	788		322	
Approach Delay, s/veh		5.5	0.7		38.3	
Approach LOS		A	A		D	

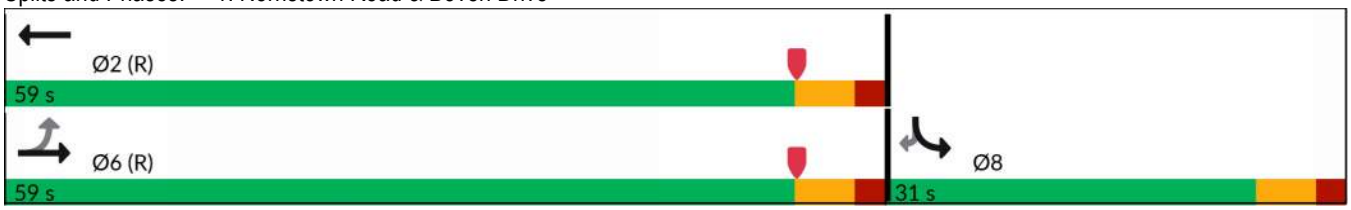
Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	71.6			71.6	18.4
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	49.0			49.0	29.0
Max Q Clear Time (g_c+I1), s	2.0			15.6	11.3
Green Ext Time (p_c), s	25.4			29.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.1
HCM 6th LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	539	536	77	79	170
Future Volume (vph)	170	539	536	77	79	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.981			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3227	0	1906	1705
Flt Permitted	0.407				0.950	
Satd. Flow (perm)	715	3306	3227	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			31			179
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	179	567	564	81	83	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	567	645	0	83	179
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	59.0	59.0	59.0		31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%		34.4%	34.4%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	539	536	77	79	170
Future Volume (veh/h)	170	539	536	77	79	170
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	179	567	564	81	83	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	675	2671	2262	324	282	251
Arrive On Green	0.76	0.76	1.00	1.00	0.13	0.13
Sat Flow, veh/h	787	3628	3083	429	2115	1882
Grp Volume(v), veh/h	179	567	321	324	83	178
Grp Sat Flow(s),veh/h/ln	787	1767	1705	1717	2115	1882
Q Serve(g_s), s	6.5	4.2	0.0	0.0	3.2	8.1
Cycle Q Clear(g_c), s	6.5	4.2	0.0	0.0	3.2	8.1
Prop In Lane	1.00			0.25	1.00	1.00
Lane Grp Cap(c), veh/h	675	2671	1288	1298	282	251
V/C Ratio(X)	0.27	0.21	0.25	0.25	0.29	0.71
Avail Cap(c_a), veh/h	675	2671	1288	1298	611	544
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.2	0.0	0.0	35.2	37.3
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.5	0.6	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	1.7	0.3	0.3	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.4	3.4	0.5	0.5	35.8	41.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		746	645		261	
Approach Delay, s/veh		3.6	0.5		39.3	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	73.0			73.0	17.0
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	53.0			53.0	25.0
Max Q Clear Time (g_c+I1), s	2.0			6.2	10.1
Green Ext Time (p_c), s	20.9			14.5	0.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.0
HCM 6th LOS	A

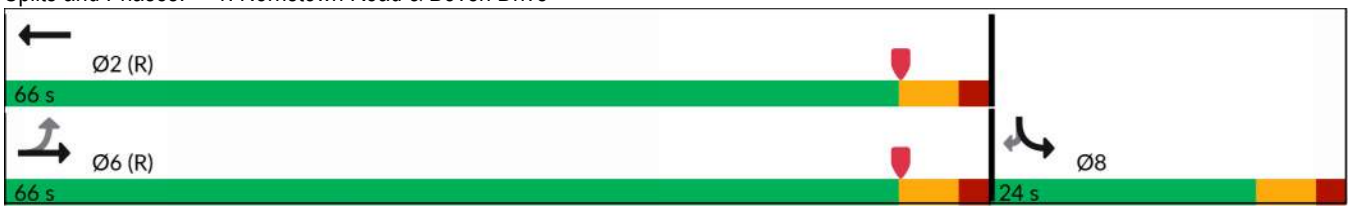
2032 Base Conditions Without SHIP Development

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	722	651	8	1	2
Future Volume (vph)	8	722	651	8	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3214	0	1906	1137
Flt Permitted	0.391				0.950	
Satd. Flow (perm)	687	3211	3214	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			2
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	8	752	678	8	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	752	686	0	1	2
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	66.0	66.0	66.0		24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%		26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	722	651	8	1	2
Future Volume (veh/h)	8	722	651	8	1	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	8	752	678	8	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	744	3026	2976	35	27	16
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.01
Sat Flow, veh/h	758	3544	3485	40	2115	1255
Grp Volume(v), veh/h	8	752	335	351	1	1
Grp Sat Flow(s),veh/h/ln	758	1727	1678	1759	2115	1255
Q Serve(g_s), s	0.1	3.1	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.1	3.1	0.0	0.0	0.0	0.1
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	744	3026	1470	1541	27	16
V/C Ratio(X)	0.01	0.25	0.23	0.23	0.04	0.06
Avail Cap(c_a), veh/h	744	3026	1470	1541	447	265
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.7	0.9	0.0	0.0	43.9	43.9
Incr Delay (d2), s/veh	0.0	0.2	0.4	0.3	0.6	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.3	0.3	0.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.1	0.4	0.3	44.4	45.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		760	686		2	
Approach Delay, s/veh		1.1	0.4		45.0	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	83.9			83.9	6.1
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	60.0			60.0	18.0
Max Q Clear Time (g_c+I1), s	2.0			5.1	2.1
Green Ext Time (p_c), s	23.7			26.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	729	1	0	663	3	2
Future Volume (vph)	729	1	0	663	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	767	1	0	698	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	768	0	0	698	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	729	1	0	663	3	2
Future Vol, veh/h	729	1	0	663	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	767	1	0	698	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	768	0	1117	384
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	988	-	*772	*1025
Stage 1	-	-	-	-	*746	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	988	-	*772	*1025
Mov Cap-2 Maneuver	-	-	-	-	*772	-
Stage 1	-	-	-	-	*746	-
Stage 2	-	-	-	-	*994	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	857	-	-	988	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	484	0	0	628	25	762	0	252	0	0	0
Future Volume (vph)	4	484	0	0	628	25	762	0	252	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.994				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5799	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5799	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					8				241			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	4	494	0	0	641	26	778	0	257	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	4	494	0	0	667	0	389	389	257	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				22.0		30.0	30.0	30.0			
Total Split (%)	14.4%				24.4%		33.3%	33.3%	33.3%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.9	54.9			19.3		25.1	25.1	25.1			
Actuated g/C Ratio	0.09	0.61			0.21		0.28	0.28	0.28			
v/c Ratio	0.03	0.26			0.53		0.87	0.87	0.42			
Control Delay (s/veh)	17.2	1.9			24.5		52.9	52.9	6.8			
Queue Delay	0.0	0.2			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	17.2	2.2			24.5		52.9	52.9	6.8			

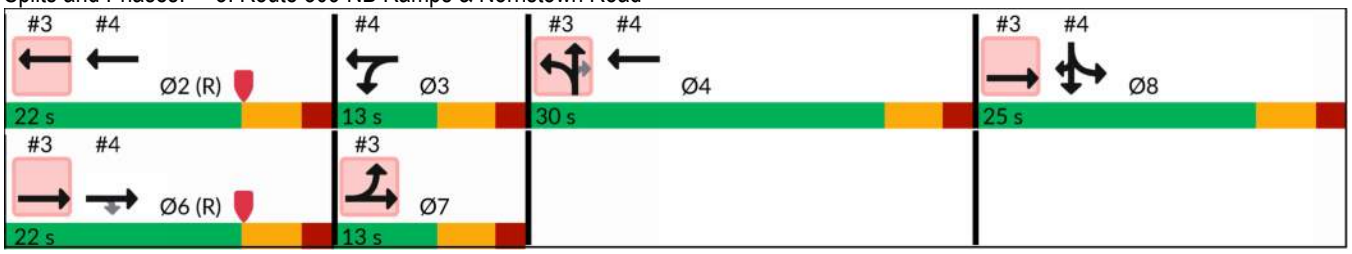
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	13.0	22.0	25.0
Total Split (%)	14%	24%	28%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		D	D	A			
Approach Delay (s/veh)		2.4			24.6			41.5				
Approach LOS		A			C			D				
Queue Length 50th (ft)	2	16			86		222	222	7			
Queue Length 95th (ft)	m6	37			110		#393	#393	64			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	116	1838			1251		446	446	598			
Starvation Cap Reductn	0	731			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.45			0.53		0.87	0.87	0.43			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 27.5 Intersection LOS: C
Intersection Capacity Utilization 92.7% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	456	534	170	1216	0	0	0	0	46	0	23
Future Volume (vph)	0	456	534	170	1216	0	0	0	0	46	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1694
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			539									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	461	539	172	1228	0	0	0	0	46	0	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	461	539	172	1228	0	0	0	0	0	46	23
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		22.0	22.0	13.0						25.0	25.0	25.0
Total Split (%)		24.4%	24.4%	14.4%						27.8%	27.8%	27.8%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		19.3	19.3	7.9	62.3						17.7	17.7
Actuated g/C Ratio		0.21	0.21	0.09	0.69						0.20	0.20
v/c Ratio		0.47	0.75	0.62	0.55						0.14	0.04
Control Delay (s/veh)		31.5	14.5	50.4	3.1						30.5	0.1
Queue Delay		0.0	0.0	0.0	2.0						0.0	0.0
Total Delay (s/veh)		31.5	14.5	50.4	5.2						30.5	0.1

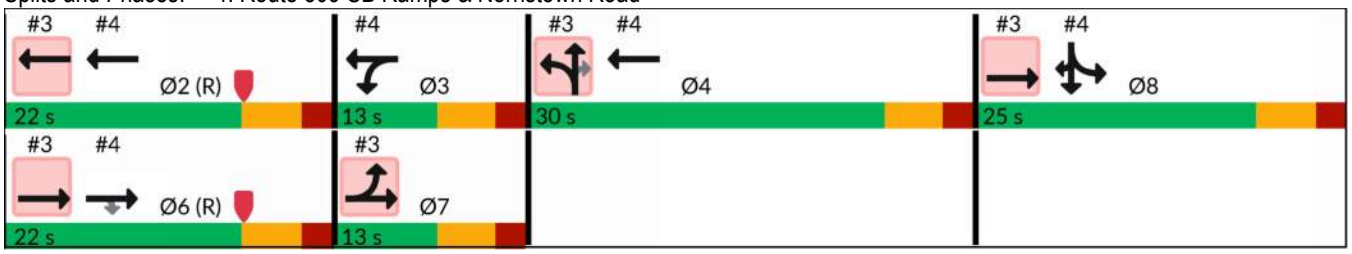
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	22.0	30.0	13.0
Total Split (%)	24%	33%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	B	D	A						C	A
Approach Delay (s/veh)		22.4			10.8						20.4	
Approach LOS		C			B						C	
Queue Length 50th (ft)		83	0	55	28						22	0
Queue Length 95th (ft)		121	#241	m75	m39						50	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		966	716	280	2180						349	523
Starvation Cap Reductn		0	0	0	764						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.48	0.75	0.61	0.87						0.13	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 15.8 Intersection LOS: B
Intersection Capacity Utilization 92.7% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

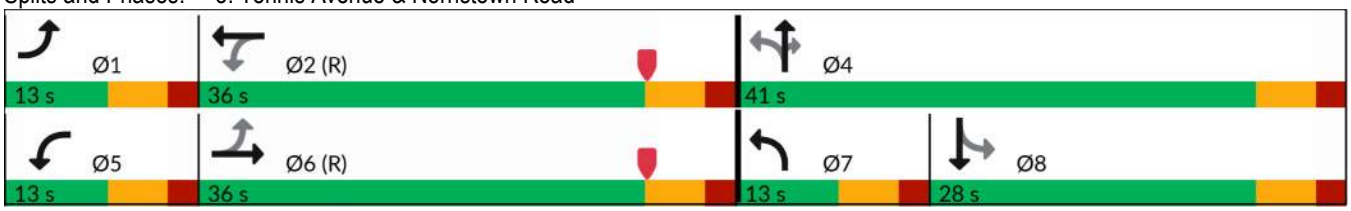
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	470	40	104	401	4	48	95	89	3	168	197
Future Volume (vph)	218	470	40	104	401	4	48	95	89	3	168	197
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.988			0.999				0.850		0.928	
Flt Protected	0.950			0.950				0.984				
Satd. Flow (prot)	1652	3223	0	1613	1759	0	0	1660	1465	0	1535	0
Flt Permitted	0.294			0.430				0.693			0.998	
Satd. Flow (perm)	511	3223	0	730	1759	0	0	1169	1465	0	1532	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		62	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	237	511	43	113	436	4	52	103	97	3	183	214
Shared Lane Traffic (%)												
Lane Group Flow (vph)	237	554	0	113	440	0	0	155	97	0	400	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	49.6	40.2		44.0	35.3			28.5	28.5		28.5	
Actuated g/C Ratio	0.55	0.45		0.49	0.39			0.32	0.32		0.32	
v/c Ratio	0.56	0.38		0.25	0.63			0.41	0.18		0.75	
Control Delay (s/veh)	20.5	9.3		12.2	28.8			26.6	3.9		32.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	20.5	9.3		12.2	28.8			26.6	3.9		32.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	A		B	C			C	A		C	
Approach Delay (s/veh)		12.7			25.4			17.9			32.4	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	28	51		28	211			68	0		171	
Queue Length 95th (ft)	#132	82		64	328			110	25		247	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	423	1441		445	690			467	651		535	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.56	0.38		0.25	0.64			0.33	0.15		0.75	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 20.8 Intersection LOS: C
Intersection Capacity Utilization 82.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

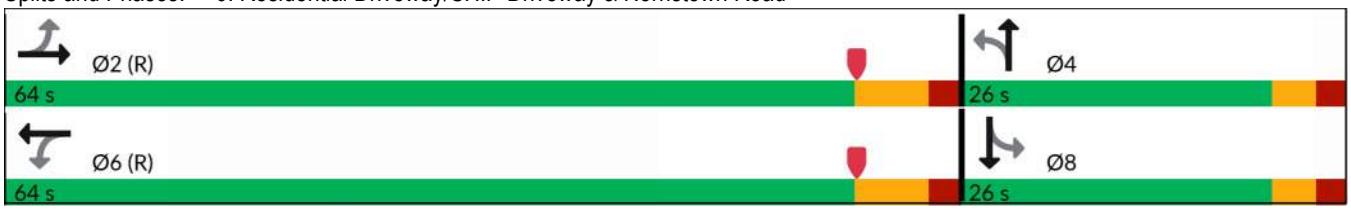
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	976	21	17	1156	10	7	0	10	7	0	5
Future Volume (vph)	27	976	21	17	1156	10	7	0	10	7	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.999			0.850			0.850	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3262	0	0	3363	0	1701	1269	0	1492	1522	0
Flt Permitted		0.892			0.931							
Satd. Flow (perm)	0	2912	0	0	3134	0	1791	1269	0	1571	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			139			94	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	28	1006	22	18	1192	10	7	0	10	7	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1056	0	0	1220	0	7	10	0	7	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	976	21	17	1156	10	7	0	10	7	0	5
Future Volume (veh/h)	27	976	21	17	1156	10	7	0	10	7	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	28	1006	21	18	1192	10	7	0	3	7	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	83	2647	55	59	3000	25	111	0	35	106	0	35
Arrive On Green	0.87	0.87	0.85	0.85	0.87	0.87	0.02	0.00	0.01	0.02	0.00	0.01
Sat Flow, veh/h	47	3057	63	21	3465	29	1359	0	1521	1208	0	1521
Grp Volume(v), veh/h	532	0	523	632	0	588	7	0	3	7	0	1
Grp Sat Flow(s),veh/h/ln	1597	0	1570	1819	0	1696	1359	0	1521	1208	0	1521
Q Serve(g_s), s	0.0	0.0	6.0	0.0	0.0	6.4	0.5	0.0	0.2	0.5	0.0	0.1
Cycle Q Clear(g_c), s	5.3	0.0	6.0	6.2	0.0	6.4	0.5	0.0	0.2	0.7	0.0	0.1
Prop In Lane	0.05		0.04	0.03		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1424	0	1360	1596	0	1468	111	0	35	106	0	35
V/C Ratio(X)	0.37	0.00	0.38	0.40	0.00	0.40	0.06	0.00	0.09	0.07	0.00	0.03
Avail Cap(c_a), veh/h	1424	0	1360	1596	0	1468	411	0	372	373	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.00	0.60	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.2	0.0	1.2	1.2	0.0	1.2	43.2	0.0	43.5	43.4	0.0	43.5
Incr Delay (d2), s/veh	0.5	0.0	0.5	0.7	0.0	0.8	0.2	0.0	1.0	0.3	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.3	0.7	0.0	0.6	0.3	0.0	0.1	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	1.6	0.0	1.7	2.0	0.0	2.1	43.5	0.0	44.5	43.6	0.0	43.8
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1055			1220			10			8	
Approach Delay, s/veh		1.7			2.0			43.8			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.2
HCM 6th LOS	A

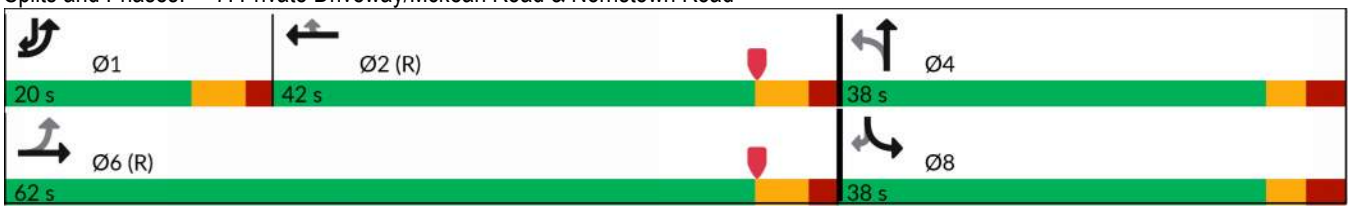
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	838	0	0	813	209	0	0	0	154	0	114
Future Volume (vph)	173	838	0	0	813	209	0	0	0	154	0	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3315	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted		0.585								0.950		
Satd. Flow (perm)	0	1955	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						235						39
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	194	942	0	0	913	235	0	0	0	173	0	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1136	0	0	913	235	0	0	0	173	0	128
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	62.0			42.0	42.0	38.0	38.0		38.0		20.0
Total Split (%)	20.0%	62.0%			42.0%	42.0%	38.0%	38.0%		38.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		72.9			61.1	61.1				17.1		28.9
Actuated g/C Ratio		0.73			0.61	0.61				0.17		0.29
v/c Ratio		0.74			0.44	0.23				0.63		0.28
Control Delay (s/veh)		11.5			11.9	2.0				48.1		19.2
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		11.5			11.9	2.0				48.1		19.2
LOS		B			B	A				D		B
Approach Delay (s/veh)		11.6			9.9						35.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		133			150	0				104		43
Queue Length 95th (ft)		216			229	32				159		81
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1516			2058	1021				529		570
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.75			0.44	0.23				0.33		0.22

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 13.7 Intersection LOS: B
Intersection Capacity Utilization 74.1% ICU Level of Service D
Analysis Period (min) 15
! Phase conflict between lane groups.

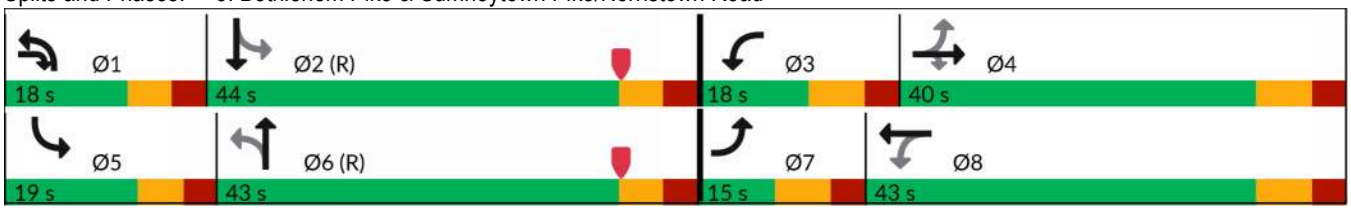
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	838	289	144	709	45	206	268	156	88	400	58
Future Volume (vph)	50	838	289	144	709	45	206	268	156	88	400	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.991			0.945			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3246	0	1528	3060	0	1588	3033	0
Flt Permitted	0.207			0.103			0.352			0.422		
Satd. Flow (perm)	341	3257	1562	181	3246	0	566	3060	0	705	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			188					101			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	54	901	311	155	762	48	222	288	168	95	430	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	901	311	155	810	0	222	456	0	95	492	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	40.0	18.0	18.0	43.0		18.0	43.0		19.0	44.0	
Total Split (%)	12.5%	33.3%	15.0%	15.0%	35.8%		15.0%	35.8%		15.8%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	838	289	144	709	45	206	268	156	88	400	58
Future Volume (veh/h)	50	838	289	144	709	45	206	268	156	88	400	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	54	901	229	155	762	48	222	288	116	95	430	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	213	945	584	229	1098	69	442	885	348	432	1087	
Arrive On Green	0.04	0.28	0.28	0.09	0.32	0.31	0.10	0.36	0.35	0.06	0.32	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3460	218	1739	2470	972	1736	3472	0
Grp Volume(v), veh/h	54	901	229	155	399	411	222	204	200	95	430	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1867	1739	1762	1680	1736	1691	0
Q Serve(g_s), s	2.7	30.9	12.9	7.0	23.1	23.2	10.0	10.1	10.5	4.3	11.9	0.0
Cycle Q Clear(g_c), s	2.7	30.9	12.9	7.0	23.1	23.2	10.0	10.1	10.5	4.3	11.9	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	213	945	584	229	575	592	442	631	602	432	1087	
V/C Ratio(X)	0.25	0.95	0.39	0.68	0.69	0.69	0.50	0.32	0.33	0.22	0.40	
Avail Cap(c_a), veh/h	250	945	584	238	575	592	442	631	602	510	1087	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.2	42.7	27.5	30.9	35.9	35.9	23.3	27.9	28.3	24.2	31.7	0.0
Incr Delay (d2), s/veh	0.6	19.0	0.4	6.5	3.3	3.2	0.9	1.4	1.5	0.3	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	21.8	8.3	6.1	15.4	15.8	7.4	7.8	7.8	3.2	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.8	61.7	27.9	37.4	39.1	39.1	24.2	29.3	29.8	24.5	32.7	0.0
LnGrp LOS	C	E	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1184			965			626			525	
Approach Delay, s/veh		53.8			38.9			27.7			31.2	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	44.6	17.4	40.0	13.6	49.0	12.4	45.1
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	10.0	32.0	12.0	36.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	12.5	14.4	9.5	33.4	6.8	12.6	5.2	25.6
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.1	1.4	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	40.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	1072	590	0	2	8
Future Volume (vph)	7	1072	590	0	2	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3225	0	1906	1705
Flt Permitted	0.368				0.950	
Satd. Flow (perm)	647	3274	3225	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						10
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	9	1357	747	0	3	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1357	747	0	3	10
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	55.0	55.0	55.0		35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%		38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	1072	590	0	2	8
Future Volume (veh/h)	7	1072	590	0	2	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	9	1357	747	0	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	707	3070	2938	0	29	25
Arrive On Green	0.88	0.88	1.00	0.00	0.01	0.00
Sat Flow, veh/h	716	3600	3533	0	2115	1882
Grp Volume(v), veh/h	9	1357	747	0	3	0
Grp Sat Flow(s),veh/h/ln	716	1754	1678	0	2115	1882
Q Serve(g_s), s	0.1	7.1	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.1	7.1	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	707	3070	2938	0	29	25
V/C Ratio(X)	0.01	0.44	0.25	0.00	0.10	0.00
Avail Cap(c_a), veh/h	707	3070	2938	0	705	627
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	1.1	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.2	0.0	1.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.4	0.2	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.6	0.2	0.0	45.4	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		1366	747		3	
Approach Delay, s/veh		1.6	0.2		45.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	83.8			83.8	6.2
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	49.0			49.0	29.0
Max Q Clear Time (g_c+I1), s	2.0			9.1	2.1
Green Ext Time (p_c), s	24.5			35.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	1.2
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1109	2	1	588	3	1
Future Volume (vph)	1109	2	1	588	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1320	2	1	700	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1322	0	0	701	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1109	2	1	588	3	1
Future Vol, veh/h	1109	2	1	588	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1320	2	1	700	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1322	0	1673	661
Stage 1	-	-	-	-	1321	-
Stage 2	-	-	-	-	352	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	646	-	*195	*896
Stage 1	-	-	-	-	*416	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	646	-	*195	*896
Mov Cap-2 Maneuver	-	-	-	-	*195	-
Stage 1	-	-	-	-	*416	-
Stage 2	-	-	-	-	*1031	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	20.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	242	-	-	646	-
HCM Lane V/C Ratio	0.02	-	-	0.002	-
HCM Control Delay (s/veh)	20.2	-	-	10.6	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	881	0	0	532	59	378	0	184	0	0	0
Future Volume (vph)	18	881	0	0	532	59	378	0	184	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.985				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5734	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5734	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					30				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	22	1074	0	0	649	72	461	0	224	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	22	1074	0	0	721	0	230	231	224	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	14.0				33.0		23.0	23.0	23.0			
Total Split (%)	15.6%				36.7%		25.6%	25.6%	25.6%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	9.0	62.0			28.0		18.0	18.0	18.0			
Actuated g/C Ratio	0.10	0.69			0.31		0.20	0.20	0.20			
v/c Ratio	0.13	0.48			0.39		0.72	0.72	0.50			
Control Delay (s/veh)	33.2	4.8			19.1		48.5	48.7	12.5			
Queue Delay	0.0	0.4			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	33.2	5.2			19.1		48.5	48.7	12.5			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		5.8			19.1			36.8				

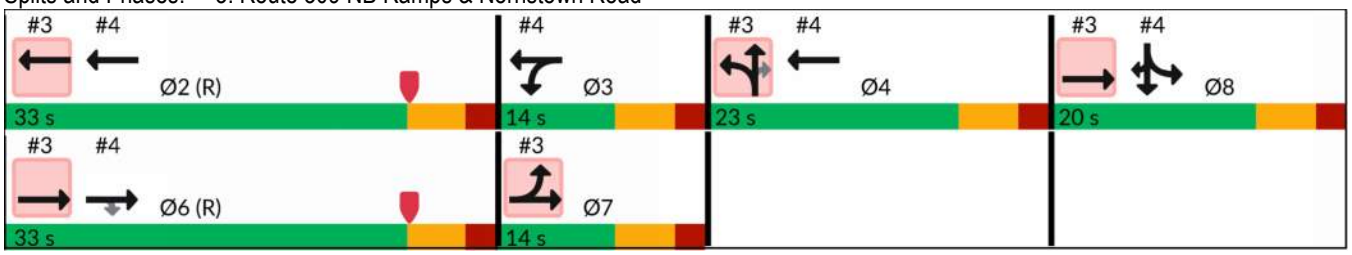
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	14.0	33.0	20.0
Total Split (%)	16%	37%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	13	50			86		129	130	20			
Queue Length 95th (ft)	33	55			46		#192	#194	66			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	164	2221			1804		317	317	441			
Starvation Cap Reductn	0	593			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.13	0.66			0.40		0.73	0.73	0.51			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 18.1 Intersection LOS: B
Intersection Capacity Utilization 103.9% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	506	876	159	855	0	0	0	0	25	2	7
Future Volume (vph)	0	506	876	159	855	0	0	0	0	25	2	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.956	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Flt Permitted				0.950							0.956	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			886									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	533	922	167	900	0	0	0	0	26	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	533	922	167	900	0	0	0	0	0	28	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		33.0	33.0	14.0						20.0	20.0	20.0
Total Split (%)		36.7%	36.7%	15.6%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		28.0	28.0	9.0	65.0						15.0	15.0
Actuated g/C Ratio		0.31	0.31	0.10	0.72						0.17	0.17
v/c Ratio		0.36	0.87	0.53	0.38						0.09	0.01
Control Delay (s/veh)		22.5	22.7	48.5	2.0						32.9	0.0
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay (s/veh)		22.5	22.7	48.5	2.4						32.9	0.0
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		22.7			9.7						26.3	

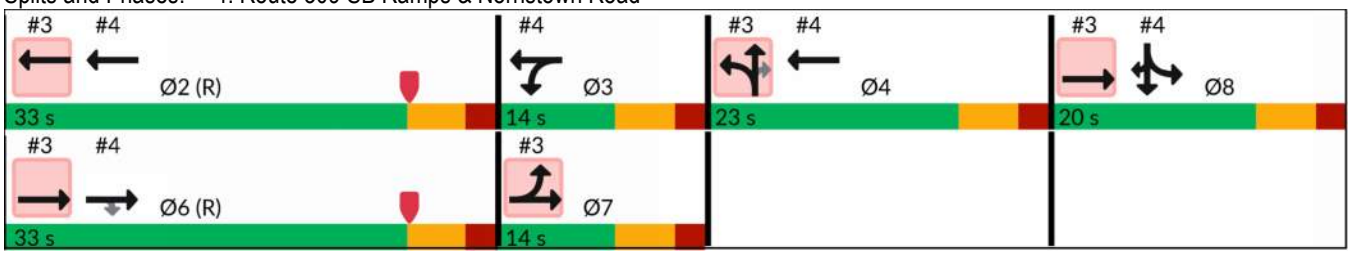
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	33.0	23.0	14.0
Total Split (%)	37%	26%	16%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A						C	
Queue Length 50th (ft)		97	323	53	12						14	0
Queue Length 95th (ft)		124	#551	m81	32						38	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1456	1048	315	2352						282	437
Starvation Cap Reductn		0	0	0	813						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.37	0.88	0.53	0.58						0.10	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 17.3 Intersection LOS: B
Intersection Capacity Utilization 103.9% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

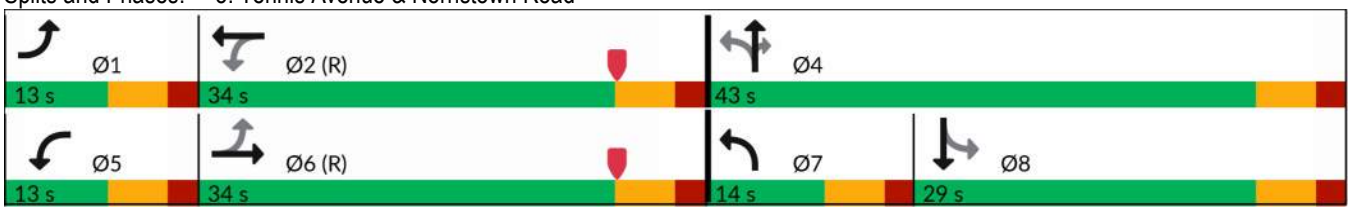
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	212	507	390	75	378	13	60	154	86	8	124	142
Future Volume (vph)	212	507	390	75	378	13	60	154	86	8	124	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935			0.995				0.850		0.930	
Flt Protected	0.950			0.950				0.986			0.999	
Satd. Flow (prot)	1652	3119	0	1693	1736	0	0	1672	1493	0	1571	0
Flt Permitted	0.310			0.218				0.691			0.988	
Satd. Flow (perm)	539	3119	0	389	1736	0	0	1172	1493	0	1554	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		59	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	238	570	438	84	425	15	67	173	97	9	139	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	1008	0	84	440	0	0	240	97	0	308	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	34.0		13.0	34.0		14.0	43.0	43.0	29.0	29.0	
Total Split (%)	14.4%	37.8%		14.4%	37.8%		15.6%	47.8%	47.8%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	55.3	44.8		46.6	38.1			24.0	24.0		24.0	
Actuated g/C Ratio	0.61	0.50		0.52	0.42			0.27	0.27		0.27	
v/c Ratio	0.48	0.64		0.26	0.59			0.76	0.20		0.67	
Control Delay (s/veh)	9.0	13.3		11.3	26.9			45.7	4.5		30.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	9.0	13.3		11.3	26.9			45.7	4.5		30.1	
LOS	A	B		B	C			D	A		C	
Approach Delay (s/veh)		12.5			24.5			33.9			30.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	21	127		17	192			125	0		126	
Queue Length 95th (ft)	76	#413		45	#365			182	25		183	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	490	1552		331	735			494	693		500	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.49	0.65		0.25	0.60			0.49	0.14		0.62	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay (s/veh): 20.3 Intersection LOS: C
Intersection Capacity Utilization 79.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

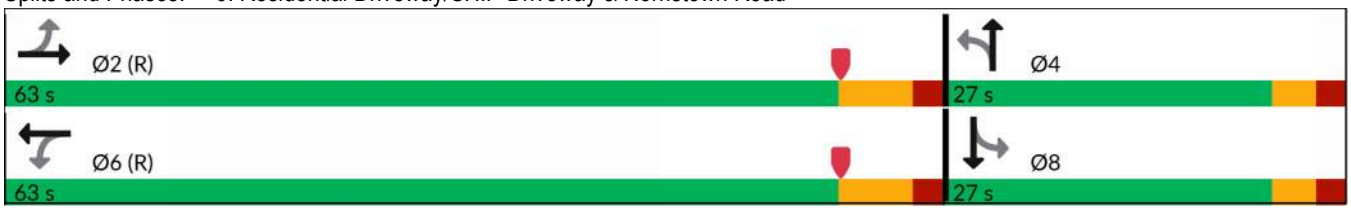
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1250	15	15	865	3	13	0	39	50	0	44
Future Volume (vph)	6	1250	15	15	865	3	13	0	39	50	0	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.850			0.850	
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1668	1492	0
Flt Permitted		0.950			0.913		0.725			0.729		
Satd. Flow (perm)	0	3192	0	0	3139	0	1298	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			1			58			148	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	7	1389	17	17	961	3	14	0	43	56	0	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1413	0	0	981	0	14	43	0	56	49	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1250	15	15	865	3	13	0	39	50	0	44
Future Volume (veh/h)	6	1250	15	15	865	3	13	0	39	50	0	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	7	1389	15	17	961	3	14	0	21	56	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	44	2690	29	61	2808	9	177	0	129	174	0	129
Arrive On Green	1.00	1.00	1.00	0.79	0.80	0.80	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	4	3344	36	25	3491	11	1336	0	1521	1314	0	1521
Grp Volume(v), veh/h	738	0	673	501	0	480	14	0	21	56	0	20
Grp Sat Flow(s),veh/h/ln	1771	0	1614	1802	0	1725	1336	0	1521	1314	0	1521
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	6.8	0.9	0.0	1.2	3.7	0.0	1.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.4	0.0	6.8	2.0	0.0	1.2	4.9	0.0	1.1
Prop In Lane	0.01		0.02	0.03		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1465	0	1298	1470	0	1387	177	0	129	174	0	129
V/C Ratio(X)	0.50	0.00	0.52	0.34	0.00	0.35	0.08	0.00	0.16	0.32	0.00	0.16
Avail Cap(c_a), veh/h	1465	0	1298	1470	0	1387	405	0	389	399	0	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.00	0.60	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	2.4	0.0	2.4	39.1	0.0	38.7	40.5	0.0	38.7
Incr Delay (d2), s/veh	0.7	0.0	0.9	0.6	0.0	0.7	0.2	0.0	0.6	1.1	0.0	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.0	0.6	2.5	0.0	2.1	0.5	0.0	0.8	2.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.7	0.0	0.9	3.0	0.0	3.1	39.3	0.0	39.3	41.6	0.0	39.2
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1411			981			35			76	
Approach Delay, s/veh		0.8			3.0			39.3			41.0	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.4	11.6	78.4	11.6
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	56.0	22.0	56.0	22.0
Max Q Clear Time (g_c+I1), s	0.0	4.0	0.0	6.9
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.4
HCM 6th LOS	A

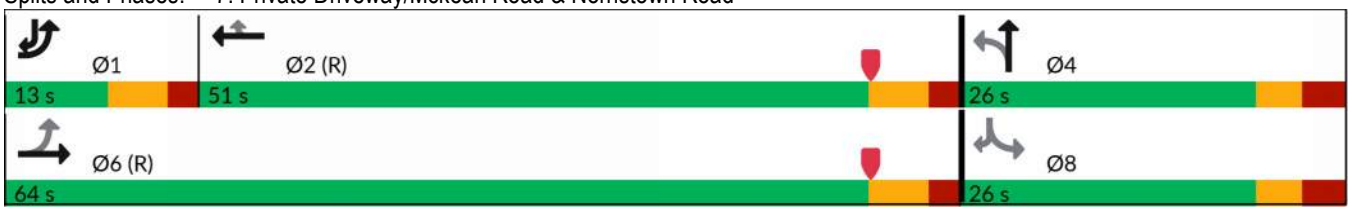
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	985	0	0	802	117	0	0	0	232	0	181
Future Volume (vph)	105	985	0	0	802	117	0	0	0	232	0	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	3356	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted		0.697								0.757		
Satd. Flow (perm)	0	2351	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						124						120
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	112	1048	0	0	853	124	0	0	0	247	0	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1160	0	0	853	124	0	0	0	247	0	193
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	64.0			51.0	51.0	26.0	26.0		26.0		13.0
Total Split (%)	14.4%	71.1%			56.7%	56.7%	28.9%	28.9%		28.9%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		60.0			48.2	48.2				20.0		31.8
Actuated g/C Ratio		0.67			0.54	0.54				0.22		0.35
v/c Ratio		0.70			0.46	0.14				0.86		0.31
Control Delay (s/veh)		11.6			9.3	2.9				61.9		9.7
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		11.6			9.3	2.9				61.9		9.7
LOS		B			A	A				E		A
Approach Delay (s/veh)		11.7			8.6						39.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		162			123	10				134		27
Queue Length 95th (ft)		210			130	21				#262		75
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1641			1822	881				301		625
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.71			0.47	0.14				0.82		0.31

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay (s/veh): 15.2 Intersection LOS: B
Intersection Capacity Utilization 80.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road

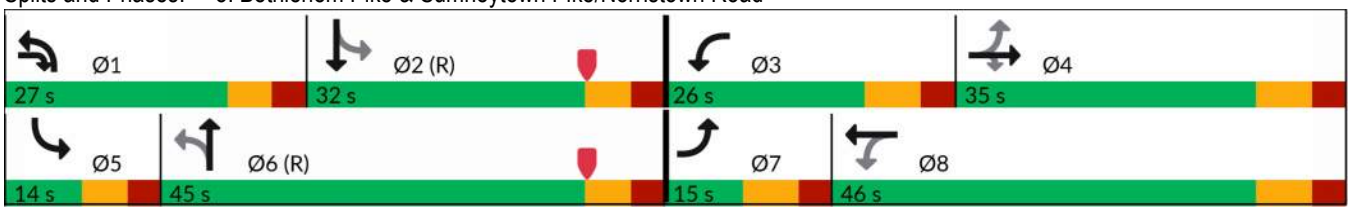


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	773	197	204	735	81	228	485	186	157	427	43
Future Volume (vph)	61	773	197	204	735	81	228	485	186	157	427	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.985			0.958			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3255	0	1604	3183	0	1604	3135	0
Flt Permitted	0.231			0.107			0.254			0.301		
Satd. Flow (perm)	396	3290	1603	190	3255	0	429	3183	0	508	3135	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					49			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	64	814	207	215	774	85	240	511	196	165	449	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	814	207	215	859	0	240	707	0	165	494	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	35.0	27.0	26.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	29.2%	22.5%	21.7%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	773	197	204	735	81	228	485	186	157	427	43
Future Volume (veh/h)	61	773	197	204	735	81	228	485	186	157	427	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	64	814	155	215	774	85	240	511	159	165	449	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	199	808	561	272	983	108	478	1000	310	345	1106	
Arrive On Green	0.05	0.23	0.23	0.11	0.30	0.29	0.12	0.37	0.36	0.07	0.32	0.00
Sat Flow, veh/h	1723	3464	1605	1856	3315	364	1807	2710	839	1750	3555	0
Grp Volume(v), veh/h	64	814	155	215	426	433	240	339	331	165	449	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1605	1856	1825	1855	1807	1803	1747	1750	1732	0
Q Serve(g_s), s	3.3	28.0	8.3	9.9	25.7	25.7	10.0	17.5	17.8	7.7	12.2	0.0
Cycle Q Clear(g_c), s	3.3	28.0	8.3	9.9	25.7	25.7	10.0	17.5	17.8	7.7	12.2	0.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.48	1.00		0.00
Lane Grp Cap(c), veh/h	199	808	561	272	541	550	478	665	644	345	1106	
V/C Ratio(X)	0.32	1.01	0.28	0.79	0.79	0.79	0.50	0.51	0.51	0.48	0.41	
Avail Cap(c_a), veh/h	226	808	561	354	593	603	584	665	644	345	1106	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.4	46.0	28.1	30.9	38.7	38.8	21.7	29.4	29.7	25.7	31.9	0.0
Incr Delay (d2), s/veh	0.9	33.4	0.3	7.9	5.8	5.7	0.8	2.8	2.9	1.0	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	22.1	5.7	8.3	17.3	17.6	7.6	12.5	12.4	5.8	8.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.3	79.4	28.4	38.8	44.5	44.6	22.5	32.2	32.6	26.7	33.1	0.0
LnGrp LOS	C	F	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1033			1074			910			614	
Approach Delay, s/veh		69.0			43.4			29.8			31.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	44.3	20.7	35.0	14.0	50.3	13.1	42.6
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	18.0	27.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	12.5	14.7	12.4	30.5	10.2	20.0	5.8	28.2
Green Ext Time (p_c), s	0.5	1.3	0.3	0.0	0.0	2.3	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	45.2
HCM 6th LOS	D

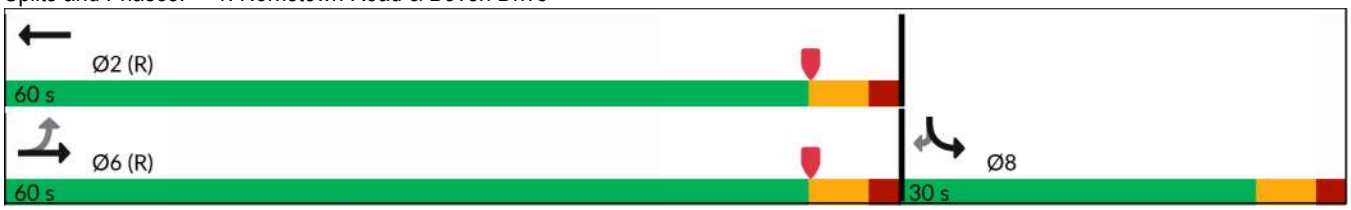
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	573	569	1	2	1
Future Volume (vph)	2	573	569	1	2	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3289	0	1906	1705
Flt Permitted	0.425				0.950	
Satd. Flow (perm)	747	3306	3289	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	603	599	1	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	603	600	0	2	1
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	60.0	60.0	60.0		30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%		33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	573	569	1	2	1
Future Volume (veh/h)	2	573	569	1	2	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	2	603	599	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	799	3097	3060	5	27	24
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.00
Sat Flow, veh/h	821	3628	3582	6	2115	1882
Grp Volume(v), veh/h	2	603	292	308	2	0
Grp Sat Flow(s),veh/h/ln	821	1767	1705	1793	2115	1882
Q Serve(g_s), s	0.0	2.3	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.0	2.3	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	799	3097	1494	1571	27	24
V/C Ratio(X)	0.00	0.19	0.20	0.20	0.07	0.00
Avail Cap(c_a), veh/h	799	3097	1494	1571	588	523
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.3	1.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.2	0.2	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.0	0.3	0.3	45.1	0.0
LnGrp LOS	A	A	A	A	D	
Approach Vol, veh/h		605	600		2	
Approach Delay, s/veh		1.0	0.3		45.1	
Approach LOS		A	A		D	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	83.9	83.9	6.1
Change Period (Y+Rc), s	6.0	6.0	6.0
Max Green Setting (Gmax), s	54.0	54.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	4.3	2.1
Green Ext Time (p_c), s	19.1	19.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.7
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	583	2	1	571	1	2
Future Volume (vph)	583	2	1	571	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	614	2	1	601	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	616	0	0	602	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	583	2	1	571	1	2
Future Vol, veh/h	583	2	1	571	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	614	2	1	601	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	616	0	918	308
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1074	-	*840	*1076
Stage 1	-	-	-	-	*828	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1074	-	*839	*1076
Mov Cap-2 Maneuver	-	-	-	-	*839	-
Stage 1	-	-	-	-	*828	-
Stage 2	-	-	-	-	*1033	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	983	-	-	1074	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.7	-	-	8.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	433	0	0	513	39	347	0	173	0	0	0
Future Volume (vph)	5	433	0	0	513	39	347	0	173	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.989				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5890	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5890	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					19				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	5	451	0	0	534	41	361	0	180	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	5	451	0	0	575	0	180	181	180	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		18.0	18.0	18.0			
Total Split (%)	14.4%				37.8%		20.0%	20.0%	20.0%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.6	66.6			33.4		13.4	13.4	13.4			
Actuated g/C Ratio	0.08	0.74			0.37		0.15	0.15	0.15			
v/c Ratio	0.03	0.18			0.26		0.75	0.75	0.47			
Control Delay (s/veh)	30.6	1.0			22.8		57.7	58.0	10.0			
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	30.6	1.2			22.8		57.7	58.0	10.0			
LOS	C	A			C		E	E	B			
Approach Delay (s/veh)		1.5			22.8			42.0				

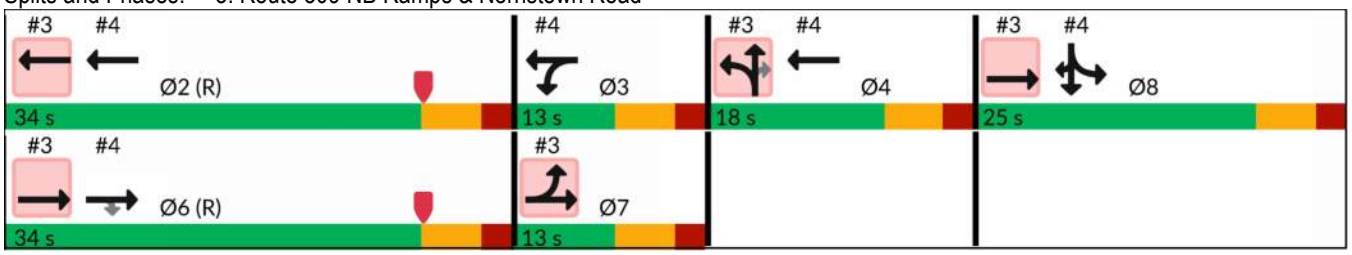
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	25.0
Total Split (%)	14%	38%	28%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			D				
Queue Length 50th (ft)	3	0			71		105	106	0			
Queue Length 95th (ft)	m13	13			89		#215	#216	56			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2403			2198		240	240	381			
Starvation Cap Reductn	0	1114			0		0	0	0			
Spillback Cap Reductn	0	0			40		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.35			0.27		0.75	0.75	0.47			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 23.2 Intersection LOS: C
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	375	363	91	823	0	0	0	0	41	0	11
Future Volume (vph)	0	375	363	91	823	0	0	0	0	41	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			390									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	403	390	98	885	0	0	0	0	44	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	403	390	98	885	0	0	0	0	0	44	12
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						25.0	25.0	25.0
Total Split (%)		37.8%	37.8%	14.4%						27.8%	27.8%	27.8%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		33.4	33.4	7.6	64.4						15.6	15.6
Actuated g/C Ratio		0.37	0.37	0.08	0.72						0.17	0.17
v/c Ratio		0.23	0.50	0.36	0.38						0.15	0.02
Control Delay (s/veh)		18.9	7.5	48.7	3.2						32.6	0.0
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		18.9	7.5	48.7	3.7						32.6	0.0
LOS		B	A	D	A						C	A
Approach Delay (s/veh)		13.3			8.2						25.7	

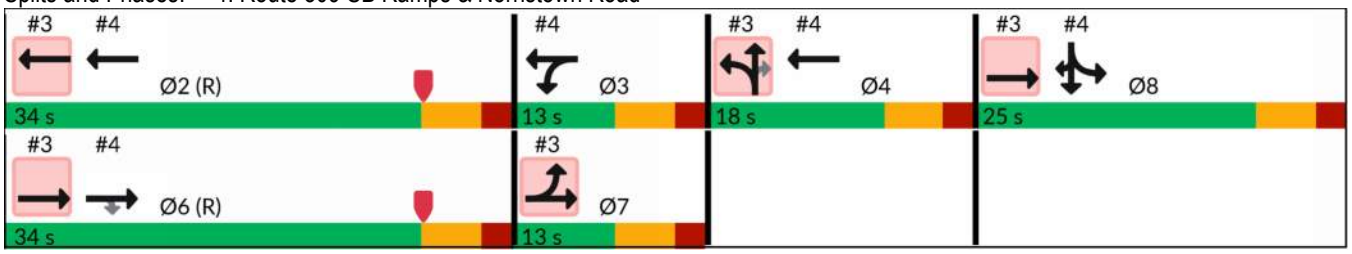
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	18.0	13.0
Total Split (%)	38%	20%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		56	0	31	14						22	0
Queue Length 95th (ft)		84	131	m51	47						50	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1703	767	280	2251						376	523
Starvation Cap Reductn		0	0	0	819						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.24	0.51	0.35	0.62						0.12	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 11.0 Intersection LOS: B
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	423	38	55	394	5	54	84	60	8	84	104
Future Volume (vph)	129	423	38	55	394	5	54	84	60	8	84	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.998				0.850		0.928	
Flt Protected	0.950			0.950				0.981			0.998	
Satd. Flow (prot)	1701	3331	0	1710	1796	0	0	1696	1553	0	1580	0
Flt Permitted	0.423			0.476				0.596			0.986	
Satd. Flow (perm)	758	3331	0	857	1796	0	0	1030	1553	0	1561	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		60	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	136	445	40	58	415	5	57	88	63	8	88	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	485	0	58	420	0	0	145	63	0	205	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	37.0		13.0	37.0		13.0	40.0	40.0	27.0	27.0	
Total Split (%)	14.4%	41.1%		14.4%	41.1%		14.4%	44.4%	44.4%	30.0%	30.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	61.5	53.9		57.7	50.2			15.9	15.9		15.9	
Actuated g/C Ratio	0.68	0.60		0.64	0.56			0.18	0.18		0.18	
v/c Ratio	0.22	0.24		0.09	0.41			0.80	0.17		0.63	
Control Delay (s/veh)	3.1	4.0		5.5	14.5			65.0	2.5		32.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	3.1	4.0		5.5	14.5			65.0	2.5		32.2	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		3.9			13.4			46.1			32.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	6	19		8	128			80	0		76	
Queue Length 95th (ft)	24	36		24	247			137	10		137	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	613	1995		633	1002			400	670		426	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.22	0.24		0.09	0.42			0.36	0.09		0.48	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay (s/veh): 16.5 Intersection LOS: B
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15

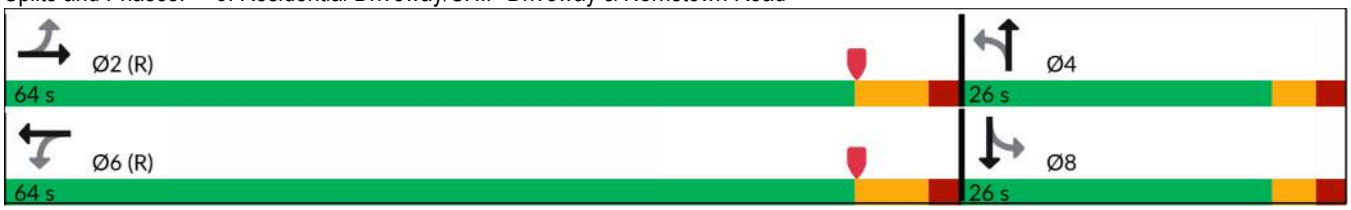
Splits and Phases: 5: Tennis Avenue & Norristown Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	737	15	20	741	0	8	0	14	7	0	0
Future Volume (vph)	0	737	15	20	741	0	8	0	14	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99							
Frt		0.997						0.850				
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1701	1791	0
Flt Permitted					0.924							
Satd. Flow (perm)	0	3360	0	0	3177	0	1791	1522	0	1791	1791	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5						230				
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	768	16	21	772	0	8	0	15	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	784	0	0	793	0	8	15	0	7	0	0
Turn Type		NA		Perm	NA		Perm	NA		Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	737	15	20	741	0	8	0	14	7	0	0
Future Volume (veh/h)	0	737	15	20	741	0	8	0	14	7	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	0	768	16	21	772	0	8	0	4	7	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	0	2932	61	86	2942	0	112	0	36	109	43	0
Arrive On Green	0.00	0.87	0.85	0.85	0.87	0.00	0.02	0.00	0.01	0.02	0.00	0.00
Sat Flow, veh/h	0	3477	71	51	3487	0	1360	0	1521	1355	1794	0
Grp Volume(v), veh/h	0	383	401	417	376	0	8	0	4	7	0	0
Grp Sat Flow(s),veh/h/ln	0	1691	1768	1811	1640	0	1360	0	1521	1355	1794	0
Q Serve(g_s), s	0.0	3.6	3.6	0.0	3.6	0.0	0.5	0.0	0.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.6	3.6	3.4	3.6	0.0	0.5	0.0	0.2	0.7	0.0	0.0
Prop In Lane	0.00		0.04	0.05		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1463	1529	1588	1419	0	112	0	36	109	43	0
V/C Ratio(X)	0.00	0.26	0.26	0.26	0.27	0.00	0.07	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	0	1463	1529	1588	1419	0	412	0	372	408	439	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.1	1.1	1.1	1.1	0.0	43.1	0.0	43.5	43.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	0.4	0.5	0.0	0.3	0.0	1.3	0.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.3	0.3	0.4	0.3	0.0	0.3	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	1.5	1.5	1.5	1.5	0.0	43.4	0.0	44.8	43.6	0.0	0.0
LnGrp LOS		A	A	A	A		D		D	D		
Approach Vol, veh/h		784			793			12			7	
Approach Delay, s/veh		1.5			1.5			43.9			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.0
HCM 6th LOS	A

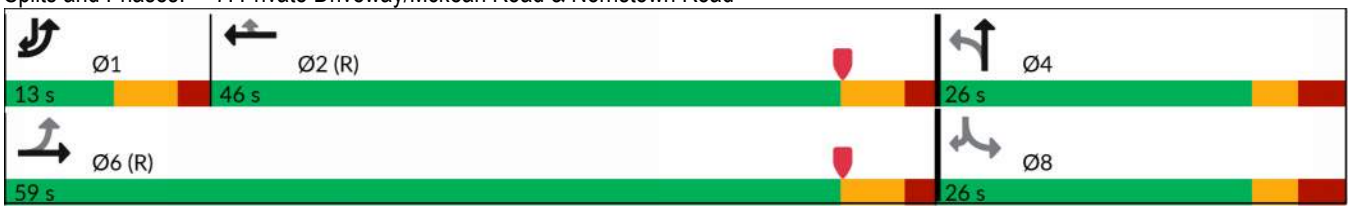
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	535	0	0	532	70	0	0	0	91	0	111
Future Volume (vph)	102	535	0	0	532	70	0	0	0	91	0	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3348	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted		0.761								0.757		
Satd. Flow (perm)	0	2568	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						121
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	111	582	0	0	578	76	0	0	0	99	0	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	693	0	0	578	76	0	0	0	99	0	121
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	59.0			46.0	46.0	26.0	26.0		26.0		13.0
Total Split (%)	15.3%	69.4%			54.1%	54.1%	30.6%	30.6%		30.6%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		65.7			56.4	56.4				12.9		21.9
Actuated g/C Ratio		0.77			0.66	0.66				0.15		0.26
v/c Ratio		0.34			0.25	0.07				0.50		0.25
Control Delay (s/veh)		4.5			8.6	0.9				41.2		5.4
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		4.5			8.6	0.9				41.2		5.4
LOS		A			A	A				D		A
Approach Delay (s/veh)		4.6			7.8						21.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						C	
Queue Length 50th (ft)		53			72	0				49		0
Queue Length 95th (ft)		96			120	9				91		34
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		2033			2237	1059				318		498
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.34			0.26	0.07				0.31		0.24

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay (s/veh): 8.3 Intersection LOS: A
Intersection Capacity Utilization 51.2% ICU Level of Service A
Analysis Period (min) 15

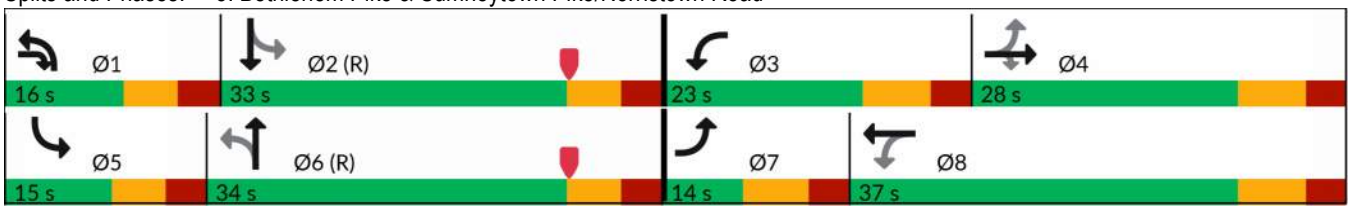
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	406	177	119	416	96	167	440	111	158	437	65
Future Volume (vph)	58	406	177	119	416	96	167	440	111	158	437	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.972			0.970			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3251	0	1558	3229	0	1604	3147	0
Flt Permitted	0.416			0.302			0.340			0.322		
Satd. Flow (perm)	693	3290	1624	536	3251	0	557	3229	0	544	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			218					31			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	62	437	190	128	447	103	180	473	119	170	470	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	437	190	128	550	0	180	592	0	170	540	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	14.0	28.0	16.0	23.0	37.0		16.0	34.0		15.0	33.0	
Total Split (%)	14.0%	28.0%	16.0%	23.0%	37.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	406	177	119	416	96	167	440	111	158	437	65
Future Volume (veh/h)	58	406	177	119	416	96	167	440	111	158	437	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	62	437	149	128	447	99	180	473	105	170	470	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	216	581	420	285	605	133	507	1153	254	457	1359	
Arrive On Green	0.06	0.17	0.17	0.09	0.20	0.19	0.09	0.39	0.38	0.09	0.39	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2996	659	1767	2936	648	1750	3583	0
Grp Volume(v), veh/h	62	437	149	128	273	273	180	289	289	170	470	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1816	1767	1803	1781	1750	1745	0
Q Serve(g_s), s	3.0	12.0	7.6	5.5	13.9	14.1	5.9	11.6	11.8	5.6	9.5	0.0
Cycle Q Clear(g_c), s	3.0	12.0	7.6	5.5	13.9	14.1	5.9	11.6	11.8	5.6	9.5	0.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.36	1.00		0.00
Lane Grp Cap(c), veh/h	216	581	420	285	371	367	507	708	700	457	1359	
V/C Ratio(X)	0.29	0.75	0.36	0.45	0.73	0.74	0.36	0.41	0.41	0.37	0.35	
Avail Cap(c_a), veh/h	241	727	488	416	551	545	518	708	700	457	1359	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.0	39.6	30.1	30.5	37.4	37.6	15.4	22.0	22.1	15.8	21.5	0.0
Incr Delay (d2), s/veh	0.7	3.4	0.5	1.1	2.8	3.0	0.4	1.7	1.8	0.5	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	9.1	5.1	4.4	10.3	10.4	4.1	8.7	8.7	3.9	6.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.7	43.1	30.6	31.5	40.2	40.6	15.9	23.7	23.9	16.3	22.2	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	B	C	
Approach Vol, veh/h		648			674			758			640	
Approach Delay, s/veh		39.2			38.7			21.9			20.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	44.9	15.9	23.8	15.0	45.3	12.5	27.2
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	15.0	20.0	8.0	27.0	6.0	29.0
Max Q Clear Time (g_c+I1), s	8.4	12.0	8.0	14.5	8.1	14.1	5.5	16.4
Green Ext Time (p_c), s	0.0	1.6	0.2	1.2	0.0	1.7	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	29.9
HCM 6th LOS	C

Notes

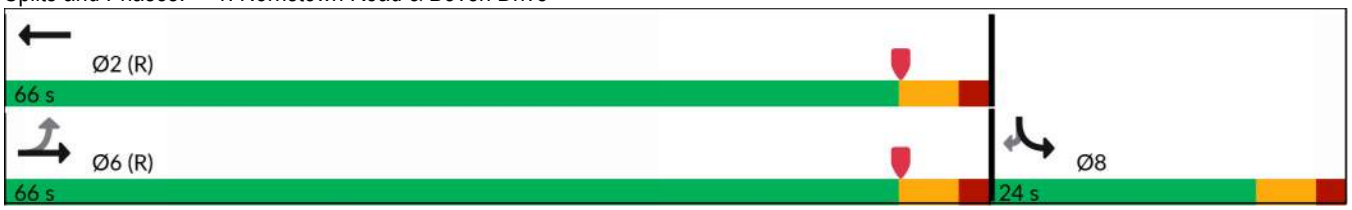
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2032 Projected Conditions Without SHIP Development

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	707	638	59	50	111
Future Volume (vph)	147	707	638	59	50	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.987			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3154	0	1906	1137
Flt Permitted	0.376				0.950	
Satd. Flow (perm)	661	3211	3154	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			24			116
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	153	736	665	61	52	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	736	726	0	52	116
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	66.0	66.0	66.0		24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%		26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	707	638	59	50	111
Future Volume (veh/h)	147	707	638	59	50	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	153	736	665	61	52	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	638	2642	2378	218	262	156
Arrive On Green	0.76	0.76	1.00	1.00	0.12	0.12
Sat Flow, veh/h	730	3544	3197	285	2115	1255
Grp Volume(v), veh/h	153	736	359	367	52	115
Grp Sat Flow(s),veh/h/ln	730	1727	1678	1715	2115	1255
Q Serve(g_s), s	5.6	5.7	0.0	0.0	2.0	8.0
Cycle Q Clear(g_c), s	5.6	5.7	0.0	0.0	2.0	8.0
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	638	2642	1284	1312	262	156
V/C Ratio(X)	0.24	0.28	0.28	0.28	0.20	0.74
Avail Cap(c_a), veh/h	638	2642	1284	1312	447	265
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.1	3.2	0.0	0.0	35.4	38.0
Incr Delay (d2), s/veh	0.9	0.3	0.5	0.5	0.4	6.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	2.1	0.3	0.3	1.9	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.0	3.4	0.5	0.5	35.8	44.7
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		889	726		167	
Approach Delay, s/veh		3.5	0.5		41.9	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.8				73.8	16.2
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	60.0				60.0	18.0
Max Q Clear Time (g_c+I1), s	2.0				7.7	10.0
Green Ext Time (p_c), s	25.6				22.6	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.9
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	763	1	0	701	3	2
Future Volume (vph)	763	1	0	701	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	803	1	0	738	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	804	0	0	738	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	763	1	0	701	3	2
Future Vol, veh/h	763	1	0	701	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	803	1	0	738	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	804	0	1173	402
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	981	-	*705	*999
Stage 1	-	-	-	-	*749	-
Stage 2	-	-	-	-	*953	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	981	-	*705	*999
Mov Cap-2 Maneuver	-	-	-	-	*705	-
Stage 1	-	-	-	-	*749	-
Stage 2	-	-	-	-	*953	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	799	-	-	981	-
HCM Lane V/C Ratio	0.007	-	-	-	-
HCM Control Delay (s/veh)	9.5	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	583	0	0	721	28	762	0	277	0	0	0
Future Volume (vph)	4	583	0	0	721	28	762	0	277	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.994				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5800	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5800	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					7				266			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	4	595	0	0	736	29	778	0	283	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	4	595	0	0	765	0	389	389	283	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				22.0		30.0	30.0	30.0			
Total Split (%)	14.4%				24.4%		33.3%	33.3%	33.3%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	8.0	55.0			18.4		25.0	25.0	25.0			
Actuated g/C Ratio	0.09	0.61			0.20		0.28	0.28	0.28			
v/c Ratio	0.03	0.31			0.64		0.87	0.87	0.46			
Control Delay (s/veh)	15.5	2.5			25.5		53.3	53.3	6.9			
Queue Delay	0.0	0.5			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	15.5	3.0			25.5		53.3	53.3	6.9			

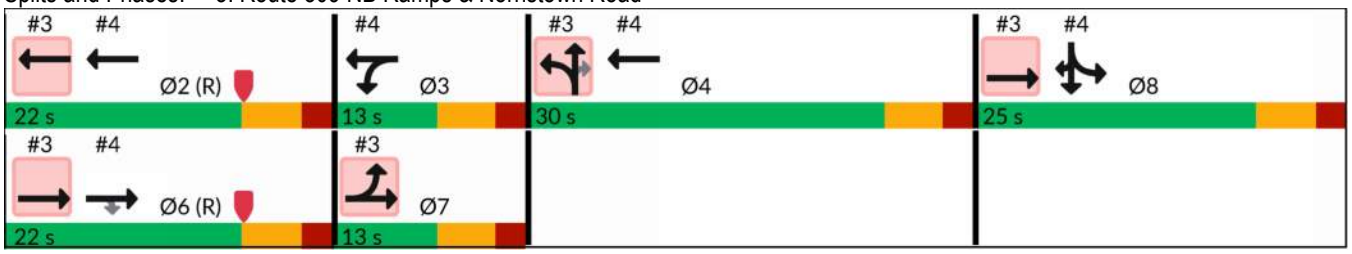
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	13.0	22.0	25.0
Total Split (%)	14%	24%	28%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		D	D	A			
Approach Delay (s/veh)		3.1			25.5			40.9				
Approach LOS		A			C			D				
Queue Length 50th (ft)	2	36			98		222	222	7			
Queue Length 95th (ft)	m4	54			93		#393	#393	67			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	116	1839			1188		445	445	615			
Starvation Cap Reductn	0	784			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.56			0.64		0.87	0.87	0.46			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 26.7 Intersection LOS: C
Intersection Capacity Utilization 92.7% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	551	534	190	1289	0	0	0	0	50	0	23
Future Volume (vph)	0	551	534	190	1289	0	0	0	0	50	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1694
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			539									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	557	539	192	1302	0	0	0	0	51	0	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	557	539	192	1302	0	0	0	0	0	51	23
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		22.0	22.0	13.0						25.0	25.0	25.0
Total Split (%)		24.4%	24.4%	14.4%						27.8%	27.8%	27.8%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		18.4	18.4	8.0	61.4						18.6	18.6
Actuated g/C Ratio		0.20	0.20	0.09	0.68						0.21	0.21
v/c Ratio		0.60	0.76	0.68	0.59						0.15	0.04
Control Delay (s/veh)		34.2	14.7	50.1	3.4						29.9	0.1
Queue Delay		0.0	0.0	0.0	5.3						0.0	0.0
Total Delay (s/veh)		34.2	14.7	50.1	8.8						29.9	0.1

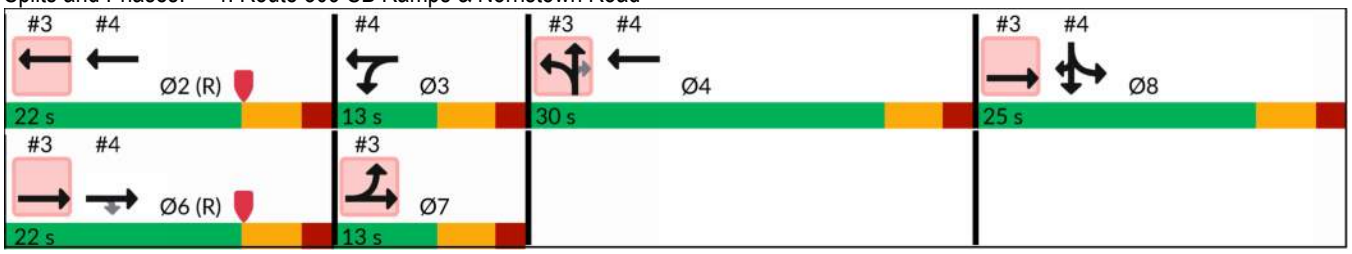
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	22.0	30.0	13.0
Total Split (%)	24%	33%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	B	D	A						C	A
Approach Delay (s/veh)		24.7			14.1						20.7	
Approach LOS		C			B						C	
Queue Length 50th (ft)		108	0	61	56						24	0
Queue Length 95th (ft)		146	#242	m82	m45						54	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		918	707	280	2143						349	523
Starvation Cap Reductn		0	0	0	769						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.61	0.76	0.69	0.95						0.15	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 18.7 Intersection LOS: B
Intersection Capacity Utilization 92.7% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

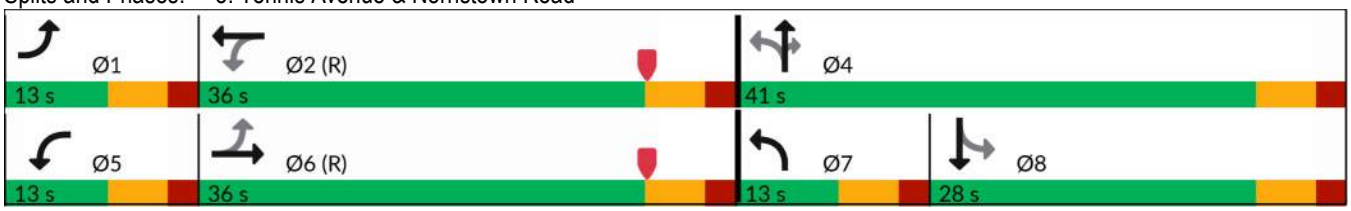
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	486	49	104	419	4	58	95	89	3	168	207
Future Volume (vph)	227	486	49	104	419	4	58	95	89	3	168	207
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.986			0.999				0.850		0.926	
Flt Protected	0.950			0.950				0.981				
Satd. Flow (prot)	1652	3215	0	1613	1759	0	0	1654	1465	0	1532	0
Flt Permitted	0.261			0.412				0.639			0.998	
Satd. Flow (perm)	454	3215	0	699	1759	0	0	1077	1465	0	1529	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		65	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	247	528	53	113	455	4	63	103	97	3	183	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	581	0	113	459	0	0	166	97	0	411	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	48.7	39.3		42.8	34.1			29.4	29.4		29.4	
Actuated g/C Ratio	0.54	0.44		0.48	0.38			0.33	0.33		0.33	
v/c Ratio	0.61	0.41		0.26	0.68			0.47	0.17		0.75	
Control Delay (s/veh)	24.9	10.2		12.7	31.3			27.8	3.9		31.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	24.9	10.2		12.7	31.3			27.8	3.9		31.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	B		B	C			C	A		C	
Approach Delay (s/veh)		14.7			27.7			19.0			31.6	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	54	61		29	228			74	0		174	
Queue Length 95th (ft)	#121	93		64	#354			120	25		256	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	399	1403		424	666			430	651		547	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.62	0.41		0.27	0.69			0.39	0.15		0.75	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 22.2 Intersection LOS: C
Intersection Capacity Utilization 85.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

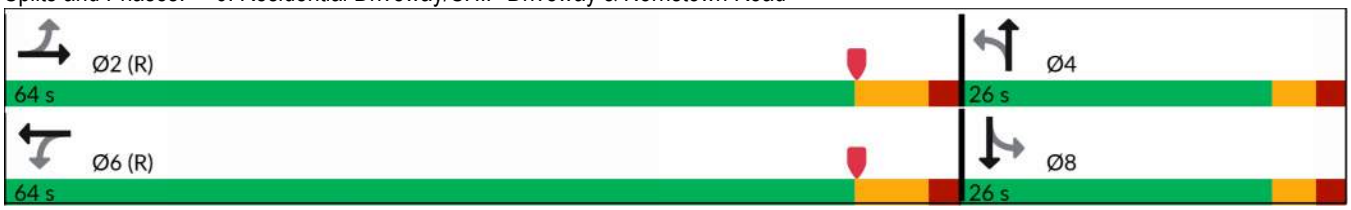
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1071	21	17	1229	10	7	0	10	7	0	5
Future Volume (vph)	27	1071	21	17	1229	10	7	0	10	7	0	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.999			0.850			0.850	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3261	0	0	3363	0	1701	1269	0	1492	1522	0
Flt Permitted		0.891			0.929							
Satd. Flow (perm)	0	2909	0	0	3127	0	1791	1269	0	1571	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2			113			80	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	28	1104	22	18	1267	10	7	0	10	7	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1154	0	0	1295	0	7	10	0	7	5	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1071	21	17	1229	10	7	0	10	7	0	5
Future Volume (veh/h)	27	1071	21	17	1229	10	7	0	10	7	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	28	1104	21	18	1267	10	7	0	3	7	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	77	2663	50	58	3000	24	111	0	35	106	0	35
Arrive On Green	0.87	0.87	0.85	0.85	0.87	0.87	0.02	0.00	0.01	0.02	0.00	0.01
Sat Flow, veh/h	41	3076	58	20	3465	27	1359	0	1521	1208	0	1521
Grp Volume(v), veh/h	583	0	570	671	0	624	7	0	3	7	0	1
Grp Sat Flow(s),veh/h/ln	1603	0	1571	1816	0	1696	1359	0	1521	1208	0	1521
Q Serve(g_s), s	0.0	0.0	6.9	0.0	0.0	7.0	0.5	0.0	0.2	0.5	0.0	0.1
Cycle Q Clear(g_c), s	6.1	0.0	6.9	6.8	0.0	7.0	0.5	0.0	0.2	0.7	0.0	0.1
Prop In Lane	0.05		0.04	0.03		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1430	0	1360	1593	0	1468	111	0	35	106	0	35
V/C Ratio(X)	0.41	0.00	0.42	0.42	0.00	0.43	0.06	0.00	0.09	0.07	0.00	0.03
Avail Cap(c_a), veh/h	1430	0	1360	1593	0	1468	411	0	372	373	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.49	0.00	0.49	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.2	0.0	1.3	1.3	0.0	1.3	43.2	0.0	43.5	43.4	0.0	43.5
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.8	0.0	0.9	0.2	0.0	1.0	0.3	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.3	0.8	0.0	0.7	0.3	0.0	0.1	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	1.6	0.0	1.7	2.1	0.0	2.2	43.5	0.0	44.5	43.6	0.0	43.8
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1153			1295			10			8	
Approach Delay, s/veh		1.7			2.1			43.8			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.2
HCM 6th LOS	A

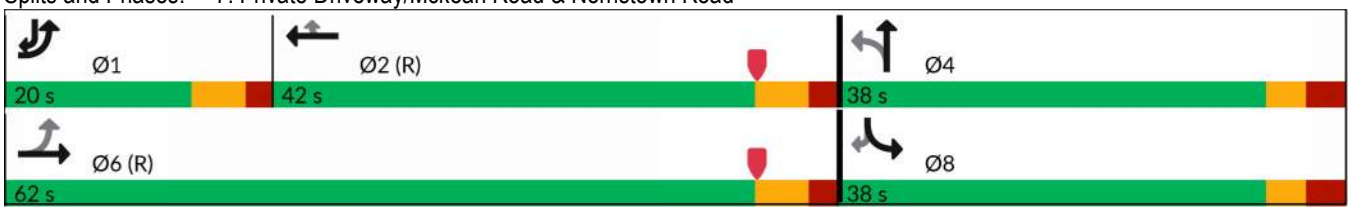
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	922	0	0	878	217	0	0	0	165	0	114
Future Volume (vph)	173	922	0	0	878	217	0	0	0	165	0	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	3315	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted		0.573								0.950		
Satd. Flow (perm)	0	1915	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						244						33
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	194	1036	0	0	987	244	0	0	0	185	0	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1230	0	0	987	244	0	0	0	185	0	128
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	62.0			42.0	42.0	38.0	38.0		38.0		20.0
Total Split (%)	20.0%	62.0%			42.0%	42.0%	38.0%	38.0%		38.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		72.1			60.3	60.3				17.9		29.7
Actuated g/C Ratio		0.72			0.60	0.60				0.18		0.30
v/c Ratio		0.83			0.48	0.24				0.64		0.27
Control Delay (s/veh)		15.8			12.9	2.1				47.9		20.0
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		15.8			12.9	2.1				47.9		20.0
LOS		B			B	A				D		C
Approach Delay (s/veh)		15.9			10.8						36.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B						D	
Queue Length 50th (ft)		156			172	0				111		45
Queue Length 95th (ft)		#276			260	33				167		83
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1477			2031	1014				529		577
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.83			0.49	0.24				0.35		0.22

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 16.0 Intersection LOS: B
Intersection Capacity Utilization 79.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

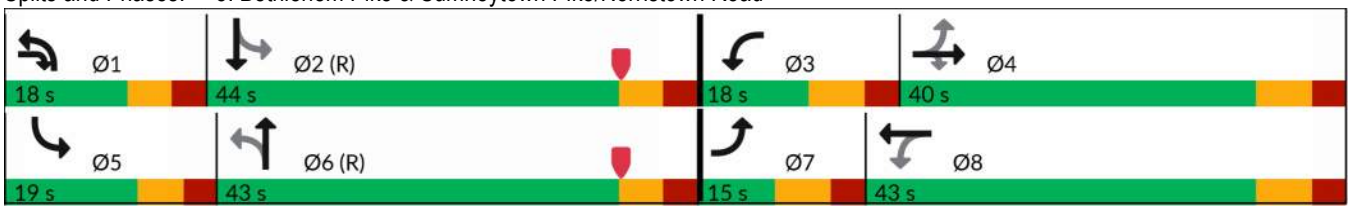
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	869	289	167	734	62	206	268	186	111	400	58
Future Volume (vph)	50	869	289	167	734	62	206	268	186	111	400	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.988			0.939			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3237	0	1528	3042	0	1588	3033	0
Flt Permitted	0.181			0.103			0.360			0.383		
Satd. Flow (perm)	299	3257	1562	181	3237	0	579	3042	0	640	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			180					152			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	54	934	311	180	789	67	222	288	200	119	430	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	934	311	180	856	0	222	488	0	119	492	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	40.0	18.0	18.0	43.0		18.0	43.0		19.0	44.0	
Total Split (%)	12.5%	33.3%	15.0%	15.0%	35.8%		15.0%	35.8%		15.8%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	869	289	167	734	62	206	268	186	111	400	58
Future Volume (veh/h)	50	869	289	167	734	62	206	268	186	111	400	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	54	934	229	180	789	67	222	288	148	119	430	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	204	945	584	231	1088	92	437	780	390	419	1071	
Arrive On Green	0.04	0.28	0.28	0.09	0.32	0.31	0.10	0.34	0.33	0.07	0.32	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3379	287	1739	2274	1138	1736	3472	0
Grp Volume(v), veh/h	54	934	229	180	423	433	222	221	215	119	430	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1855	1739	1762	1650	1736	1691	0
Q Serve(g_s), s	2.7	32.5	12.9	8.1	24.8	24.8	10.2	11.3	11.9	5.4	11.9	0.0
Cycle Q Clear(g_c), s	2.7	32.5	12.9	8.1	24.8	24.8	10.2	11.3	11.9	5.4	11.9	0.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.69	1.00		0.00
Lane Grp Cap(c), veh/h	204	945	584	231	583	597	437	604	566	419	1071	
V/C Ratio(X)	0.26	0.99	0.39	0.78	0.73	0.73	0.51	0.37	0.38	0.28	0.40	
Avail Cap(c_a), veh/h	241	945	584	231	583	597	437	604	566	479	1071	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.4	43.3	27.5	30.7	36.0	36.1	24.2	29.6	30.1	24.3	32.1	0.0
Incr Delay (d2), s/veh	0.7	26.3	0.4	13.8	4.0	3.9	1.0	1.7	1.9	0.4	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	23.7	8.3	7.5	16.3	16.6	7.6	8.7	8.6	4.0	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.0	69.6	27.9	44.6	40.0	40.0	25.1	31.3	32.0	24.6	33.2	0.0
LnGrp LOS	C	E	C	D	D	D	C	C	C	C	C	
Approach Vol, veh/h		1217			1036			658			549	
Approach Delay, s/veh		60.1			40.8			29.5			31.4	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	44.0	18.0	40.0	14.8	47.2	12.4	45.6
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	10.0	32.0	12.0	36.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	12.7	14.4	10.6	35.0	7.9	13.9	5.2	27.3
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.1	1.5	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	43.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	1028	566	62	94	168
Future Volume (vph)	151	1028	566	62	94	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.985			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3183	0	1906	1705
Flt Permitted	0.343				0.950	
Satd. Flow (perm)	603	3274	3183	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			202
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	191	1301	716	78	119	213
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	1301	794	0	119	213
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	55.0	55.0	55.0		35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%		38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	1028	566	62	94	168
Future Volume (veh/h)	151	1028	566	62	94	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	191	1301	716	78	119	203
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	587	2594	2258	246	316	281
Arrive On Green	0.74	0.74	1.00	1.00	0.15	0.15
Sat Flow, veh/h	685	3600	3141	332	2115	1882
Grp Volume(v), veh/h	191	1301	393	401	119	203
Grp Sat Flow(s),veh/h/ln	685	1754	1678	1707	2115	1882
Q Serve(g_s), s	9.1	13.8	0.0	0.0	4.6	9.3
Cycle Q Clear(g_c), s	9.1	13.8	0.0	0.0	4.6	9.3
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	587	2594	1241	1262	316	281
V/C Ratio(X)	0.33	0.50	0.32	0.32	0.38	0.72
Avail Cap(c_a), veh/h	587	2594	1241	1262	705	627
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	4.8	0.0	0.0	34.5	36.5
Incr Delay (d2), s/veh	1.5	0.7	0.7	0.7	0.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	5.9	0.4	0.4	4.3	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.7	5.5	0.7	0.7	35.3	40.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1492	794		322	
Approach Delay, s/veh		5.6	0.7		38.3	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	71.6				71.6	18.4
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	49.0				49.0	29.0
Max Q Clear Time (g_c+I1), s	2.0				15.8	11.3
Green Ext Time (p_c), s	25.6				29.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.1
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	2	1	626	3	1
Future Volume (vph)	1157	2	1	626	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1377	2	1	745	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1379	0	0	746	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1157	2	1	626	3	1
Future Vol, veh/h	1157	2	1	626	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1377	2	1	745	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1379	0	1753	690
Stage 1	-	-	-	-	1378	-
Stage 2	-	-	-	-	375	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	608	-	*179	*896
Stage 1	-	-	-	-	*379	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	608	-	*179	*896
Mov Cap-2 Maneuver	-	-	-	-	*179	-
Stage 1	-	-	-	-	*379	-
Stage 2	-	-	-	-	*991	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	21.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	224	-	-	608	-
HCM Lane V/C Ratio	0.021	-	-	0.002	-
HCM Control Delay (s/veh)	21.4	-	-	10.9	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	961	0	0	664	63	378	0	204	0	0	0
Future Volume (vph)	18	961	0	0	664	63	378	0	204	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.987				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5748	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5748	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					25				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	22	1172	0	0	810	77	461	0	249	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	22	1172	0	0	887	0	230	231	249	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	14.0				33.0		23.0	23.0	23.0			
Total Split (%)	15.6%				36.7%		25.6%	25.6%	25.6%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	9.0	62.0			28.0		18.0	18.0	18.0			
Actuated g/C Ratio	0.10	0.69			0.31		0.20	0.20	0.20			
v/c Ratio	0.13	0.52			0.49		0.72	0.72	0.56			
Control Delay (s/veh)	32.4	5.2			17.8		48.5	48.7	15.4			
Queue Delay	0.0	0.5			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	32.4	5.8			17.8		48.5	48.7	15.4			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		6.3			17.8			37.0				

Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	14.0	33.0	20.0
Total Split (%)	16%	37%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

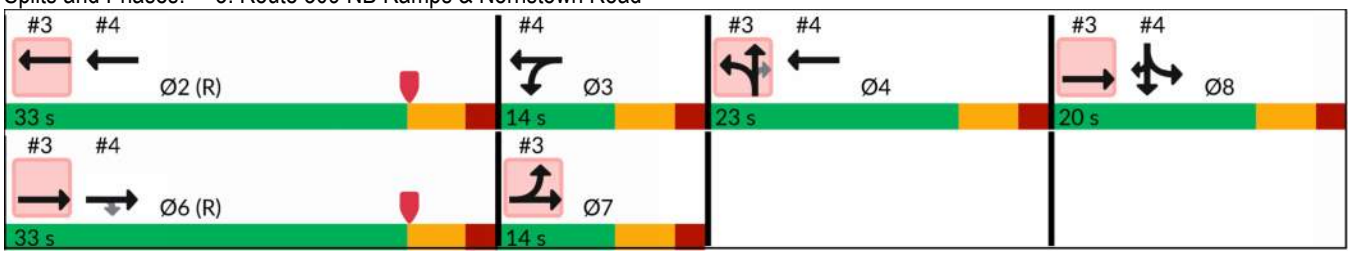
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	13	72			81		129	130	32			
Queue Length 95th (ft)	m32	56			82		#192	#194	84			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	164	2221			1805		317	317	441			
Starvation Cap Reductn	0	587			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.13	0.72			0.49		0.73	0.73	0.56			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay (s/veh): 17.8 Intersection LOS: B
Intersection Capacity Utilization 105.3% ICU Level of Service G
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	583	876	187	959	0	0	0	0	28	2	7
Future Volume (vph)	0	583	876	187	959	0	0	0	0	28	2	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.955	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1690	1717
Flt Permitted				0.950							0.955	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1690	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			877									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	614	922	197	1009	0	0	0	0	29	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	614	922	197	1009	0	0	0	0	0	31	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		33.0	33.0	14.0						20.0	20.0	20.0
Total Split (%)		36.7%	36.7%	15.6%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		28.0	28.0	9.0	65.0						15.0	15.0
Actuated g/C Ratio		0.31	0.31	0.10	0.72						0.17	0.17
v/c Ratio		0.42	0.88	0.62	0.42						0.11	0.01
Control Delay (s/veh)		22.6	22.8	47.5	2.0						33.1	0.0
Queue Delay		0.0	0.0	0.0	0.5						0.0	0.0
Total Delay (s/veh)		22.6	22.8	47.5	2.5						33.1	0.0
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		22.8			9.9						27.0	

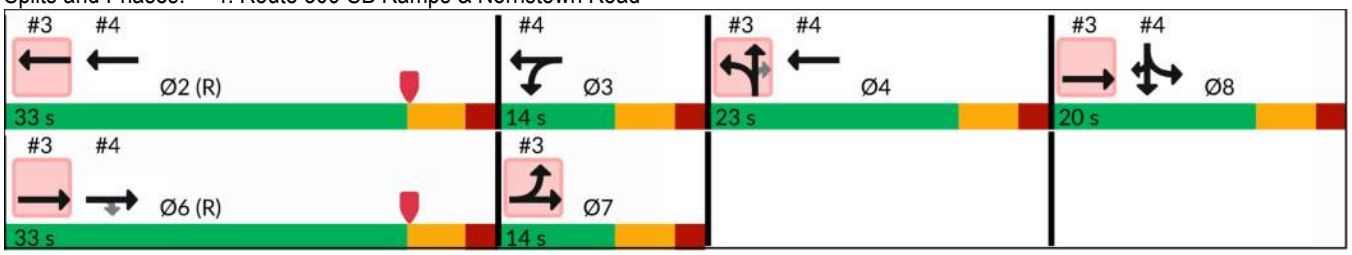
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	33.0	23.0	14.0
Total Split (%)	37%	26%	16%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A						C	
Queue Length 50th (ft)		113	324	63	15						15	0
Queue Length 95th (ft)		137	#557	m94	31						40	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1456	1041	315	2352						281	437
Starvation Cap Reductn		0	0	0	822						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.42	0.89	0.63	0.66						0.11	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay (s/veh): 17.2 Intersection LOS: B
Intersection Capacity Utilization 105.3% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

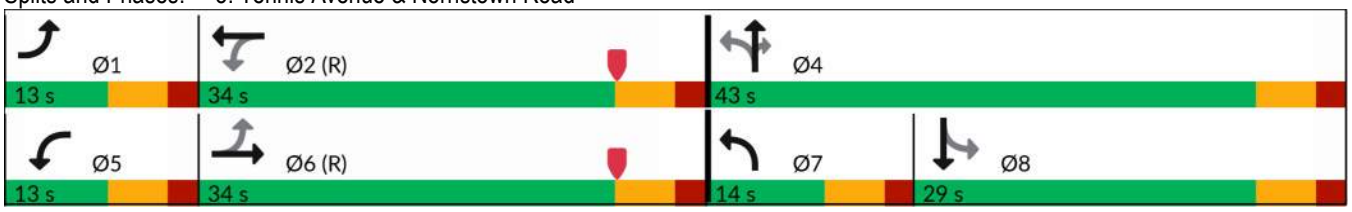
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	527	404	75	396	13	70	154	86	8	124	152
Future Volume (vph)	226	527	404	75	396	13	70	154	86	8	124	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935			0.995				0.850		0.928	
Flt Protected	0.950			0.950				0.985			0.999	
Satd. Flow (prot)	1652	3119	0	1693	1736	0	0	1672	1493	0	1568	0
Flt Permitted	0.258			0.193				0.687			0.989	
Satd. Flow (perm)	449	3119	0	344	1736	0	0	1166	1493	0	1552	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		63	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	254	592	454	84	445	15	79	173	97	9	139	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	254	1046	0	84	460	0	0	252	97	0	319	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	34.0		13.0	34.0		14.0	43.0	43.0	29.0	29.0	
Total Split (%)	14.4%	37.8%		14.4%	37.8%		15.6%	47.8%	47.8%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	52.0	42.1		42.7	34.5			27.0	27.0		27.0	
Actuated g/C Ratio	0.58	0.47		0.47	0.38			0.30	0.30		0.30	
v/c Ratio	0.57	0.71		0.29	0.69			0.72	0.18		0.62	
Control Delay (s/veh)	15.6	16.8		13.6	32.1			39.0	3.9		25.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	15.6	16.8		13.6	32.1			39.0	3.9		25.9	
LOS	B	B		B	C			D	A		C	
Approach Delay (s/veh)		16.6			29.3			29.3			26.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	27	158		19	228			127	0		124	
Queue Length 95th (ft)	#160	#456		50	#392			178	23		175	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	440	1458		293	665			492	693		538	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.58	0.72		0.29	0.69			0.51	0.14		0.59	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay (s/veh): 22.3 Intersection LOS: C
Intersection Capacity Utilization 82.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

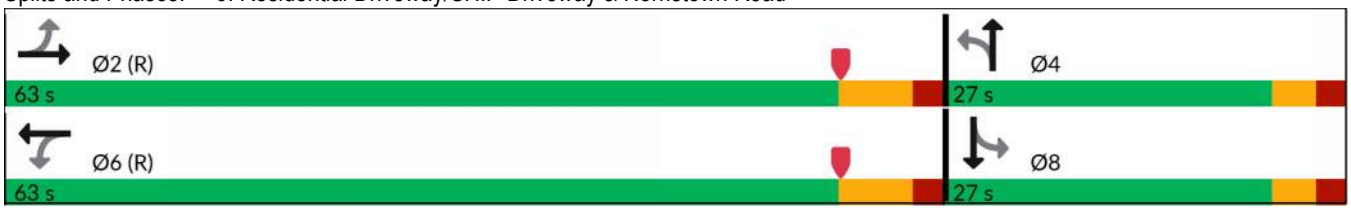
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1327	15	15	969	3	13	0	39	50	0	44
Future Volume (vph)	6	1327	15	15	969	3	13	0	39	50	0	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.850			0.850	
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1668	1492	0
Flt Permitted		0.950			0.914		0.725			0.729		
Satd. Flow (perm)	0	3192	0	0	3142	0	1298	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			48			115	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	7	1474	17	17	1077	3	14	0	43	56	0	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1498	0	0	1097	0	14	43	0	56	49	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1327	15	15	969	3	13	0	39	50	0	44
Future Volume (veh/h)	6	1327	15	15	969	3	13	0	39	50	0	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	7	1474	15	17	1077	3	14	0	21	56	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	44	2691	27	58	2818	8	177	0	129	174	0	129
Arrive On Green	1.00	1.00	1.00	0.79	0.80	0.80	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	4	3346	34	21	3503	10	1336	0	1521	1314	0	1521
Grp Volume(v), veh/h	783	0	713	562	0	535	14	0	21	56	0	20
Grp Sat Flow(s),veh/h/ln	1770	0	1614	1809	0	1725	1336	0	1521	1314	0	1521
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	7.9	0.9	0.0	1.2	3.7	0.0	1.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.5	0.0	7.9	2.0	0.0	1.2	4.9	0.0	1.1
Prop In Lane	0.01		0.02	0.03		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1464	0	1298	1476	0	1387	177	0	129	174	0	129
V/C Ratio(X)	0.53	0.00	0.55	0.38	0.00	0.39	0.08	0.00	0.16	0.32	0.00	0.16
Avail Cap(c_a), veh/h	1464	0	1298	1476	0	1387	405	0	389	399	0	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.51	0.00	0.51	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	2.5	0.0	2.5	39.1	0.0	38.7	40.5	0.0	38.7
Incr Delay (d2), s/veh	0.7	0.0	0.9	0.7	0.0	0.8	0.2	0.0	0.6	1.1	0.0	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.0	0.6	2.9	0.0	2.4	0.5	0.0	0.8	2.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.7	0.0	0.9	3.2	0.0	3.3	39.3	0.0	39.3	41.6	0.0	39.2
LnGrp LOS	A		A	A		A	D		D	D		D
Approach Vol, veh/h		1496			1097			35			76	
Approach Delay, s/veh		0.8			3.3			39.3			41.0	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.4	11.6	78.4	11.6
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	56.0	22.0	56.0	22.0
Max Q Clear Time (g_c+I1), s	0.0	4.0	0.0	6.9
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.4
HCM 6th LOS	A

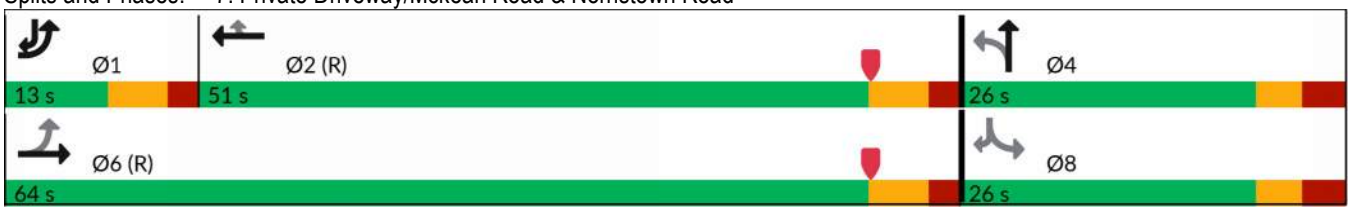
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1053	0	0	894	129	0	0	0	241	0	181
Future Volume (vph)	105	1053	0	0	894	129	0	0	0	241	0	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	3355	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted		0.672								0.757		
Satd. Flow (perm)	0	2266	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						137						92
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	112	1120	0	0	951	137	0	0	0	256	0	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1232	0	0	951	137	0	0	0	256	0	193
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	64.0			51.0	51.0	26.0	26.0		26.0		13.0
Total Split (%)	14.4%	71.1%			56.7%	56.7%	28.9%	28.9%		28.9%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		59.8			47.9	47.9				20.2		32.1
Actuated g/C Ratio		0.66			0.53	0.53				0.22		0.36
v/c Ratio		0.77			0.52	0.15				0.88		0.32
Control Delay (s/veh)		13.8			9.4	2.5				65.1		12.3
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		13.8			9.4	2.5				65.1		12.3
LOS		B			A	A				E		B
Approach Delay (s/veh)		13.8			8.6						42.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (ft)		177			123	9				140		39
Queue Length 95th (ft)		230			144	18				#274		89
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1587			1811	882				301		611
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.78			0.53	0.16				0.85		0.32

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 16.4 Intersection LOS: B
Intersection Capacity Utilization 85.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



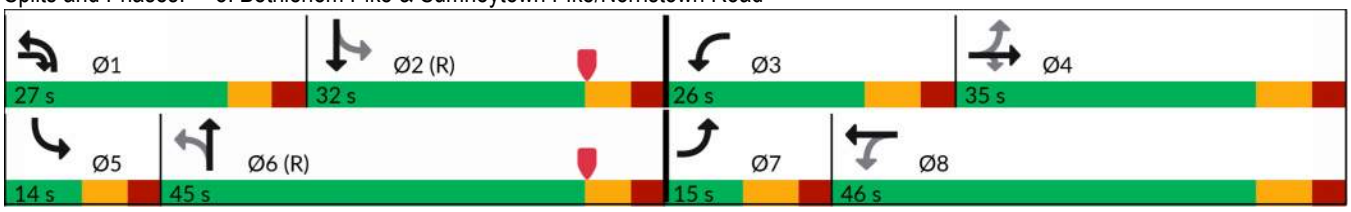
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	797	197	237	769	106	228	485	211	176	427	43
Future Volume (vph)	61	797	197	237	769	106	228	485	211	176	427	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.982			0.955			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3245	0	1604	3173	0	1604	3135	0
Flt Permitted	0.201			0.104			0.254			0.280		
Satd. Flow (perm)	345	3290	1603	185	3245	0	429	3173	0	473	3135	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					60			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	64	839	207	249	809	112	240	511	222	185	449	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	839	207	249	921	0	240	733	0	185	494	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	35.0	27.0	26.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	29.2%	22.5%	21.7%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	797	197	237	769	106	228	485	211	176	427	43
Future Volume (veh/h)	61	797	197	237	769	106	228	485	211	176	427	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	64	839	155	249	809	112	240	511	185	185	449	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	195	808	565	300	1002	139	464	920	331	321	1048	
Arrive On Green	0.05	0.23	0.23	0.13	0.31	0.30	0.12	0.35	0.35	0.07	0.30	0.00
Sat Flow, veh/h	1723	3464	1605	1856	3219	446	1807	2597	935	1750	3555	0
Grp Volume(v), veh/h	64	839	155	249	459	462	240	354	342	185	449	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1605	1856	1825	1840	1807	1803	1729	1750	1732	0
Q Serve(g_s), s	3.3	28.0	8.3	11.7	27.7	27.8	10.3	18.9	19.2	8.0	12.5	0.0
Cycle Q Clear(g_c), s	3.3	28.0	8.3	11.7	27.7	27.8	10.3	18.9	19.2	8.0	12.5	0.0
Prop In Lane	1.00		1.00	1.00		0.24	1.00		0.54	1.00		0.00
Lane Grp Cap(c), veh/h	195	808	565	300	568	573	464	639	613	321	1048	
V/C Ratio(X)	0.33	1.04	0.27	0.83	0.81	0.81	0.52	0.55	0.56	0.58	0.43	
Avail Cap(c_a), veh/h	222	808	565	354	593	598	566	639	613	321	1048	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.5	46.0	27.9	31.4	38.0	38.1	22.8	31.1	31.4	28.8	33.5	0.0
Incr Delay (d2), s/veh	1.0	41.9	0.3	11.8	6.8	6.8	0.9	3.4	3.6	2.5	1.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	23.7	5.6	9.7	18.4	18.6	7.8	13.4	13.2	7.0	9.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.5	87.9	28.2	43.1	44.8	44.9	23.7	34.6	35.1	31.3	34.8	0.0
LnGrp LOS	C	F	C	D	D	D	C	C	D	C	C	
Approach Vol, veh/h		1058			1170			936			634	
Approach Delay, s/veh		76.0			44.5			32.0			33.8	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	42.3	22.5	35.0	14.0	48.5	13.1	44.4
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	18.0	27.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	12.8	15.0	14.2	30.5	10.5	21.4	5.8	30.2
Green Ext Time (p_c), s	0.5	1.3	0.3	0.0	0.0	2.4	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	48.4
HCM 6th LOS	D

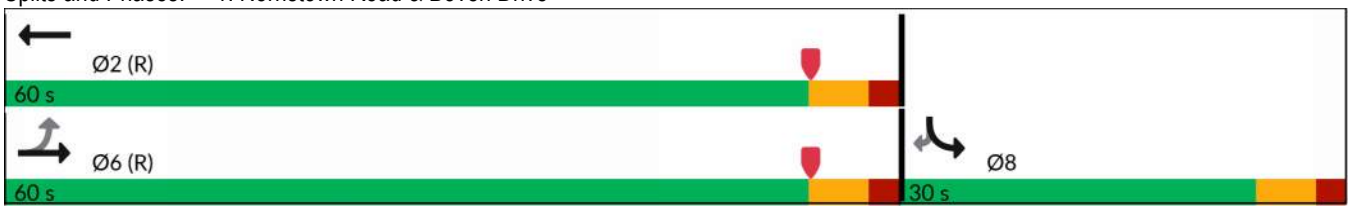
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	544	541	77	79	170
Future Volume (vph)	170	544	541	77	79	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.981			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3227	0	1906	1705
Flt Permitted	0.405				0.950	
Satd. Flow (perm)	712	3306	3227	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			32			179
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	179	573	569	81	83	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	573	650	0	83	179
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	60.0	60.0	60.0		30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%		33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	544	541	77	79	170
Future Volume (veh/h)	170	544	541	77	79	170
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	179	573	569	81	83	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	672	2672	2265	322	281	250
Arrive On Green	0.76	0.76	1.00	1.00	0.13	0.13
Sat Flow, veh/h	783	3628	3087	426	2115	1882
Grp Volume(v), veh/h	179	573	323	327	83	178
Grp Sat Flow(s),veh/h/ln	783	1767	1705	1718	2115	1882
Q Serve(g_s), s	6.5	4.3	0.0	0.0	3.2	8.2
Cycle Q Clear(g_c), s	6.5	4.3	0.0	0.0	3.2	8.2
Prop In Lane	1.00			0.25	1.00	1.00
Lane Grp Cap(c), veh/h	672	2672	1289	1298	281	250
V/C Ratio(X)	0.27	0.21	0.25	0.25	0.29	0.71
Avail Cap(c_a), veh/h	672	2672	1289	1298	588	523
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.2	0.0	0.0	35.2	37.4
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.5	0.6	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	1.7	0.3	0.3	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.4	3.4	0.5	0.5	35.8	41.1
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		752	650		261	
Approach Delay, s/veh		3.6	0.5		39.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	73.0	73.0	17.0
Change Period (Y+Rc), s	6.0	6.0	6.0
Max Green Setting (Gmax), s	54.0	54.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	6.3	10.2
Green Ext Time (p_c), s	21.2	14.8	0.8

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.0
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	631	2	1	619	1	2
Future Volume (vph)	631	2	1	619	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	664	2	1	652	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	666	0	0	653	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	631	2	1	619	1	2
Future Vol, veh/h	631	2	1	619	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	664	2	1	652	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	666	0	993	333
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	328	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1055	-	*839	*1051
Stage 1	-	-	-	-	*817	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1055	-	*838	*1051
Mov Cap-2 Maneuver	-	-	-	-	*838	-
Stage 1	-	-	-	-	*817	-
Stage 2	-	-	-	-	*993	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	969	-	-	1055	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.7	-	-	8.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	543	0	0	650	43	347	0	202	0	0	0
Future Volume (vph)	5	543	0	0	650	43	347	0	202	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.991				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5902	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5902	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					16				210			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	5	566	0	0	677	45	361	0	210	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	5	566	0	0	722	0	180	181	210	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		18.0	18.0	18.0			
Total Split (%)	14.4%				37.8%		20.0%	20.0%	20.0%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.8	66.8			32.5		13.2	13.2	13.2			
Actuated g/C Ratio	0.09	0.74			0.36		0.15	0.15	0.15			
v/c Ratio	0.03	0.23			0.33		0.75	0.76	0.52			
Control Delay (s/veh)	28.4	1.4			21.2		59.0	59.4	10.3			
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	28.4	1.5			21.2		59.0	59.4	10.3			
LOS	C	A			C		E	E	B			
Approach Delay (s/veh)		1.8			21.3			41.3				

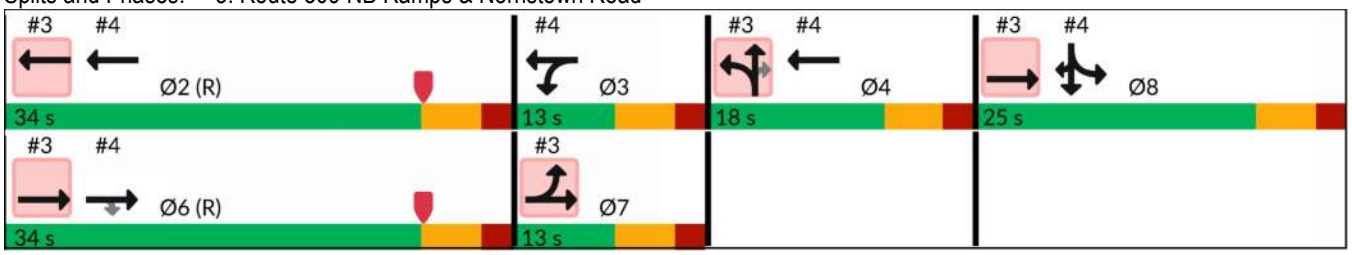
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	25.0
Total Split (%)	14%	38%	28%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			D				
Queue Length 50th (ft)	3	9			86		105	106	0			
Queue Length 95th (ft)	m10	30			111		#215	#216	61			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2407			2142		237	237	402			
Starvation Cap Reductn	0	884			0		0	0	0			
Spillback Cap Reductn	0	0			39		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.03	0.37			0.34		0.76	0.76	0.52			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 21.4 Intersection LOS: C
Intersection Capacity Utilization 71.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	481	363	122	929	0	0	0	0	45	0	11
Future Volume (vph)	0	481	363	122	929	0	0	0	0	45	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			390									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	517	390	131	999	0	0	0	0	48	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	517	390	131	999	0	0	0	0	0	48	12
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						25.0	25.0	25.0
Total Split (%)		37.8%	37.8%	14.4%						27.8%	27.8%	27.8%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.5	32.5	7.8	63.5						16.5	16.5
Actuated g/C Ratio		0.36	0.36	0.09	0.71						0.18	0.18
v/c Ratio		0.31	0.51	0.47	0.43						0.15	0.02
Control Delay (s/veh)		20.4	7.9	47.0	3.4						31.4	0.0
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		20.4	7.9	47.0	3.9						31.4	0.0
LOS		C	A	D	A						C	A
Approach Delay (s/veh)		15.1			8.9						25.1	

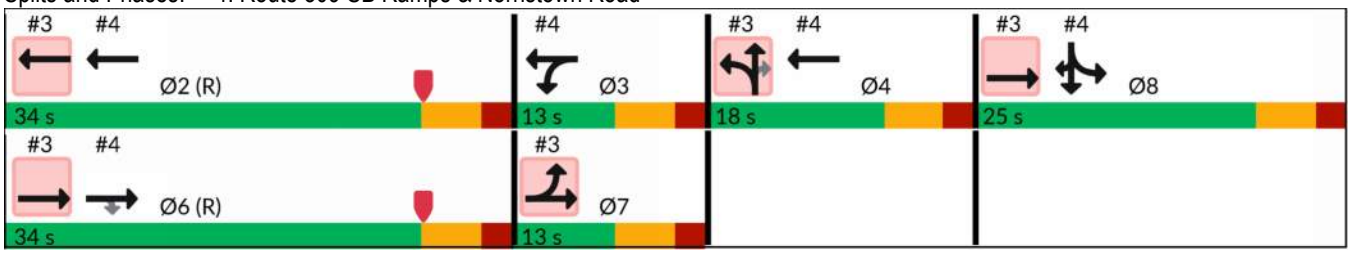
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	18.0	13.0
Total Split (%)	38%	20%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		74	0	41	20						24	0
Queue Length 95th (ft)		110	134	m65	46						51	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1658	757	280	2211						376	523
Starvation Cap Reductn		0	0	0	674						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.31	0.52	0.47	0.65						0.13	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 12.0 Intersection LOS: B
Intersection Capacity Utilization 71.6% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	445	51	55	416	5	67	84	60	8	84	117
Future Volume (vph)	142	445	51	55	416	5	67	84	60	8	84	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.998				0.850		0.924	
Flt Protected	0.950			0.950				0.978			0.998	
Satd. Flow (prot)	1701	3319	0	1710	1796	0	0	1688	1553	0	1573	0
Flt Permitted	0.385			0.459				0.583			0.987	
Satd. Flow (perm)	690	3319	0	826	1796	0	0	1006	1553	0	1556	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		68	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	149	468	54	58	438	5	71	88	63	8	88	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	522	0	58	443	0	0	159	63	0	219	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	37.0		13.0	37.0		13.0	40.0	40.0	27.0	27.0	
Total Split (%)	14.4%	41.1%		14.4%	41.1%		14.4%	44.4%	44.4%	30.0%	30.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	59.3	51.3		54.7	47.1			18.4	18.4		18.4	
Actuated g/C Ratio	0.66	0.57		0.61	0.52			0.20	0.20		0.20	
v/c Ratio	0.26	0.27		0.10	0.47			0.77	0.15		0.58	
Control Delay (s/veh)	3.2	4.8		6.8	17.6			57.1	2.1		27.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	3.2	4.8		6.8	17.6			57.1	2.1		27.4	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		4.5			16.4			41.5			27.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	6	34		9	149			86	0		77	
Queue Length 95th (ft)	23	60		28	296			141	9		134	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	563	1890		589	939			391	670		445	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.26	0.28		0.10	0.47			0.41	0.09		0.49	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay (s/veh): 16.4 Intersection LOS: B
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15

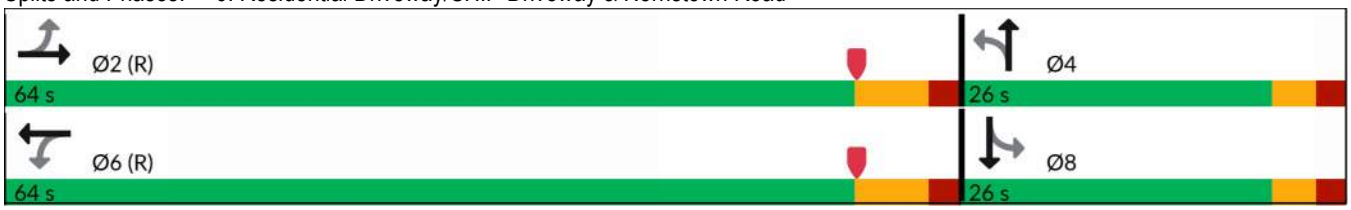
Splits and Phases: 5: Tennis Avenue & Norristown Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	843	15	20	847	0	8	0	14	7	0	0
Future Volume (vph)	0	843	15	20	847	0	8	0	14	7	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	0		0	0		0	50		50	0		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99							
Frt		0.997						0.850				
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3360	0	0	3434	0	1701	1522	0	1701	1791	0
Flt Permitted					0.923							
Satd. Flow (perm)	0	3360	0	0	3173	0	1791	1522	0	1791	1791	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4						183				
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	878	16	21	882	0	8	0	15	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	894	0	0	903	0	8	15	0	7	0	0
Turn Type		NA		Perm	NA		Perm	NA		Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	843	15	20	847	0	8	0	14	7	0	0
Future Volume (veh/h)	0	843	15	20	847	0	8	0	14	7	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	0	878	16	21	882	0	8	0	4	7	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	0	2940	54	78	2953	0	112	0	36	109	43	0
Arrive On Green	0.00	0.87	0.85	0.85	0.87	0.00	0.02	0.00	0.01	0.02	0.00	0.00
Sat Flow, veh/h	0	3488	62	41	3500	0	1360	0	1521	1355	1794	0
Grp Volume(v), veh/h	0	437	457	475	428	0	8	0	4	7	0	0
Grp Sat Flow(s),veh/h/ln	0	1691	1769	1815	1640	0	1360	0	1521	1355	1794	0
Q Serve(g_s), s	0.0	4.2	4.2	0.0	4.3	0.0	0.5	0.0	0.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.2	4.2	4.1	4.3	0.0	0.5	0.0	0.2	0.7	0.0	0.0
Prop In Lane	0.00		0.04	0.04		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1463	1531	1592	1419	0	112	0	36	109	43	0
V/C Ratio(X)	0.00	0.30	0.30	0.30	0.30	0.00	0.07	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	0	1463	1531	1592	1419	0	412	0	372	408	439	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.91	0.91	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.1	1.1	1.1	1.1	0.0	43.1	0.0	43.5	43.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	0.5	0.5	0.0	0.3	0.0	1.3	0.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.3	0.3	0.5	0.4	0.0	0.3	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	1.6	1.6	1.6	1.7	0.0	43.4	0.0	44.8	43.6	0.0	0.0
LnGrp LOS		A	A	A	A		D		D	D		
Approach Vol, veh/h		894			903			12			7	
Approach Delay, s/veh		1.6			1.6			43.9			43.6	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	6.1	83.9	6.1
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	0.0	2.5	0.0	2.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	2.0
HCM 6th LOS	A

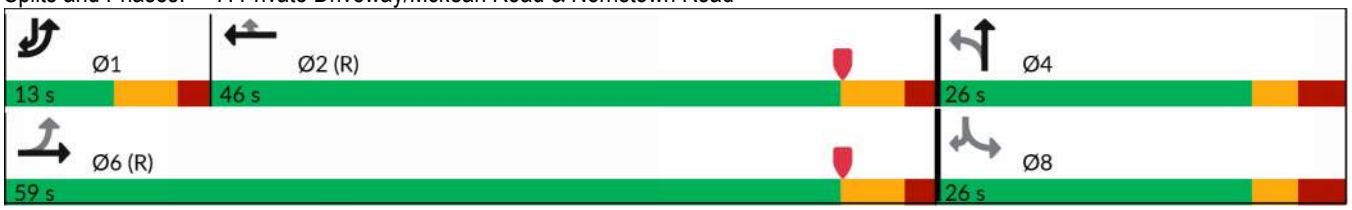
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	630	0	0	626	82	0	0	0	102	0	111
Future Volume (vph)	102	630	0	0	626	82	0	0	0	102	0	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	0		0	0		230	0		0	70		0
Storage Lanes	0		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	3350	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted		0.743								0.757		
Satd. Flow (perm)	0	2507	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						121
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	111	685	0	0	680	89	0	0	0	111	0	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	796	0	0	680	89	0	0	0	111	0	121
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	59.0			46.0	46.0	26.0	26.0		26.0		13.0
Total Split (%)	15.3%	69.4%			54.1%	54.1%	30.6%	30.6%		30.6%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)		-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)		65.0			55.7	55.7				13.6		22.6
Actuated g/C Ratio		0.76			0.66	0.66				0.16		0.27
v/c Ratio		0.40			0.30	0.08				0.53		0.24
Control Delay (s/veh)		5.2			9.4	1.4				41.5		5.2
Queue Delay		0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)		5.2			9.4	1.4				41.5		5.2
LOS		A			A	A				D		A
Approach Delay (s/veh)		5.2			8.6						22.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						C	
Queue Length 50th (ft)		67			90	0				55		0
Queue Length 95th (ft)		118			148	14				100		34
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)						230				70		
Base Capacity (vph)		1969			2209	1048				318		510
Starvation Cap Reductn		0			0	0				0		0
Spillback Cap Reductn		0			0	0				0		0
Storage Cap Reductn		0			0	0				0		0
Reduced v/c Ratio		0.40			0.31	0.08				0.35		0.24

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay (s/veh): 8.9 Intersection LOS: A
Intersection Capacity Utilization 57.4% ICU Level of Service B
Analysis Period (min) 15

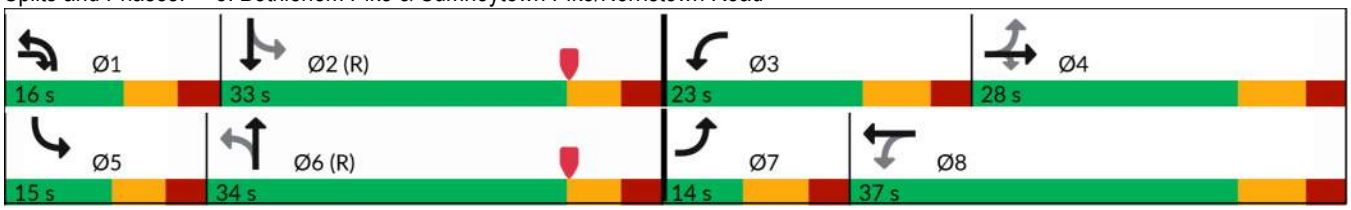
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	444	177	152	452	121	167	440	143	183	437	65
Future Volume (vph)	58	444	177	152	452	121	167	440	143	183	437	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.968			0.963			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3239	0	1558	3207	0	1604	3147	0
Flt Permitted	0.382			0.264			0.336			0.277		
Satd. Flow (perm)	636	3290	1624	469	3239	0	551	3207	0	468	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			218					44			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	62	477	190	163	486	130	180	473	154	197	470	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	477	190	163	616	0	180	627	0	197	540	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	14.0	28.0	16.0	23.0	37.0		16.0	34.0		15.0	33.0	
Total Split (%)	14.0%	28.0%	16.0%	23.0%	37.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	444	177	152	452	121	167	440	143	183	437	65
Future Volume (veh/h)	58	444	177	152	452	121	167	440	143	183	437	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	62	477	149	163	486	126	180	473	140	197	470	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	219	616	440	311	659	170	482	1010	297	417	1262	
Arrive On Green	0.05	0.18	0.18	0.10	0.23	0.22	0.10	0.37	0.36	0.09	0.36	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2893	746	1767	2747	808	1750	3583	0
Grp Volume(v), veh/h	62	477	149	163	308	304	180	309	304	197	470	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1801	1767	1803	1752	1750	1745	0
Q Serve(g_s), s	2.9	13.1	7.4	6.9	15.5	15.7	6.2	13.1	13.3	7.0	9.9	0.0
Cycle Q Clear(g_c), s	2.9	13.1	7.4	6.9	15.5	15.7	6.2	13.1	13.3	7.0	9.9	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.46	1.00		0.00
Lane Grp Cap(c), veh/h	219	616	440	311	419	410	482	663	644	417	1262	
V/C Ratio(X)	0.28	0.77	0.34	0.52	0.74	0.74	0.37	0.47	0.47	0.47	0.37	
Avail Cap(c_a), veh/h	245	727	492	413	551	540	489	663	644	417	1262	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.2	39.2	29.1	29.0	35.8	36.1	17.0	24.1	24.4	18.0	23.6	0.0
Incr Delay (d2), s/veh	0.7	4.4	0.5	1.3	3.4	3.7	0.5	2.4	2.5	0.8	0.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	9.8	5.0	5.4	11.3	11.3	4.3	9.7	9.6	4.9	7.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.9	43.6	29.5	30.3	39.2	39.8	17.5	26.5	26.9	18.8	24.4	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	B	C	
Approach Vol, veh/h		688			775			793			667	
Approach Delay, s/veh		39.5			37.6			24.6			22.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	42.1	17.5	24.8	15.0	42.8	12.5	29.8
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	15.0	20.0	8.0	27.0	6.0	29.0
Max Q Clear Time (g_c+I1), s	8.7	12.4	9.4	15.6	9.5	15.6	5.4	18.0
Green Ext Time (p_c), s	0.0	1.6	0.2	1.1	0.0	1.8	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	31.1
HCM 6th LOS	C

Notes

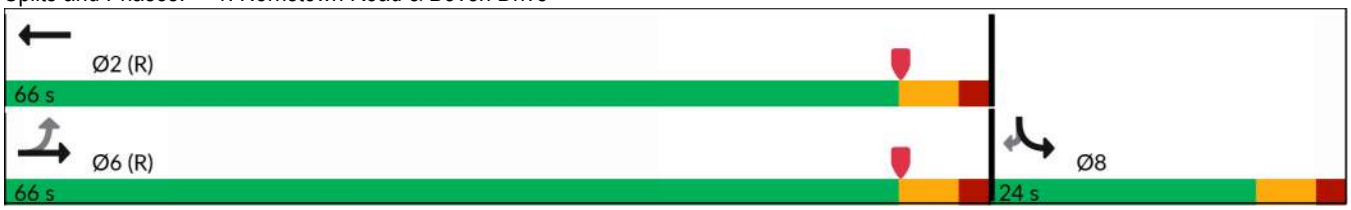
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2032 Projected Conditions Without SHIP Development with Improvements

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	707	638	59	50	111
Future Volume (vph)	147	707	638	59	50	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.987			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3154	0	1906	1137
Flt Permitted	0.376				0.950	
Satd. Flow (perm)	661	3211	3154	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			24			116
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	153	736	665	61	52	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	736	726	0	52	116
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	66.0	66.0	66.0		24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%		26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	707	638	59	50	111
Future Volume (veh/h)	147	707	638	59	50	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	153	736	665	61	52	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	638	2642	2378	218	262	156
Arrive On Green	0.76	0.76	1.00	1.00	0.12	0.12
Sat Flow, veh/h	730	3544	3197	285	2115	1255
Grp Volume(v), veh/h	153	736	359	367	52	115
Grp Sat Flow(s),veh/h/ln	730	1727	1678	1715	2115	1255
Q Serve(g_s), s	5.6	5.7	0.0	0.0	2.0	8.0
Cycle Q Clear(g_c), s	5.6	5.7	0.0	0.0	2.0	8.0
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	638	2642	1284	1312	262	156
V/C Ratio(X)	0.24	0.28	0.28	0.28	0.20	0.74
Avail Cap(c_a), veh/h	638	2642	1284	1312	447	265
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.1	3.2	0.0	0.0	35.4	38.0
Incr Delay (d2), s/veh	0.9	0.3	0.5	0.5	0.4	6.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	2.1	0.3	0.3	1.9	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.0	3.4	0.5	0.5	35.8	44.7
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		889	726		167	
Approach Delay, s/veh		3.5	0.5		41.9	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.8				73.8	16.2
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	60.0				60.0	18.0
Max Q Clear Time (g_c+I1), s	2.0				7.7	10.0
Green Ext Time (p_c), s	25.6				22.6	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.9
HCM 6th LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	1028	566	62	94	168
Future Volume (vph)	151	1028	566	62	94	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.985			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3183	0	1906	1705
Flt Permitted	0.343				0.950	
Satd. Flow (perm)	603	3274	3183	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			202
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	191	1301	716	78	119	213
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	1301	794	0	119	213
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	55.0	55.0	55.0		35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%		38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	1028	566	62	94	168
Future Volume (veh/h)	151	1028	566	62	94	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	191	1301	716	78	119	203
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	587	2594	2258	246	316	281
Arrive On Green	0.74	0.74	1.00	1.00	0.15	0.15
Sat Flow, veh/h	685	3600	3141	332	2115	1882
Grp Volume(v), veh/h	191	1301	393	401	119	203
Grp Sat Flow(s),veh/h/ln	685	1754	1678	1707	2115	1882
Q Serve(g_s), s	9.1	13.8	0.0	0.0	4.6	9.3
Cycle Q Clear(g_c), s	9.1	13.8	0.0	0.0	4.6	9.3
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	587	2594	1241	1262	316	281
V/C Ratio(X)	0.33	0.50	0.32	0.32	0.38	0.72
Avail Cap(c_a), veh/h	587	2594	1241	1262	705	627
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	4.8	0.0	0.0	34.5	36.5
Incr Delay (d2), s/veh	1.5	0.7	0.7	0.7	0.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	5.9	0.4	0.4	4.3	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.7	5.5	0.7	0.7	35.3	40.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1492	794		322	
Approach Delay, s/veh		5.6	0.7		38.3	
Approach LOS		A	A		D	

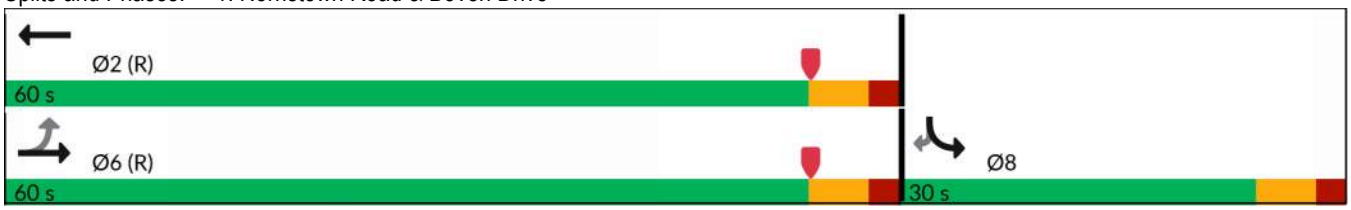
Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	71.6				71.6	18.4
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	49.0				49.0	29.0
Max Q Clear Time (g_c+I1), s	2.0				15.8	11.3
Green Ext Time (p_c), s	25.6				29.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.1
HCM 6th LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	544	541	77	79	170
Future Volume (vph)	170	544	541	77	79	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.981			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3227	0	1906	1705
Flt Permitted	0.405				0.950	
Satd. Flow (perm)	712	3306	3227	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			32			179
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	179	573	569	81	83	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	573	650	0	83	179
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	60.0	60.0	60.0		30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%		33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	544	541	77	79	170
Future Volume (veh/h)	170	544	541	77	79	170
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	179	573	569	81	83	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	672	2672	2265	322	281	250
Arrive On Green	0.76	0.76	1.00	1.00	0.13	0.13
Sat Flow, veh/h	783	3628	3087	426	2115	1882
Grp Volume(v), veh/h	179	573	323	327	83	178
Grp Sat Flow(s),veh/h/ln	783	1767	1705	1718	2115	1882
Q Serve(g_s), s	6.5	4.3	0.0	0.0	3.2	8.2
Cycle Q Clear(g_c), s	6.5	4.3	0.0	0.0	3.2	8.2
Prop In Lane	1.00			0.25	1.00	1.00
Lane Grp Cap(c), veh/h	672	2672	1289	1298	281	250
V/C Ratio(X)	0.27	0.21	0.25	0.25	0.29	0.71
Avail Cap(c_a), veh/h	672	2672	1289	1298	588	523
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.2	0.0	0.0	35.2	37.4
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.5	0.6	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	1.7	0.3	0.3	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.4	3.4	0.5	0.5	35.8	41.1
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		752	650		261	
Approach Delay, s/veh		3.6	0.5		39.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.0				73.0	17.0
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	54.0				54.0	24.0
Max Q Clear Time (g_c+I1), s	2.0				6.3	10.2
Green Ext Time (p_c), s	21.2				14.8	0.8

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.0
HCM 6th LOS	A

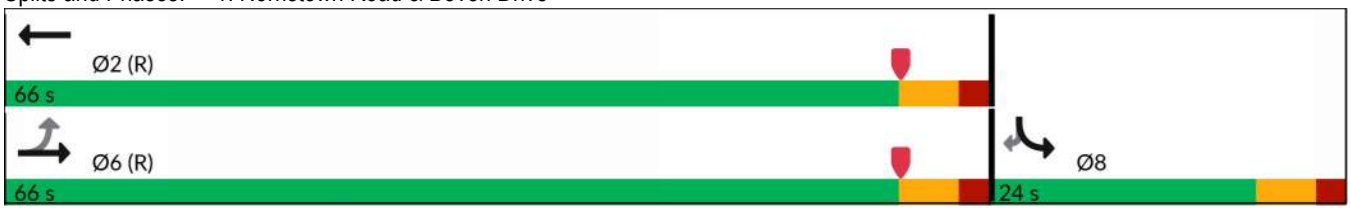
2032 Base Conditions With SHIP Development

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	759	815	8	1	2
Future Volume (vph)	8	759	815	8	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3219	0	1906	1137
Flt Permitted	0.330				0.950	
Satd. Flow (perm)	580	3211	3219	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			2			2
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	8	791	849	8	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	791	857	0	1	2
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	66.0	66.0	66.0		24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%		26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	759	815	8	1	2
Future Volume (veh/h)	8	759	815	8	1	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	8	791	849	8	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	646	3026	2985	28	27	16
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.01
Sat Flow, veh/h	646	3544	3495	32	2115	1255
Grp Volume(v), veh/h	8	791	418	439	1	1
Grp Sat Flow(s),veh/h/ln	646	1727	1678	1761	2115	1255
Q Serve(g_s), s	0.1	3.3	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.1	3.3	0.0	0.0	0.0	0.1
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	646	3026	1470	1543	27	16
V/C Ratio(X)	0.01	0.26	0.28	0.28	0.04	0.06
Avail Cap(c_a), veh/h	646	3026	1470	1543	447	265
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.7	0.9	0.0	0.0	43.9	43.9
Incr Delay (d2), s/veh	0.0	0.2	0.5	0.5	0.6	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.2	0.4	0.4	0.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.1	0.5	0.5	44.4	45.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		799	857		2	
Approach Delay, s/veh		1.1	0.5		45.0	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	83.9				83.9	6.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	60.0				60.0	18.0
Max Q Clear Time (g_c+I1), s	2.0				5.3	2.1
Green Ext Time (p_c), s	31.4				28.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	766	1	0	827	3	2
Future Volume (vph)	766	1	0	827	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	806	1	0	871	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	807	0	0	871	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	766	1	0	827	3	2
Future Vol, veh/h	766	1	0	827	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	806	1	0	871	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	807	0	1243	404
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	436	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	979	-	*664	*999
Stage 1	-	-	-	-	*746	-
Stage 2	-	-	-	-	*913	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	979	-	*664	*999
Mov Cap-2 Maneuver	-	-	-	-	*664	-
Stage 1	-	-	-	-	*746	-
Stage 2	-	-	-	-	*913	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	767	-	-	979	-
HCM Lane V/C Ratio	0.007	-	-	-	-
HCM Control Delay (s/veh)	9.7	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	521	0	0	792	25	834	0	252	0	0	0
Future Volume (vph)	6	521	0	0	792	25	834	0	252	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.995				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5806	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5806	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					6				235			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	6	532	0	0	808	26	851	0	257	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	6	532	0	0	834	0	425	426	257	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				22.0		34.0	34.0	34.0			
Total Split (%)	14.4%				24.4%		37.8%	37.8%	37.8%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	8.0	51.0			17.0		29.0	29.0	29.0			
Actuated g/C Ratio	0.09	0.57			0.19		0.32	0.32	0.32			
v/c Ratio	0.05	0.30			0.75		0.82	0.82	0.39			
Control Delay (s/veh)	15.3	2.3			30.0		43.5	43.7	6.2			
Queue Delay	0.0	0.3			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	15.3	2.6			30.0		43.5	43.7	6.2			

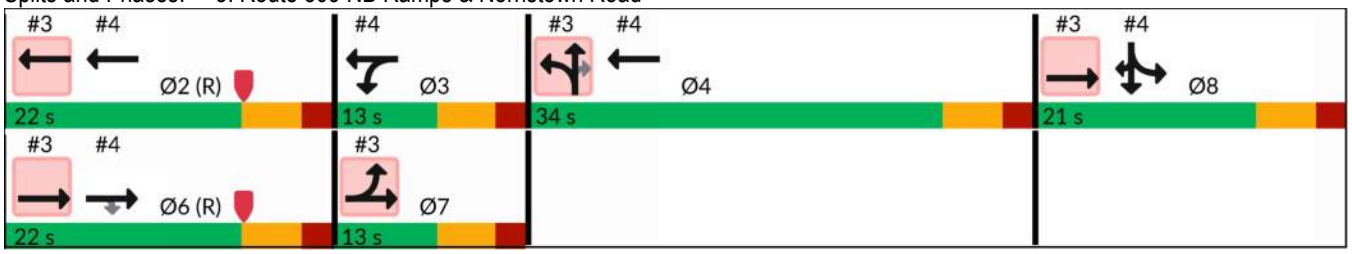
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	13.0	22.0	21.0
Total Split (%)	14%	24%	23%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		D	D	A			
Approach Delay (s/veh)		2.8			30.0			35.0				
Approach LOS		A			C			C				
Queue Length 50th (ft)	4	26			117		232	233	9			
Queue Length 95th (ft)	m7	44			143		#398	#401	62			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	116	1758			1101		515	515	649			
Starvation Cap Reductn	0	665			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.05	0.49			0.76		0.83	0.83	0.40			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 26.3 Intersection LOS: C
Intersection Capacity Utilization 96.0% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	495	551	170	1453	0	0	0	0	46	0	29
Future Volume (vph)	0	495	551	170	1453	0	0	0	0	46	0	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1693
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			557									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	500	557	172	1468	0	0	0	0	46	0	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	500	557	172	1468	0	0	0	0	0	46	29
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		22.0	22.0	13.0						21.0	21.0	21.0
Total Split (%)		24.4%	24.4%	14.4%						23.3%	23.3%	23.3%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		17.0	17.0	8.0	64.0						16.0	16.0
Actuated g/C Ratio		0.19	0.19	0.09	0.71						0.18	0.18
v/c Ratio		0.58	0.78	0.61	0.64						0.16	0.06
Control Delay (s/veh)		33.9	18.7	45.3	3.5						33.1	0.2
Queue Delay		0.0	0.0	0.0	8.3						0.0	0.0
Total Delay (s/veh)		33.9	18.7	45.3	11.9						33.1	0.2

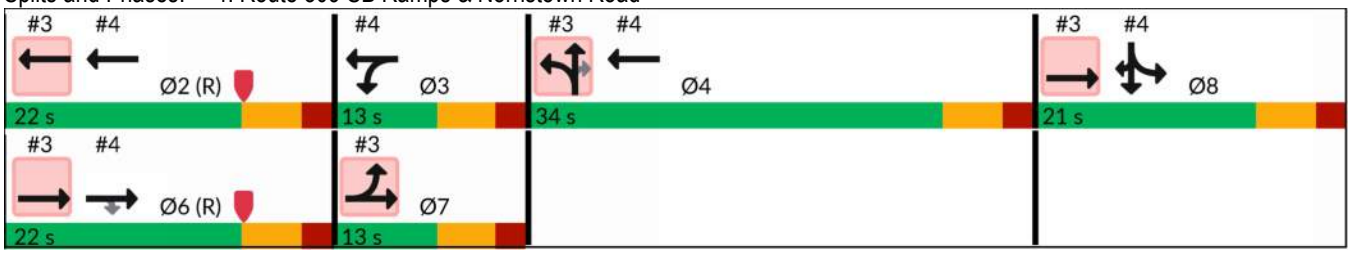
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	22.0	34.0	13.0
Total Split (%)	24%	38%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	B	D	B						C	A
Approach Delay (s/veh)		25.9			15.4						20.5	
Approach LOS		C			B						C	
Queue Length 50th (ft)		97	83	55	82						22	0
Queue Length 95th (ft)		133	#268	m70	77						53	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		850	709	280	2271						279	454
Starvation Cap Reductn		0	0	0	772						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.59	0.79	0.61	0.98						0.16	0.06

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 19.6 Intersection LOS: B
Intersection Capacity Utilization 96.0% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

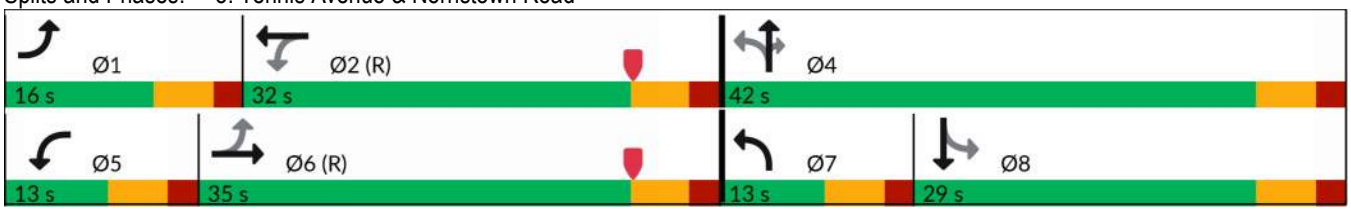
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	482	47	104	406	4	81	95	89	3	168	274
Future Volume (vph)	235	482	47	104	406	4	81	95	89	3	168	274
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.987			0.999				0.850		0.917	
Flt Protected	0.950			0.950				0.977				
Satd. Flow (prot)	1652	3219	0	1613	1759	0	0	1645	1465	0	1519	0
Flt Permitted	0.185			0.403				0.582			0.999	
Satd. Flow (perm)	322	3219	0	684	1759	0	0	980	1465	0	1517	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		87	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	255	524	51	113	441	4	88	103	97	3	183	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	575	0	113	445	0	0	191	97	0	484	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	16.0	35.0		13.0	32.0		13.0	42.0	42.0	29.0	29.0	
Total Split (%)	17.8%	38.9%		14.4%	35.6%		14.4%	46.7%	46.7%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	42.6	33.3		35.5	27.4			36.1	36.1		36.1	
Actuated g/C Ratio	0.47	0.37		0.39	0.30			0.40	0.40		0.40	
v/c Ratio	0.78	0.48		0.32	0.83			0.48	0.14		0.73	
Control Delay (s/veh)	47.7	11.0		16.0	44.6			25.0	3.4		26.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	47.7	11.0		16.0	44.6			25.0	3.4		26.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	B		B	D			C	A		C	
Approach Delay (s/veh)		22.3			38.9			17.8			26.1	
Approach LOS		C			D			B			C	
Queue Length 50th (ft)	93	56		34	235			78	0		187	
Queue Length 95th (ft)	#210	83		66	#400			143	24		308	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	323	1190		356	535			402	666		659	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.79	0.48		0.32	0.83			0.48	0.15		0.73	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 26.9 Intersection LOS: C
Intersection Capacity Utilization 90.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

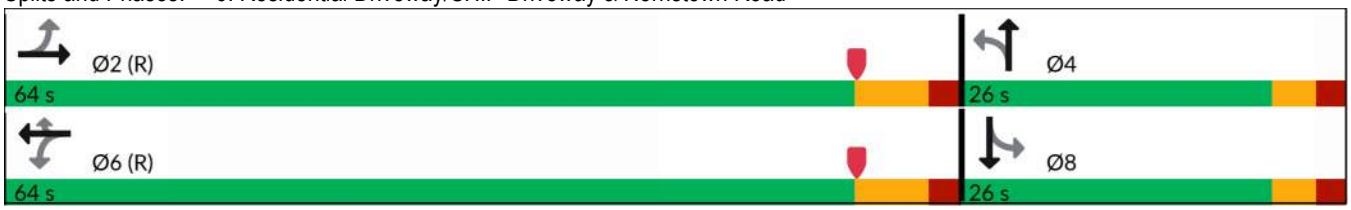
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1037	21	17	1195	171	7	0	10	57	0	42
Future Volume (vph)	191	1037	21	17	1195	171	7	0	10	57	0	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	250		0	0		225	50		50	0		0
Storage Lanes	1		0	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850		0.850			0.850	
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	1701	3262	0	0	3365	1553	1701	1269	0	1492	1522	0
Flt Permitted	0.206				0.930		0.729			0.751		
Satd. Flow (perm)	369	3262	0	0	3133	1553	1306	1269	0	1180	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				176		122			86	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	197	1069	22	18	1232	176	7	0	10	59	0	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	1091	0	0	1250	176	7	10	0	59	43	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0	21.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0	28.0	8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0	64.0	26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%	71.1%	28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	1037	21	17	1195	171	7	0	10	57	0	42
Future Volume (veh/h)	191	1037	21	17	1195	171	7	0	10	57	0	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	197	1069	21	18	1232	176	7	0	3	59	0	39
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	337	2679	53	57	2760	1310	153	0	122	175	0	122
Arrive On Green	0.81	0.81	0.80	0.80	0.81	0.81	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	367	3313	65	20	3413	1620	1313	0	1521	1208	0	1521
Grp Volume(v), veh/h	197	533	557	664	586	176	7	0	3	59	0	39
Grp Sat Flow(s),veh/h/ln	367	1651	1727	1817	1616	1620	1313	0	1521	1208	0	1521
Q Serve(g_s), s	31.4	8.2	8.2	0.0	9.8	2.1	0.5	0.0	0.2	4.3	0.0	2.2
Cycle Q Clear(g_c), s	41.2	8.2	8.2	9.6	9.8	2.1	2.7	0.0	0.2	4.4	0.0	2.2
Prop In Lane	1.00		0.04	0.03		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	1335	1396	1490	1306	1310	153	0	122	175	0	122
V/C Ratio(X)	0.59	0.40	0.40	0.45	0.45	0.13	0.05	0.00	0.02	0.34	0.00	0.32
Avail Cap(c_a), veh/h	337	1335	1396	1490	1306	1310	369	0	372	373	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.8	2.4	2.4	2.6	2.6	1.9	40.3	0.0	38.6	40.2	0.0	39.5
Incr Delay (d2), s/veh	6.2	0.8	0.7	1.0	1.1	0.2	0.1	0.0	0.1	1.1	0.0	1.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	2.2	2.3	3.5	2.8	0.6	0.3	0.0	0.1	2.3	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.0	3.2	3.2	3.5	3.7	2.1	40.4	0.0	38.7	41.3	0.0	41.0
LnGrp LOS	B	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		1287			1426			10			98	
Approach Delay, s/veh		5.0			3.4			39.9			41.2	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		78.8		11.2		78.8		11.2				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		57.0		21.0		57.0		21.0				
Max Q Clear Time (g_c+I1), s		43.2		4.7		4.1		6.4				
Green Ext Time (p_c), s		0.3		0.0		0.3		0.3				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			5.6									
HCM 6th LOS			A									

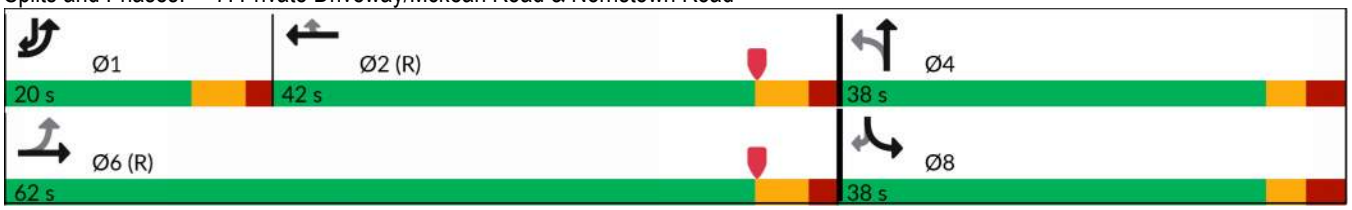
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1057	0	0	862	236	0	0	0	160	0	120
Future Volume (vph)	200	1057	0	0	862	236	0	0	0	160	0	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	350		0	0		230	0		0	70		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1685	3336	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted	0.206									0.950		
Satd. Flow (perm)	365	3336	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						265						33
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	225	1188	0	0	969	265	0	0	0	180	0	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	1188	0	0	969	265	0	0	0	180	0	135
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	62.0			42.0	42.0	38.0	38.0		38.0		20.0
Total Split (%)	20.0%	62.0%			42.0%	42.0%	38.0%	38.0%		38.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)	72.4	72.4			54.5	54.5				17.6		35.5
Actuated g/C Ratio	0.72	0.72			0.55	0.55				0.18		0.36
v/c Ratio	0.51	0.49			0.52	0.27				0.63		0.24
Control Delay (s/veh)	9.5	7.3			17.6	3.0				47.9		15.9
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)	9.5	7.3			17.6	3.0				47.9		15.9
LOS	A	A			B	A				D		B
Approach Delay (s/veh)		7.7			14.5						34.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B						C	
Queue Length 50th (ft)	39	145			193	0				108		45
Queue Length 95th (ft)	81	235			330	45				164		69
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)	350					230				70		
Base Capacity (vph)	474	2415			1837	950				529		586
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.47	0.49			0.53	0.28				0.34		0.23

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 13.4 Intersection LOS: B
Intersection Capacity Utilization 57.9% ICU Level of Service B
Analysis Period (min) 15
! Phase conflict between lane groups.

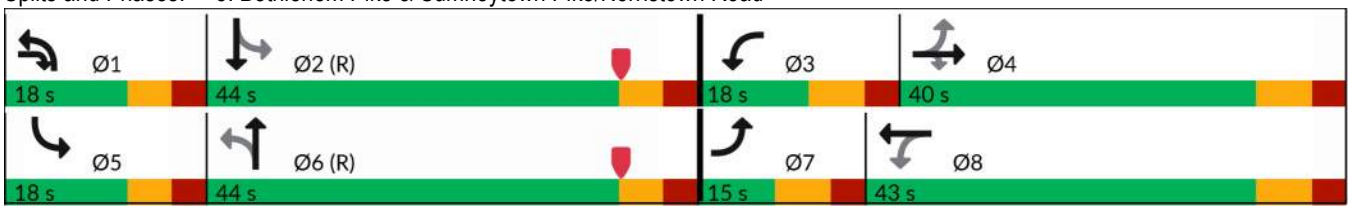
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	925	289	165	729	60	206	268	249	154	400	58
Future Volume (vph)	50	925	289	165	729	60	206	268	249	154	400	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.989			0.928			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3240	0	1528	3008	0	1588	3033	0
Flt Permitted	0.185			0.103			0.363			0.326		
Satd. Flow (perm)	305	3257	1562	181	3240	0	584	3008	0	545	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			181					206			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	54	995	311	177	784	65	222	288	268	166	430	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	995	311	177	849	0	222	556	0	166	492	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	40.0	18.0	18.0	43.0		18.0	44.0		18.0	44.0	
Total Split (%)	12.5%	33.3%	15.0%	15.0%	35.8%		15.0%	36.7%		15.0%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	925	289	165	729	60	206	268	249	154	400	58
Future Volume (veh/h)	50	925	289	165	729	60	206	268	249	154	400	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	54	995	229	177	784	65	222	288	216	166	430	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	206	945	584	229	1090	90	437	632	460	400	1071	
Arrive On Green	0.04	0.28	0.28	0.09	0.32	0.31	0.10	0.32	0.32	0.09	0.32	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3386	281	1739	1945	1417	1736	3472	0
Grp Volume(v), veh/h	54	995	229	177	419	430	222	260	244	166	430	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1856	1739	1762	1600	1736	1691	0
Q Serve(g_s), s	2.7	33.0	12.9	8.0	24.5	24.5	10.2	14.0	14.7	7.5	11.9	0.0
Cycle Q Clear(g_c), s	2.7	33.0	12.9	8.0	24.5	24.5	10.2	14.0	14.7	7.5	11.9	0.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.89	1.00		0.00
Lane Grp Cap(c), veh/h	206	945	584	229	583	597	437	573	520	400	1071	
V/C Ratio(X)	0.26	1.05	0.39	0.77	0.72	0.72	0.51	0.45	0.47	0.42	0.40	
Avail Cap(c_a), veh/h	243	945	584	229	583	597	437	573	520	414	1071	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	43.5	27.5	30.7	35.9	36.0	24.2	32.1	32.7	24.1	32.1	0.0
Incr Delay (d2), s/veh	0.7	44.2	0.4	13.2	3.7	3.6	1.0	2.6	3.0	0.7	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	27.6	8.3	7.3	16.0	16.4	7.6	10.4	10.0	5.5	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.0	87.7	27.9	43.9	39.6	39.6	25.1	34.7	35.7	24.8	33.2	0.0
LnGrp LOS	C	F	C	D	D	D	C	C	D	C	C	
Approach Vol, veh/h		1278			1026			726			596	
Approach Delay, s/veh		74.6			40.3			32.1			30.9	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	44.0	18.0	40.0	17.0	45.0	12.4	45.6
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	10.0	32.0	11.0	37.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	12.7	14.4	10.5	35.5	10.0	16.7	5.2	27.0
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	1.8	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	49.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	1231	623	0	2	8
Future Volume (vph)	7	1231	623	0	2	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3225	0	1906	1705
Flt Permitted	0.353				0.950	
Satd. Flow (perm)	620	3274	3225	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						10
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	9	1558	789	0	3	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1558	789	0	3	10
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	56.0	56.0	56.0		34.0	34.0
Total Split (%)	62.2%	62.2%	62.2%		37.8%	37.8%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	1231	623	0	2	8
Future Volume (veh/h)	7	1231	623	0	2	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	9	1558	789	0	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	682	3070	2938	0	29	25
Arrive On Green	0.88	0.88	1.00	0.00	0.01	0.00
Sat Flow, veh/h	688	3600	3533	0	2115	1882
Grp Volume(v), veh/h	9	1558	789	0	3	0
Grp Sat Flow(s),veh/h/ln	688	1754	1678	0	2115	1882
Q Serve(g_s), s	0.1	9.0	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.1	9.0	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	682	3070	2938	0	29	25
V/C Ratio(X)	0.01	0.51	0.27	0.00	0.10	0.00
Avail Cap(c_a), veh/h	682	3070	2938	0	682	606
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	1.3	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.2	0.0	1.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.5	0.2	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.9	0.2	0.0	45.4	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		1567	789		3	
Approach Delay, s/veh		1.9	0.2		45.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	83.8			83.8	6.2
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	50.0			50.0	28.0
Max Q Clear Time (g_c+I1), s	2.0			11.0	2.1
Green Ext Time (p_c), s	26.3			36.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	1.4
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1268	2	1	621	3	1
Future Volume (vph)	1268	2	1	621	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1510	2	1	739	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1512	0	0	740	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1268	2	1	621	3	1
Future Vol, veh/h	1268	2	1	621	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1510	2	1	739	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1512	0	1883	756
Stage 1	-	-	-	-	1511	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	547	-	*121	*844
Stage 1	-	-	-	-	*333	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	547	-	*121	*844
Mov Cap-2 Maneuver	-	-	-	-	*121	-
Stage 1	-	-	-	-	*333	-
Stage 2	-	-	-	-	*991	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	29.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	154	-	-	547	-
HCM Lane V/C Ratio	0.031	-	-	0.002	-
HCM Control Delay (s/veh)	29.1	-	-	11.6	0
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1040	0	0	565	59	393	0	184	0	0	0
Future Volume (vph)	24	1040	0	0	565	59	393	0	184	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.986				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5741	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5741	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					28				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	29	1268	0	0	689	72	479	0	224	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	29	1268	0	0	761	0	239	240	224	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	15.0				32.0		23.0	23.0	23.0			
Total Split (%)	16.7%				35.6%		25.6%	25.6%	25.6%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	10.0	62.0			27.0		18.0	18.0	18.0			
Actuated g/C Ratio	0.11	0.69			0.30		0.20	0.20	0.20			
v/c Ratio	0.15	0.57			0.43		0.75	0.75	0.50			
Control Delay (s/veh)	30.7	5.9			18.4		50.6	50.8	12.5			
Queue Delay	0.0	0.9			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	30.7	6.8			18.4		50.6	50.8	12.5			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		7.4			18.5			38.6				

Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	15.0	32.0	20.0
Total Split (%)	17%	36%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

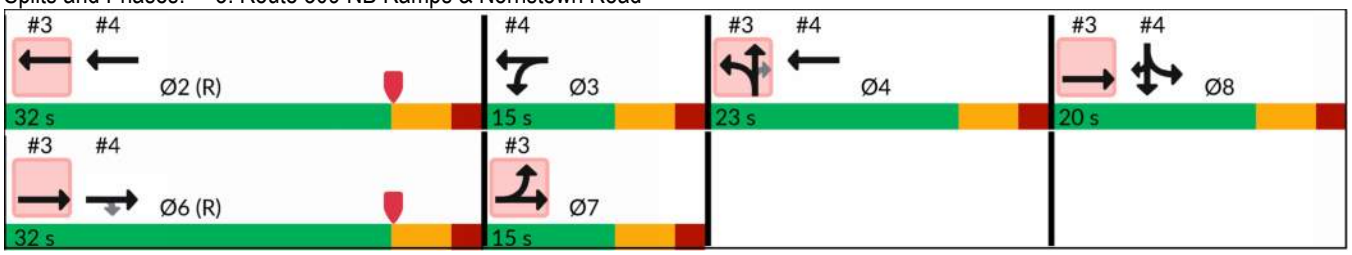
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	17	93			91		135	136	20			
Queue Length 95th (ft)	m36	58			54		#213	#214	66			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	182	2221			1741		317	317	441			
Starvation Cap Reductn	0	617			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.16	0.79			0.44		0.75	0.76	0.51			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay (s/veh): 18.4 Intersection LOS: B
Intersection Capacity Utilization 108.5% ICU Level of Service G
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	672	946	159	904	0	0	0	0	25	2	9
Future Volume (vph)	0	672	946	159	904	0	0	0	0	25	2	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.956	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Flt Permitted				0.950							0.956	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1692	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			874									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	707	996	167	952	0	0	0	0	26	2	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	707	996	167	952	0	0	0	0	0	28	9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		32.0	32.0	15.0						20.0	20.0	20.0
Total Split (%)		35.6%	35.6%	16.7%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		27.0	27.0	10.0	65.0						15.0	15.0
Actuated g/C Ratio		0.30	0.30	0.11	0.72						0.17	0.17
v/c Ratio		0.50	0.96	0.47	0.40						0.09	0.02
Control Delay (s/veh)		21.4	29.3	45.5	2.3						32.9	0.1
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		21.4	29.3	45.5	2.7						32.9	0.1
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		26.1			9.2						24.9	

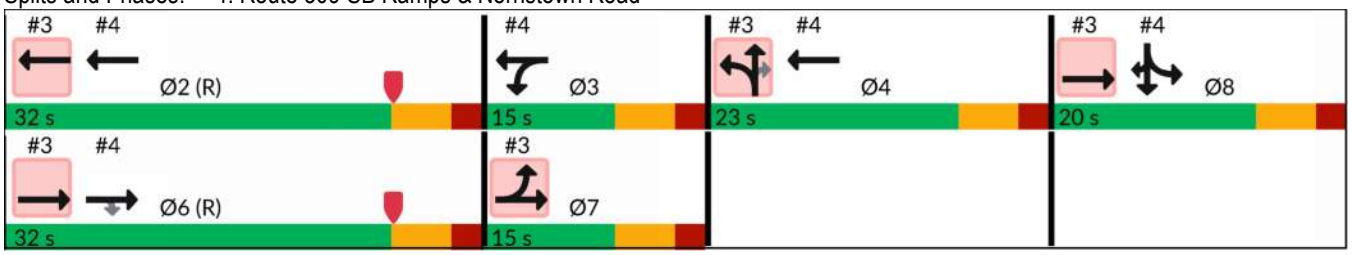
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	32.0	23.0	15.0
Total Split (%)	36%	26%	17%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A						C	
Queue Length 50th (ft)		131	356	53	17						14	0
Queue Length 95th (ft)		m145	m#444	m80	33						38	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1404	1033	351	2352						282	437
Starvation Cap Reductn		0	0	0	846						0	0
Spillback Cap Reductn		5	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.51	0.96	0.48	0.63						0.10	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay (s/veh): 19.4 Intersection LOS: B
Intersection Capacity Utilization 108.5% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

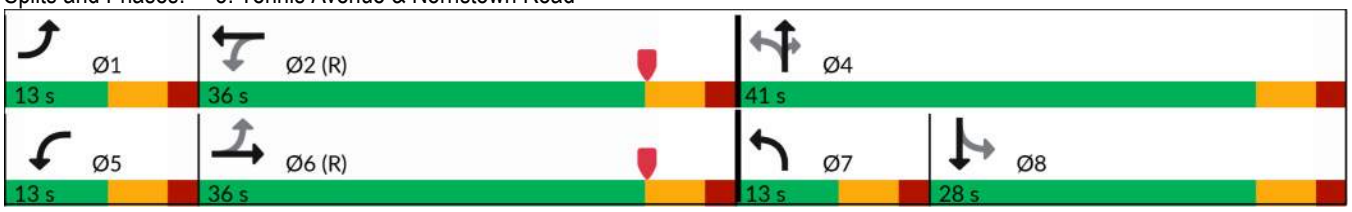
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	560	422	75	389	13	67	154	86	8	124	158
Future Volume (vph)	286	560	422	75	389	13	67	154	86	8	124	158
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.936			0.995				0.850		0.926	
Flt Protected	0.950			0.950				0.985			0.999	
Satd. Flow (prot)	1652	3123	0	1693	1736	0	0	1671	1493	0	1564	0
Flt Permitted	0.238			0.187				0.691			0.989	
Satd. Flow (perm)	414	3123	0	333	1736	0	0	1172	1493	0	1549	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		65	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	321	629	474	84	437	15	75	173	97	9	139	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	1103	0	84	452	0	0	248	97	0	326	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	51.8	42.5		40.0	32.0			26.8	26.8		26.8	
Actuated g/C Ratio	0.58	0.47		0.44	0.36			0.30	0.30		0.30	
v/c Ratio	0.69	0.74		0.31	0.73			0.71	0.18		0.64	
Control Delay (s/veh)	26.9	16.4		14.0	33.9			38.6	4.0		26.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	26.9	16.4		14.0	33.9			38.6	4.0		26.6	
LOS	C	B		B	C			D	A		C	
Approach Delay (s/veh)		18.8			30.8			28.9			26.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	71	134		19	224			124	0		127	
Queue Length 95th (ft)	#288	#462		49	336			178	24		181	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	460	1475		275	619			468	662		529	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.70	0.75		0.31	0.73			0.53	0.15		0.62	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 23.6 Intersection LOS: C
Intersection Capacity Utilization 85.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

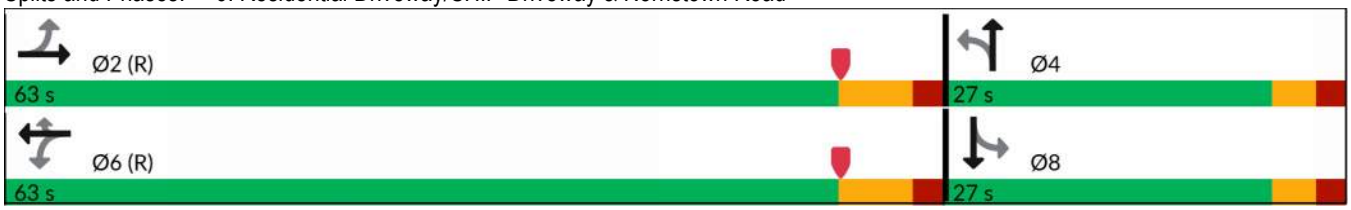
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1288	15	15	924	37	13	0	39	259	0	203
Future Volume (vph)	39	1288	15	15	924	37	13	0	39	259	0	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	250		0	0		225	50		50	0		0
Storage Lanes	1		0	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850			0.850	
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	1454	3363	0	0	3434	1553	1701	1522	0	1668	1492	0
Flt Permitted	0.235				0.912		0.459			0.729		
Satd. Flow (perm)	360	3363	0	0	3135	1553	822	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				41		53			128	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	43	1431	17	17	1027	41	14	0	43	288	0	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	1448	0	0	1044	41	14	43	0	288	226	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0	21.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0	28.0	8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0	63.0	27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1288	15	15	924	37	13	0	39	259	0	203
Future Volume (veh/h)	39	1288	15	15	924	37	13	0	39	259	0	203
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	43	1431	15	17	1027	41	14	0	21	288	0	197
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	288	2172	23	55	2171	1026	244	0	389	402	0	389
Arrive On Green	0.84	0.84	0.83	0.62	0.63	0.63	0.26	0.00	0.24	0.26	0.00	0.24
Sat Flow, veh/h	439	3429	36	22	3428	1620	1138	0	1521	1314	0	1521
Grp Volume(v), veh/h	43	705	741	548	496	41	14	0	21	288	0	197
Grp Sat Flow(s),veh/h/ln	439	1691	1774	1809	1640	1620	1138	0	1521	1314	0	1521
Q Serve(g_s), s	3.7	13.3	13.3	0.0	14.3	0.9	1.0	0.0	1.0	19.1	0.0	10.1
Cycle Q Clear(g_c), s	18.0	13.3	13.3	13.5	14.3	0.9	11.0	0.0	1.0	20.0	0.0	10.1
Prop In Lane	1.00		0.02	0.03		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	288	1071	1123	1167	1039	1026	244	0	389	402	0	389
V/C Ratio(X)	0.15	0.66	0.66	0.47	0.48	0.04	0.06	0.00	0.05	0.72	0.00	0.51
Avail Cap(c_a), veh/h	288	1071	1123	1167	1039	1026	244	0	389	402	0	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.1	3.6	3.7	8.5	8.7	6.2	33.4	0.0	25.7	32.9	0.0	29.1
Incr Delay (d2), s/veh	0.9	2.5	2.4	1.4	1.6	0.1	0.1	0.0	0.1	6.0	0.0	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	5.1	5.3	8.6	7.9	0.5	0.5	0.0	0.6	10.8	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	7.9	6.2	6.1	9.9	10.2	6.3	33.5	0.0	25.7	38.9	0.0	30.2
LnGrp LOS	A	A	A	A	B	A	C		C	D		C
Approach Vol, veh/h		1489			1085			35			485	
Approach Delay, s/veh		6.2			9.9			28.8			35.3	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		63.0		27.0		63.0		27.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		56.0		22.0		56.0		22.0				
Max Q Clear Time (g_c+I1), s		20.0		13.0		2.9		22.0				
Green Ext Time (p_c), s		0.3		0.0		0.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			12.3									
HCM 6th LOS			B									

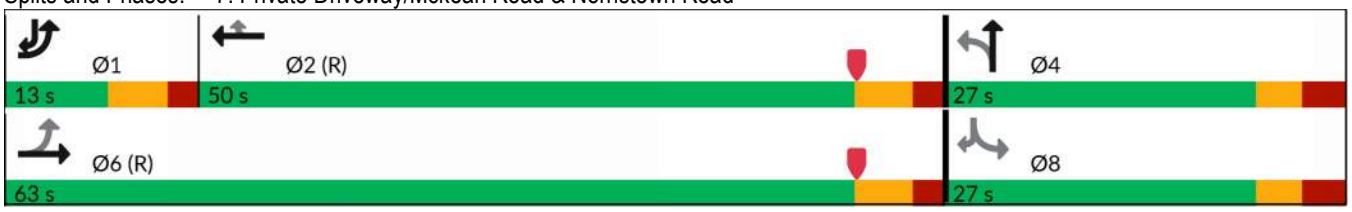
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	1029	0	0	1014	123	0	0	0	259	0	208
Future Volume (vph)	111	1029	0	0	1014	123	0	0	0	259	0	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	350		0	0		230	0		0	70		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1701	3369	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted	0.159									0.757		
Satd. Flow (perm)	285	3369	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						131						61
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	118	1095	0	0	1079	131	0	0	0	276	0	221
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	1095	0	0	1079	131	0	0	0	276	0	221
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	63.0			50.0	50.0	27.0	27.0		27.0		13.0
Total Split (%)	14.4%	70.0%			55.6%	55.6%	30.0%	30.0%		30.0%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)	58.7	58.7			45.9	45.9				21.3		34.1
Actuated g/C Ratio	0.65	0.65			0.51	0.51				0.24		0.38
v/c Ratio	0.38	0.49			0.62	0.15				0.90		0.36
Control Delay (s/veh)	9.7	9.1			14.9	3.8				67.0		15.9
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)	9.7	9.1			14.9	3.8				67.0		15.9
LOS	A	A			B	A				E		B
Approach Delay (s/veh)		9.2			13.7						44.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B						D	
Queue Length 50th (ft)	23	154			180	8				151		61
Queue Length 95th (ft)	43	200			259	25				#294		119
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)	350					230				70		
Base Capacity (vph)	311	2196			1734	848				315		609
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.38	0.50			0.62	0.15				0.88		0.36

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay (s/veh): 17.1 Intersection LOS: B
Intersection Capacity Utilization 62.9% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



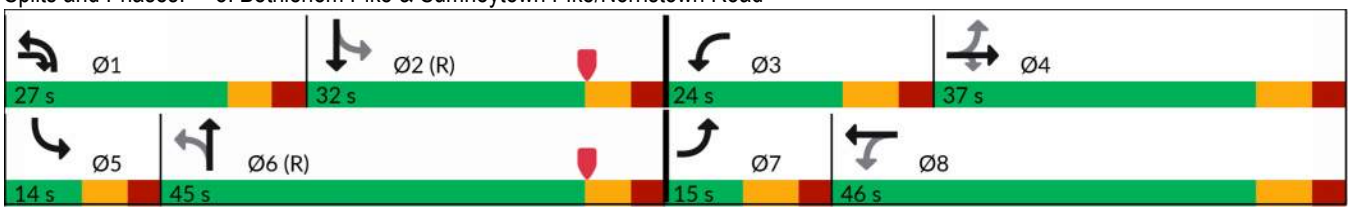
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	790	197	294	820	145	228	485	205	170	427	43
Future Volume (vph)	61	790	197	294	820	145	228	485	205	170	427	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.977			0.955			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3228	0	1604	3173	0	1604	3135	0
Flt Permitted	0.143			0.104			0.254			0.285		
Satd. Flow (perm)	245	3290	1603	185	3228	0	429	3173	0	481	3135	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					57			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	64	832	207	309	863	153	240	511	216	179	449	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	832	207	309	1016	0	240	727	0	179	494	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	37.0	27.0	24.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	30.8%	22.5%	20.0%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	790	197	294	820	145	228	485	205	170	427	43
Future Volume (veh/h)	61	790	197	294	820	145	228	485	205	170	427	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	64	832	155	309	863	153	240	511	179	179	449	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	194	866	598	332	1056	187	435	852	297	297	932	
Arrive On Green	0.05	0.25	0.25	0.14	0.34	0.33	0.12	0.32	0.32	0.07	0.27	0.00
Sat Flow, veh/h	1723	3464	1605	1856	3097	549	1807	2622	914	1750	3555	0
Grp Volume(v), veh/h	64	832	155	309	508	508	240	351	339	179	449	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1605	1856	1825	1821	1807	1803	1733	1750	1732	0
Q Serve(g_s), s	3.2	28.5	8.0	15.2	30.5	30.6	10.8	19.6	19.8	8.0	13.1	0.0
Cycle Q Clear(g_c), s	3.2	28.5	8.0	15.2	30.5	30.6	10.8	19.6	19.8	8.0	13.1	0.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		0.53	1.00		0.00
Lane Grp Cap(c), veh/h	194	866	598	332	622	621	435	586	563	297	932	
V/C Ratio(X)	0.33	0.96	0.26	0.93	0.82	0.82	0.55	0.60	0.60	0.60	0.48	
Avail Cap(c_a), veh/h	221	866	598	332	622	621	529	586	563	297	932	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.3	44.4	26.1	33.3	36.1	36.3	25.2	33.9	34.2	31.8	36.8	0.0
Incr Delay (d2), s/veh	1.0	21.5	0.2	27.4	6.7	6.7	1.1	4.5	4.7	3.4	1.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	20.8	5.4	12.7	19.6	19.6	8.1	14.0	13.8	7.2	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	33.3	66.0	26.4	60.7	42.8	43.0	26.3	38.4	39.0	35.3	38.6	0.0
LnGrp LOS	C	E	C	E	D	D	C	D	D	D	D	
Approach Vol, veh/h		1051			1325			930			628	
Approach Delay, s/veh		58.1			47.1			35.5			37.7	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.7	38.3	24.0	37.0	14.0	45.0	13.1	47.9
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	16.0	29.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	13.3	15.6	17.7	31.0	10.5	22.1	5.7	33.0
Green Ext Time (p_c), s	0.4	1.3	0.0	0.0	0.0	2.3	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	45.8
HCM 6th LOS	D

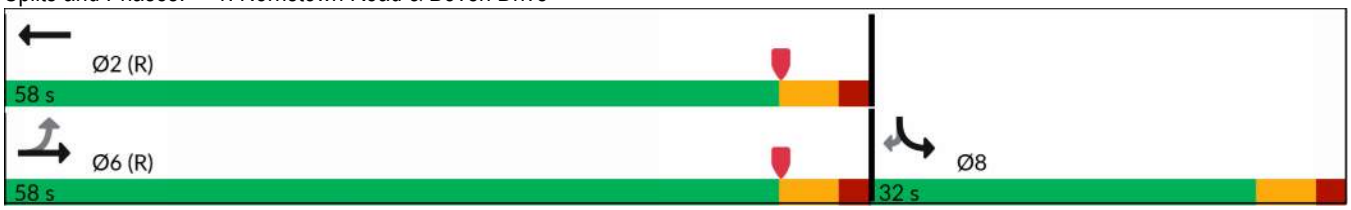
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	597	593	1	2	1
Future Volume (vph)	2	597	593	1	2	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3289	0	1906	1705
Flt Permitted	0.415				0.950	
Satd. Flow (perm)	729	3306	3289	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	628	624	1	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	628	625	0	2	1
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	58.0	58.0	58.0		32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%		35.6%	35.6%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	597	593	1	2	1
Future Volume (veh/h)	2	597	593	1	2	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	2	628	624	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	782	3097	3060	5	27	24
Arrive On Green	0.88	0.88	1.00	1.00	0.01	0.00
Sat Flow, veh/h	802	3628	3582	6	2115	1882
Grp Volume(v), veh/h	2	628	305	320	2	0
Grp Sat Flow(s),veh/h/ln	802	1767	1705	1793	2115	1882
Q Serve(g_s), s	0.0	2.4	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.0	2.4	0.0	0.0	0.1	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	782	3097	1494	1571	27	24
V/C Ratio(X)	0.00	0.20	0.20	0.20	0.07	0.00
Avail Cap(c_a), veh/h	782	3097	1494	1571	635	565
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.0	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.3	1.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.1	0.2	0.2	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.7	1.0	0.3	0.3	45.1	0.0
LnGrp LOS	A	A	A	A	D	
Approach Vol, veh/h		630	625		2	
Approach Delay, s/veh		1.0	0.3		45.1	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	83.9				83.9	6.1
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	52.0				52.0	26.0
Max Q Clear Time (g_c+I1), s	2.0				4.4	2.1
Green Ext Time (p_c), s	19.8				20.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	0.7
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	607	2	1	595	1	2
Future Volume (vph)	607	2	1	595	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	639	2	1	626	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	641	0	0	627	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	607	2	1	595	1	2
Future Vol, veh/h	607	2	1	595	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	639	2	1	626	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	641	0	955	321
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1079	-	*768	*1051
Stage 1	-	-	-	-	*845	-
Stage 2	-	-	-	-	*1034	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1079	-	*767	*1051
Mov Cap-2 Maneuver	-	-	-	-	*767	-
Stage 1	-	-	-	-	*845	-
Stage 2	-	-	-	-	*1033	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	936	-	-	1079	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.9	-	-	8.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	457	0	0	537	39	358	0	173	0	0	0
Future Volume (vph)	7	457	0	0	537	39	358	0	173	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.990				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5896	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5896	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					18				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	7	476	0	0	559	41	373	0	180	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	7	476	0	0	600	0	186	187	180	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		19.0	19.0	19.0			
Total Split (%)	14.4%				37.8%		21.1%	21.1%	21.1%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.6	65.6			32.2		14.4	14.4	14.4			
Actuated g/C Ratio	0.08	0.73			0.36		0.16	0.16	0.16			
v/c Ratio	0.05	0.20			0.28		0.72	0.72	0.45			
Control Delay (s/veh)	29.5	1.1			23.0		53.7	54.0	9.4			
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	29.5	1.3			23.0		53.7	54.0	9.4			
LOS	C	A			C		D	D	A			
Approach Delay (s/veh)		1.8			23.0			39.4				

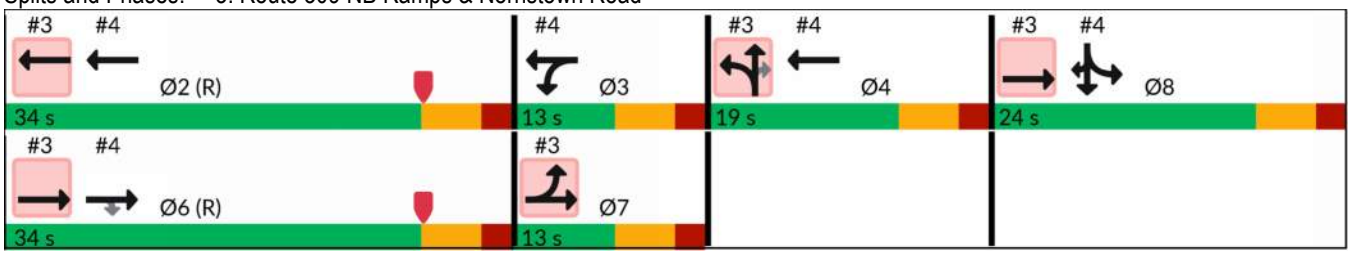
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	24.0
Total Split (%)	14%	38%	27%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			D				
Queue Length 50th (ft)	4	0			75		107	108	0			
Queue Length 95th (ft)	m17	19			91		#212	#213	55			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2324			2123		257	257	395			
Starvation Cap Reductn	0	1027			0		0	0	0			
Spillback Cap Reductn	0	0			40		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.05	0.37			0.29		0.72	0.73	0.46			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay (s/veh): 22.3 Intersection LOS: C
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	401	374	91	858	0	0	0	0	41	0	16
Future Volume (vph)	0	401	374	91	858	0	0	0	0	41	0	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			402									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	431	402	98	923	0	0	0	0	44	0	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	431	402	98	923	0	0	0	0	0	44	17
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						24.0	24.0	24.0
Total Split (%)		37.8%	37.8%	14.4%						26.7%	26.7%	26.7%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.2	32.2	7.6	64.2						15.8	15.8
Actuated g/C Ratio		0.36	0.36	0.08	0.71						0.18	0.18
v/c Ratio		0.26	0.52	0.36	0.40						0.14	0.03
Control Delay (s/veh)		20.2	9.0	47.9	3.1						32.3	0.1
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay (s/veh)		20.2	9.0	47.9	3.5						32.3	0.1
LOS		C	A	D	A						C	A
Approach Delay (s/veh)		14.9			7.9						23.4	

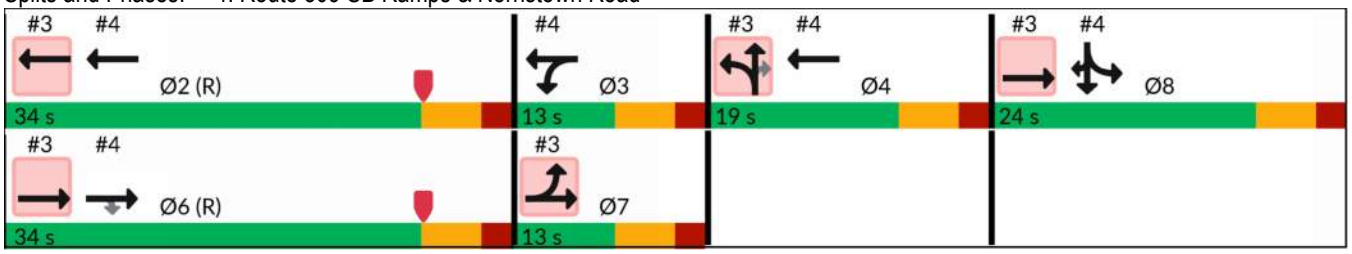
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	19.0	13.0
Total Split (%)	38%	21%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		63	0	31	11						22	0
Queue Length 95th (ft)		94	138	m52	46						49	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1643	762	280	2243						357	506
Starvation Cap Reductn		0	0	0	757						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.26	0.53	0.35	0.62						0.12	0.03

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay (s/veh): 11.4 Intersection LOS: B
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

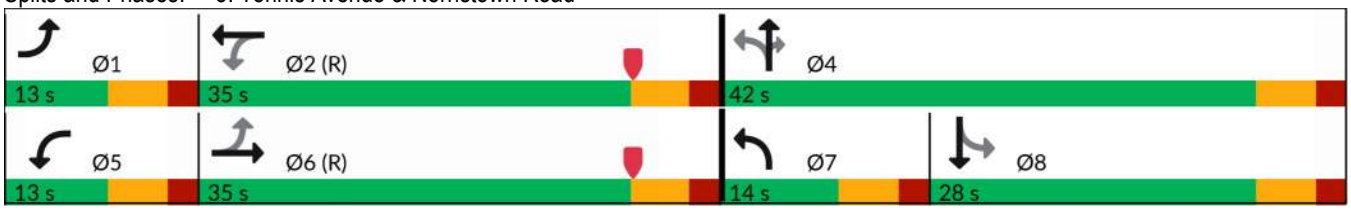
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	431	43	55	402	5	59	84	60	8	84	115
Future Volume (vph)	140	431	43	55	402	5	59	84	60	8	84	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.998				0.850		0.925	
Flt Protected	0.950			0.950				0.980			0.998	
Satd. Flow (prot)	1701	3325	0	1710	1796	0	0	1693	1553	0	1575	0
Flt Permitted	0.410			0.469				0.566			0.986	
Satd. Flow (perm)	734	3325	0	844	1796	0	0	978	1553	0	1556	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		68	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	147	454	45	58	423	5	62	88	63	8	88	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	147	499	0	58	428	0	0	150	63	0	217	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	35.0		13.0	35.0		14.0	42.0	42.0	28.0	28.0	
Total Split (%)	14.4%	38.9%		14.4%	38.9%		15.6%	46.7%	46.7%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	61.1	53.3		56.8	49.3			16.5	16.5		16.5	
Actuated g/C Ratio	0.68	0.59		0.63	0.55			0.18	0.18		0.18	
v/c Ratio	0.24	0.25		0.09	0.43			0.84	0.16		0.63	
Control Delay (s/veh)	3.4	4.0		5.8	15.4			70.4	2.4		30.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	3.4	4.0		5.8	15.4			70.4	2.4		30.9	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		3.9			14.3			50.3			31.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	7	19		9	134			83	0		78	
Queue Length 95th (ft)	25	46		25	261			142	9		139	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	599	1969		617	984			402	702		448	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.25	0.25		0.09	0.43			0.37	0.09		0.48	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay (s/veh): 17.2 Intersection LOS: B
Intersection Capacity Utilization 68.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Tennis Avenue & Norristown Road

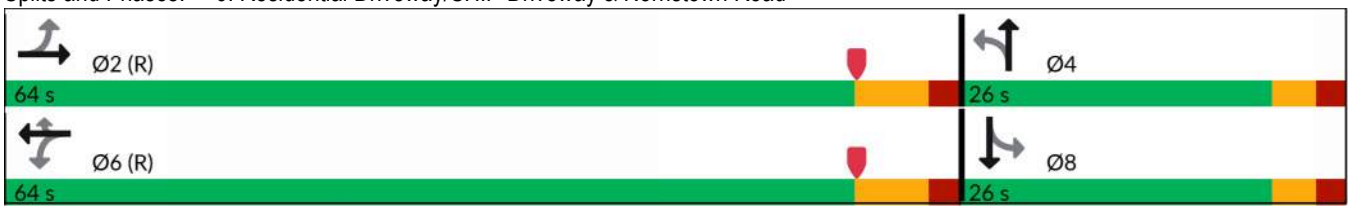


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	749	15	20	749	23	8	0	14	38	0	24
Future Volume (vph)	24	749	15	20	749	23	8	0	14	38	0	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	250		0	0		225	50		50	0		0
Storage Lanes	1		0	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99	0.97						
Frt		0.997				0.850		0.850			0.850	
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	1701	3360	0	0	3434	1553	1701	1522	0	1701	1522	0
Flt Permitted	0.349				0.923		0.741			0.748		
Satd. Flow (perm)	625	3360	0	0	3173	1521	1327	1522	0	1340	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				24		224			223	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	780	16	21	780	24	8	0	15	40	0	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	796	0	0	801	24	8	15	0	40	25	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0	21.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0	28.0	8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0	64.0	26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%	71.1%	28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	749	15	20	749	23	8	0	14	38	0	24
Future Volume (veh/h)	24	749	15	20	749	23	8	0	14	38	0	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	25	780	16	21	780	24	8	0	4	40	0	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	586	2816	58	83	2828	1345	136	0	88	155	0	88
Arrive On Green	0.83	0.83	0.82	0.82	0.83	0.83	0.06	0.00	0.05	0.06	0.00	0.05
Sat Flow, veh/h	650	3390	70	49	3404	1619	1330	0	1521	1355	0	1521
Grp Volume(v), veh/h	25	389	407	421	380	24	8	0	4	40	0	25
Grp Sat Flow(s),veh/h/ln	650	1691	1768	1812	1640	1619	1330	0	1521	1355	0	1521
Q Serve(g_s), s	0.8	4.6	4.6	0.0	4.6	0.2	0.5	0.0	0.2	2.6	0.0	1.4
Cycle Q Clear(g_c), s	5.4	4.6	4.6	4.4	4.6	0.2	2.0	0.0	0.2	2.8	0.0	1.4
Prop In Lane	1.00		0.04	0.05		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	586	1405	1469	1528	1363	1345	136	0	88	155	0	88
V/C Ratio(X)	0.04	0.28	0.28	0.28	0.28	0.02	0.06	0.00	0.05	0.26	0.00	0.28
Avail Cap(c_a), veh/h	586	1405	1469	1528	1363	1345	384	0	372	408	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.3	1.7	1.7	1.7	1.7	1.3	41.5	0.0	40.5	41.4	0.0	41.1
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.4	0.5	0.0	0.2	0.0	0.2	0.9	0.0	1.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	1.0	1.0	1.3	1.0	0.0	0.3	0.0	0.2	1.6	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	2.4	2.1	2.1	2.1	2.2	1.3	41.7	0.0	40.7	42.2	0.0	42.8
LnGrp LOS	A	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		821			825			12			65	
Approach Delay, s/veh		2.1			2.1			41.4			42.4	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	80.8	9.2	80.8	9.2
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	7.4	4.0	2.2	4.8
Green Ext Time (p_c), s	0.2	0.0	0.2	0.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.9
HCM 6th LOS	A

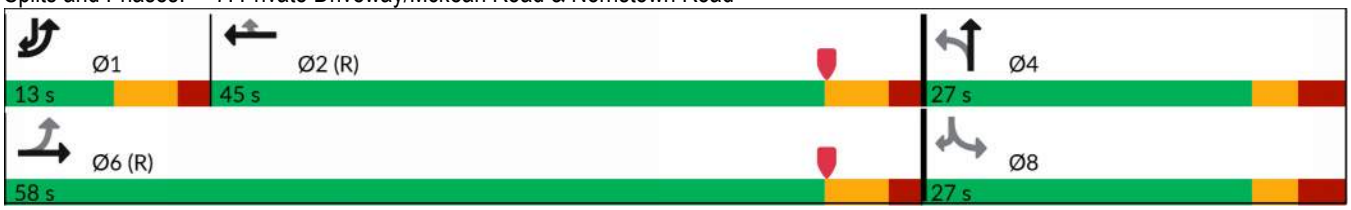
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	567	0	0	564	74	0	0	0	95	0	115
Future Volume (vph)	106	567	0	0	564	74	0	0	0	95	0	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	350		0	0		230	0		0	70		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1701	3369	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted	0.362									0.757		
Satd. Flow (perm)	648	3369	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						125
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	115	616	0	0	613	80	0	0	0	103	0	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	616	0	0	613	80	0	0	0	103	0	125
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	58.0			45.0	45.0	27.0	27.0		27.0		13.0
Total Split (%)	15.3%	68.2%			52.9%	52.9%	31.8%	31.8%		31.8%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)	64.5	65.5			51.2	51.2				13.1		23.8
Actuated g/C Ratio	0.76	0.77			0.60	0.60				0.15		0.28
v/c Ratio	0.19	0.23			0.30	0.08				0.51		0.24
Control Delay (s/veh)	4.7	4.2			10.4	1.2				41.3		4.7
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)	4.7	4.2			10.4	1.2				41.3		4.7
LOS	A	A			B	A				D		A
Approach Delay (s/veh)		4.4			9.4						21.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						C	
Queue Length 50th (ft)	15	47			82	0				51		0
Queue Length 95th (ft)	37	85			142	11				94		32
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)	350					230				70		
Base Capacity (vph)	598	2594			2030	972				334		516
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.19	0.24			0.30	0.08				0.31		0.24

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay (s/veh): 8.8 Intersection LOS: A
Intersection Capacity Utilization 39.9% ICU Level of Service A
Analysis Period (min) 15

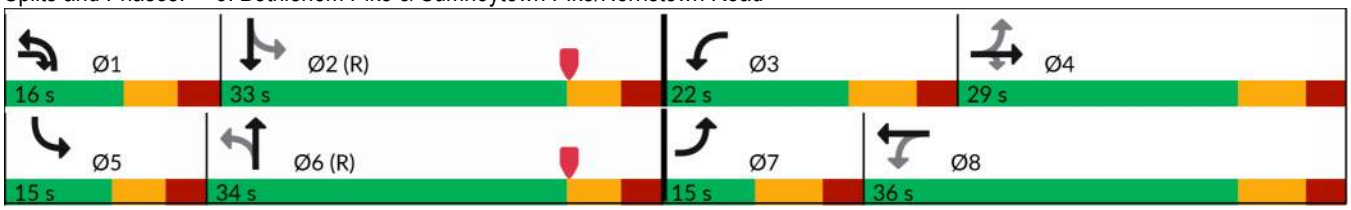
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	419	177	133	429	106	167	440	125	168	437	65
Future Volume (vph)	58	419	177	133	429	106	167	440	125	168	437	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.970			0.967			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3245	0	1558	3220	0	1604	3147	0
Flt Permitted	0.385			0.299			0.339			0.300		
Satd. Flow (perm)	641	3290	1624	531	3245	0	556	3220	0	507	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			190					36			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	62	451	190	143	461	114	180	473	134	181	470	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	451	190	143	575	0	180	607	0	181	540	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	15.0	29.0	16.0	22.0	36.0		16.0	34.0		15.0	33.0	
Total Split (%)	15.0%	29.0%	16.0%	22.0%	36.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	419	177	133	429	106	167	440	125	168	437	65
Future Volume (veh/h)	58	419	177	133	429	106	167	440	125	168	437	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	62	451	149	143	461	110	180	473	120	181	470	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	219	598	430	298	630	149	495	1087	274	439	1314	
Arrive On Green	0.05	0.17	0.17	0.10	0.21	0.20	0.09	0.38	0.37	0.09	0.38	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2948	699	1767	2852	719	1750	3583	0
Grp Volume(v), veh/h	62	451	149	143	286	285	180	298	295	181	470	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1809	1767	1803	1768	1750	1745	0
Q Serve(g_s), s	3.0	12.4	7.5	6.1	14.5	14.7	6.0	12.2	12.5	6.2	9.7	0.0
Cycle Q Clear(g_c), s	3.0	12.4	7.5	6.1	14.5	14.7	6.0	12.2	12.5	6.2	9.7	0.0
Prop In Lane	1.00		1.00	1.00		0.39	1.00		0.41	1.00		0.00
Lane Grp Cap(c), veh/h	219	598	430	298	393	387	495	687	674	439	1314	
V/C Ratio(X)	0.28	0.75	0.35	0.48	0.73	0.74	0.36	0.43	0.44	0.41	0.36	
Avail Cap(c_a), veh/h	261	762	506	398	533	525	505	687	674	439	1314	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.6	39.3	29.6	29.9	36.6	36.9	16.2	22.9	23.1	16.8	22.5	0.0
Incr Delay (d2), s/veh	0.7	3.2	0.5	1.2	3.2	3.5	0.4	2.0	2.1	0.6	0.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	9.2	5.1	4.8	10.7	10.7	4.2	9.1	9.1	4.3	7.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.3	42.6	30.1	31.0	39.8	40.3	16.6	24.9	25.2	17.4	23.2	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	B	C	
Approach Vol, veh/h		662			714			773			651	
Approach Delay, s/veh		38.8			38.2			23.1			21.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	43.7	16.6	24.3	15.0	44.1	12.5	28.4
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	14.0	21.0	8.0	27.0	7.0	28.0
Max Q Clear Time (g_c+I1), s	8.5	12.2	8.6	14.9	8.7	14.7	5.5	17.0
Green Ext Time (p_c), s	0.0	1.6	0.2	1.4	0.0	1.8	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	30.3
HCM 6th LOS	C

Notes

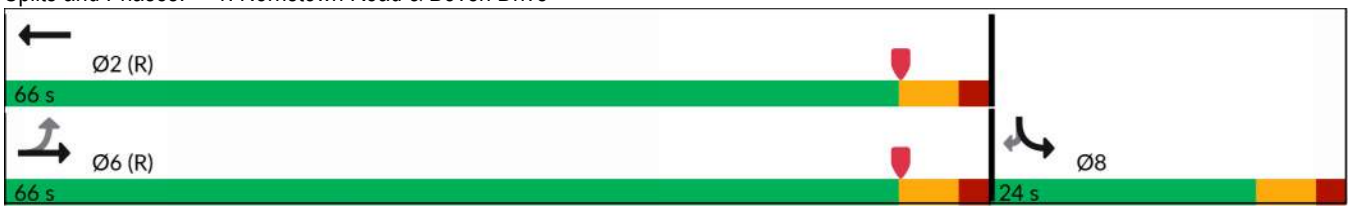
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2032 Projected Conditions With SHIP Development

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	744	802	59	50	111
Future Volume (vph)	147	744	802	59	50	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3169	0	1906	1137
Flt Permitted	0.311				0.950	
Satd. Flow (perm)	547	3211	3169	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			116
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	153	775	835	61	52	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	775	896	0	52	116
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	66.0	66.0	66.0		24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%		26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	744	802	59	50	111
Future Volume (veh/h)	147	744	802	59	50	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	153	775	835	61	52	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	556	2642	2426	177	262	156
Arrive On Green	0.76	0.76	1.00	1.00	0.12	0.12
Sat Flow, veh/h	623	3544	3259	232	2115	1255
Grp Volume(v), veh/h	153	775	442	454	52	115
Grp Sat Flow(s),veh/h/ln	623	1727	1678	1725	2115	1255
Q Serve(g_s), s	6.9	6.1	0.0	0.0	2.0	8.0
Cycle Q Clear(g_c), s	6.9	6.1	0.0	0.0	2.0	8.0
Prop In Lane	1.00			0.13	1.00	1.00
Lane Grp Cap(c), veh/h	556	2642	1284	1319	262	156
V/C Ratio(X)	0.28	0.29	0.34	0.34	0.20	0.74
Avail Cap(c_a), veh/h	556	2642	1284	1319	447	265
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.3	3.2	0.0	0.0	35.4	38.0
Incr Delay (d2), s/veh	1.2	0.3	0.7	0.7	0.4	6.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	2.3	0.5	0.5	1.9	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.5	3.5	0.7	0.7	35.8	44.7
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		928	896		167	
Approach Delay, s/veh		3.7	0.7		41.9	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.8				73.8	16.2
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	60.0				60.0	18.0
Max Q Clear Time (g_c+I1), s	2.0				8.1	10.0
Green Ext Time (p_c), s	33.2				24.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.5
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	800	1	0	865	3	2
Future Volume (vph)	800	1	0	865	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.946	
Flt Protected					0.971	
Satd. Flow (prot)	3149	0	0	3353	1717	0
Flt Permitted					0.971	
Satd. Flow (perm)	3149	0	0	3353	1717	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	2%	0%	0%
Adj. Flow (vph)	842	1	0	911	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	843	0	0	911	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	800	1	0	865	3	2
Future Vol, veh/h	800	1	0	865	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	0	0	2	0	0
Mvmt Flow	842	1	0	911	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	843	0	1299	422
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	946	-	*624	*999
Stage 1	-	-	-	-	*708	-
Stage 2	-	-	-	-	*872	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	946	-	*624	*999
Mov Cap-2 Maneuver	-	-	-	-	*624	-
Stage 1	-	-	-	-	*708	-
Stage 2	-	-	-	-	*872	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	734	-	-	946	-
HCM Lane V/C Ratio	0.007	-	-	-	-
HCM Control Delay (s/veh)	9.9	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	620	0	0	885	28	834	0	277	0	0	0
Future Volume (vph)	6	620	0	0	885	28	834	0	277	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.995				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1316	3103	0	0	5806	0	1601	1601	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1316	3103	0	0	5806	0	1601	1601	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					6				255			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	25%	6%	0%	0%	2%	4%	3%	0%	2%	0%	0%	0%
Adj. Flow (vph)	6	633	0	0	903	29	851	0	283	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	6	633	0	0	932	0	425	426	283	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				22.0		34.0	34.0	34.0			
Total Split (%)	14.4%				24.4%		37.8%	37.8%	37.8%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	8.0	51.0			17.0		29.0	29.0	29.0			
Actuated g/C Ratio	0.09	0.57			0.19		0.32	0.32	0.32			
v/c Ratio	0.05	0.36			0.84		0.82	0.82	0.42			
Control Delay (s/veh)	15.1	2.8			33.5		43.5	43.7	6.4			
Queue Delay	0.0	0.4			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	15.1	3.3			33.5		43.5	43.7	6.4			

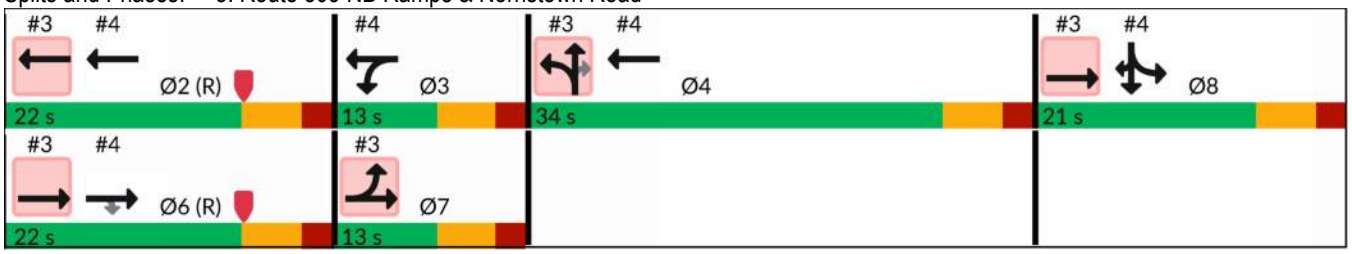
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	15.0
Minimum Split (s)	9.0	21.0	21.0
Total Split (s)	13.0	22.0	21.0
Total Split (%)	14%	24%	23%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			C		D	D	A			
Approach Delay (s/veh)		3.4			33.5			34.4				
Approach LOS		A			C			C				
Queue Length 50th (ft)	4	44			110		232	233	11			
Queue Length 95th (ft)	m5	61			#150		#398	#401	68			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	116	1758			1101		515	515	663			
Starvation Cap Reductn	0	661			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.05	0.58			0.85		0.83	0.83	0.43			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 26.8 Intersection LOS: C
Intersection Capacity Utilization 97.4% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	590	551	190	1526	0	0	0	0	50	0	29
Future Volume (vph)	0	590	551	190	1526	0	0	0	0	50	0	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor											0.99	0.98
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4501	1366	3159	3194	0	0	0	0	0	1571	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4501	1366	3159	3194	0	0	0	0	0	1569	1693
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			557									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Confl. Peds. (#/hr)										1		1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	5%	4%	1%	3%	0%	0%	0%	0%	11%	0%	0%
Adj. Flow (vph)	0	596	557	192	1541	0	0	0	0	51	0	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	596	557	192	1541	0	0	0	0	0	51	29
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									8
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						15.0	15.0	15.0
Minimum Split (s)		21.0	21.0	9.0						21.0	21.0	21.0
Total Split (s)		22.0	22.0	13.0						21.0	21.0	21.0
Total Split (%)		24.4%	24.4%	14.4%						23.3%	23.3%	23.3%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		17.0	17.0	8.0	64.0						16.0	16.0
Actuated g/C Ratio		0.19	0.19	0.09	0.71						0.18	0.18
v/c Ratio		0.70	0.78	0.68	0.67						0.18	0.06
Control Delay (s/veh)		36.0	18.5	45.6	3.9						33.4	0.2
Queue Delay		0.0	0.0	0.0	21.8						0.0	0.0
Total Delay (s/veh)		36.0	18.5	45.6	25.7						33.4	0.2

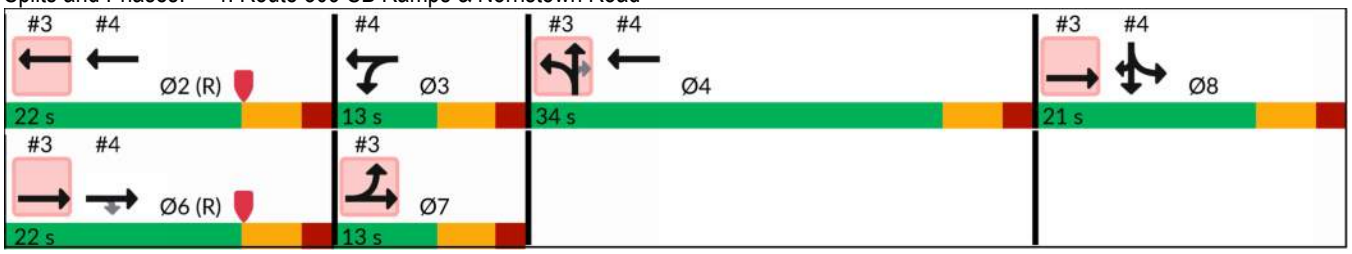
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	22.0	34.0	13.0
Total Split (%)	24%	38%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		D	B	D	C						C	A
Approach Delay (s/veh)		27.6			27.9						21.4	
Approach LOS		C			C						C	
Queue Length 50th (ft)		118	84	61	97						25	0
Queue Length 95th (ft)		157	#275	m74	98						58	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		850	709	280	2271						279	454
Starvation Cap Reductn		0	0	0	779						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.70	0.79	0.69	1.03						0.18	0.06

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 27.6 Intersection LOS: C
Intersection Capacity Utilization 97.4% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

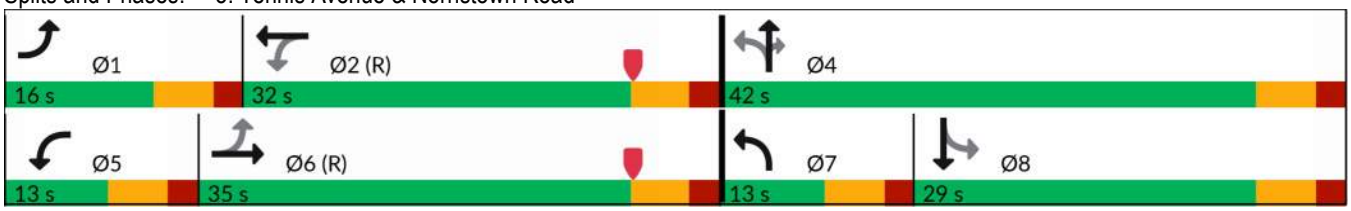
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	498	56	104	424	4	91	95	89	3	168	284
Future Volume (vph)	244	498	56	104	424	4	91	95	89	3	168	284
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99	0.99						0.99	
Frt		0.985			0.999				0.850		0.916	
Flt Protected	0.950			0.950				0.976				
Satd. Flow (prot)	1652	3210	0	1613	1759	0	0	1642	1465	0	1517	0
Flt Permitted	0.159			0.375				0.550			0.999	
Satd. Flow (perm)	276	3210	0	636	1759	0	0	925	1465	0	1516	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)									109		91	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Confl. Peds. (#/hr)				1		1				1		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	8%	6%	2%	25%	6%	4%	6%	67%	4%	2%
Adj. Flow (vph)	265	541	61	113	461	4	99	103	97	3	183	309
Shared Lane Traffic (%)												
Lane Group Flow (vph)	265	602	0	113	465	0	0	202	97	0	495	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	16.0	35.0		13.0	32.0		13.0	42.0	42.0	29.0	29.0	
Total Split (%)	17.8%	38.9%		14.4%	35.6%		14.4%	46.7%	46.7%	32.2%	32.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	41.4	32.6		34.9	27.0			37.0	37.0		37.0	
Actuated g/C Ratio	0.46	0.36		0.39	0.30			0.41	0.41		0.41	
v/c Ratio	0.90	0.51		0.34	0.88			0.53	0.14		0.73	
Control Delay (s/veh)	64.8	12.2		16.7	50.4			26.3	3.4		25.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	64.8	12.2		16.7	50.4			26.3	3.4		25.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B		B	D			C	A		C	
Approach Delay (s/veh)		28.3			43.8			18.9			25.6	
Approach LOS		C			D			B			C	
Queue Length 50th (ft)	110	66		35	250			84	0		190	
Queue Length 95th (ft)	#243	93		66	#426			156	24		316	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	294	1163		334	527			380	666		676	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.90	0.52		0.34	0.88			0.53	0.15		0.73	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay (s/veh): 30.5 Intersection LOS: C
Intersection Capacity Utilization 93.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

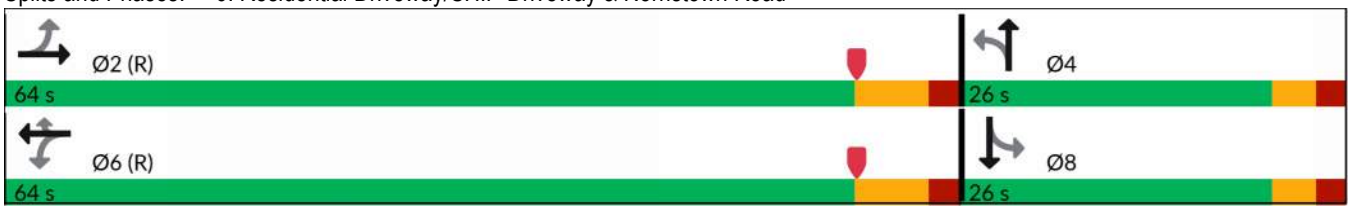
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1132	21	17	1268	171	7	0	10	57	0	42
Future Volume (vph)	191	1132	21	17	1268	171	7	0	10	57	0	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	250		0	0		225	50		50	0		0
Storage Lanes	1		0	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850		0.850			0.850	
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	1701	3262	0	0	3365	1553	1701	1269	0	1492	1522	0
Flt Permitted	0.188				0.928		0.729			0.751		
Satd. Flow (perm)	337	3262	0	0	3126	1553	1306	1269	0	1180	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				176		99			73	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	5%	6%	3%	0%	0%	0%	20%	14%	0%	0%
Adj. Flow (vph)	197	1167	22	18	1307	176	7	0	10	59	0	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	1189	0	0	1325	176	7	10	0	59	43	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0	21.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0	28.0	8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0	64.0	26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%	71.1%	28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	1132	21	17	1268	171	7	0	10	57	0	42
Future Volume (veh/h)	191	1132	21	17	1268	171	7	0	10	57	0	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1738	1724	1826	1869	1912	1794	1794	1514	1598	1794	1794
Adj Flow Rate, veh/h	197	1167	21	18	1307	176	7	0	3	59	0	39
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	5	6	3	0	0	0	20	14	0	0
Cap, veh/h	315	2684	48	56	2758	1310	153	0	122	175	0	122
Arrive On Green	0.81	0.81	0.80	0.80	0.81	0.81	0.08	0.00	0.07	0.08	0.00	0.07
Sat Flow, veh/h	341	3319	60	19	3411	1620	1313	0	1521	1208	0	1521
Grp Volume(v), veh/h	197	581	607	704	621	176	7	0	3	59	0	39
Grp Sat Flow(s),veh/h/ln	341	1651	1728	1814	1616	1620	1313	0	1521	1208	0	1521
Q Serve(g_s), s	38.2	9.3	9.4	0.0	10.8	2.1	0.5	0.0	0.2	4.3	0.0	2.2
Cycle Q Clear(g_c), s	49.0	9.3	9.4	10.5	10.8	2.1	2.7	0.0	0.2	4.4	0.0	2.2
Prop In Lane	1.00		0.03	0.03		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	315	1335	1397	1487	1306	1310	153	0	122	175	0	122
V/C Ratio(X)	0.63	0.43	0.43	0.47	0.48	0.13	0.05	0.00	0.02	0.34	0.00	0.32
Avail Cap(c_a), veh/h	315	1335	1397	1487	1306	1310	369	0	372	373	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.3	2.5	2.6	2.7	2.7	1.9	40.3	0.0	38.6	40.2	0.0	39.5
Incr Delay (d2), s/veh	7.5	0.8	0.8	1.1	1.2	0.2	0.1	0.0	0.1	1.1	0.0	1.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	2.6	2.7	3.9	3.1	0.6	0.3	0.0	0.1	2.3	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.8	3.4	3.4	3.7	3.9	2.1	40.4	0.0	38.7	41.3	0.0	41.0
LnGrp LOS	B	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		1385			1501			10			98	
Approach Delay, s/veh		5.4			3.6			39.9			41.2	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		78.8		11.2		78.8		11.2				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		57.0		21.0		57.0		21.0				
Max Q Clear Time (g_c+I1), s		51.0		4.7		4.1		6.4				
Green Ext Time (p_c), s		0.3		0.0		0.3		0.3				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			5.8									
HCM 6th LOS			A									

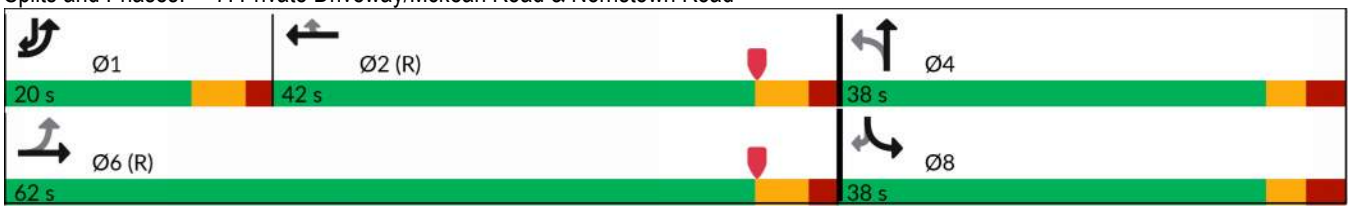
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1141	0	0	927	244	0	0	0	171	0	120
Future Volume (vph)	200	1141	0	0	927	244	0	0	0	171	0	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	350		0	0		230	0		0	70		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1685	3336	0	0	3370	1522	0	1800	0	1604	0	1470
Flt Permitted	0.175									0.950		
Satd. Flow (perm)	310	3336	0	0	3370	1522	0	1800	0	1604	0	1470
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						274						33
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	2%
Adj. Flow (vph)	225	1282	0	0	1042	274	0	0	0	192	0	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	1282	0	0	1042	274	0	0	0	192	0	135
Turn Type	pm+pt	NA			NA	Perm				Prot		pm+ov
Protected Phases	1	6			2			4!		8!		1
Permitted Phases	6					2	4					8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	20.0	62.0			42.0	42.0	38.0	38.0		38.0		20.0
Total Split (%)	20.0%	62.0%			42.0%	42.0%	38.0%	38.0%		38.0%		20.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)	71.7	71.7			52.3	52.3				18.3		37.7
Actuated g/C Ratio	0.72	0.72			0.52	0.52				0.18		0.38
v/c Ratio	0.53	0.53			0.59	0.29				0.65		0.23
Control Delay (s/veh)	11.1	8.2			20.2	3.3				47.8		14.6
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)	11.1	8.2			20.2	3.3				47.8		14.6
LOS	B	A			C	A				D		B
Approach Delay (s/veh)		8.6			16.8						34.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B						C	
Queue Length 50th (ft)	40	170			227	0				115		43
Queue Length 95th (ft)	92	273			382	48				172		65
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)	350					230				70		
Base Capacity (vph)	450	2390			1763	927				529		607
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.50	0.54			0.59	0.30				0.36		0.22

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay (s/veh): 14.7 Intersection LOS: B
Intersection Capacity Utilization 60.4% ICU Level of Service B
Analysis Period (min) 15
! Phase conflict between lane groups.

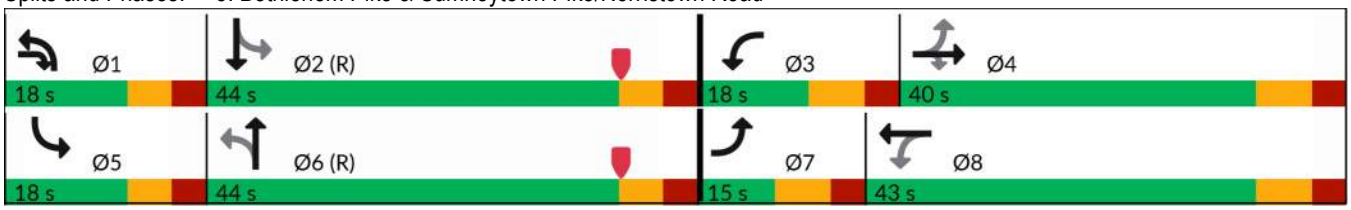
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	956	289	188	754	77	206	268	279	177	400	58
Future Volume (vph)	50	956	289	188	754	77	206	268	279	177	400	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.986			0.923			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	3257	1562	1669	3231	0	1528	2993	0	1588	3033	0
Flt Permitted	0.159			0.103			0.365			0.300		
Satd. Flow (perm)	262	3257	1562	181	3231	0	587	2993	0	502	3033	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			175					226			14	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	5%	1%	3%	2%	6%	4%	3%	1%	4%	2%
Adj. Flow (vph)	54	1028	311	202	811	83	222	288	300	190	430	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	1028	311	202	894	0	222	588	0	190	492	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	40.0	18.0	18.0	43.0		18.0	44.0		18.0	44.0	
Total Split (%)	12.5%	33.3%	15.0%	15.0%	35.8%		15.0%	36.7%		15.0%	36.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	956	289	188	754	77	206	268	279	177	400	58
Future Volume (veh/h)	50	956	289	188	754	77	206	268	279	177	400	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1809	1837	1935	1906	1997	1826	1855	1944	1823	1780	1881
Adj Flow Rate, veh/h	54	1028	229	202	811	83	222	288	248	190	430	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	2	5	1	3	2	6	4	3	1	4	2
Cap, veh/h	194	945	584	229	1068	109	437	577	482	392	1071	
Arrive On Green	0.04	0.28	0.28	0.09	0.32	0.31	0.10	0.32	0.31	0.10	0.32	0.00
Sat Flow, veh/h	1669	3437	1557	1843	3317	339	1739	1821	1522	1736	3472	0
Grp Volume(v), veh/h	54	1028	229	202	443	451	222	278	258	190	430	0
Grp Sat Flow(s),veh/h/ln	1669	1718	1557	1843	1811	1845	1739	1762	1581	1736	1691	0
Q Serve(g_s), s	2.7	33.0	12.9	9.2	26.3	26.4	10.2	15.4	16.1	8.6	11.9	0.0
Cycle Q Clear(g_c), s	2.7	33.0	12.9	9.2	26.3	26.4	10.2	15.4	16.1	8.6	11.9	0.0
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.96	1.00		0.00
Lane Grp Cap(c), veh/h	194	945	584	229	583	594	437	558	501	392	1071	
V/C Ratio(X)	0.28	1.09	0.39	0.88	0.76	0.76	0.51	0.50	0.51	0.48	0.40	
Avail Cap(c_a), veh/h	231	945	584	229	583	594	437	558	501	392	1071	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	43.5	27.5	31.1	36.5	36.6	24.2	33.3	33.9	24.2	32.1	0.0
Incr Delay (d2), s/veh	0.8	56.1	0.4	26.4	4.8	4.7	1.0	3.2	3.7	0.9	1.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	30.1	8.3	9.1	17.1	17.3	7.6	11.2	10.8	6.3	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.4	99.6	27.9	57.4	41.3	41.3	25.1	36.4	37.6	25.2	33.2	0.0
LnGrp LOS	C	F	C	E	D	D	C	D	D	C	C	
Approach Vol, veh/h		1311			1096			758			620	
Approach Delay, s/veh		84.3			44.3			33.5			30.7	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	44.0	18.0	40.0	18.0	44.0	12.4	45.6
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	11.0	37.0	10.0	32.0	11.0	37.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	12.7	14.4	11.7	35.5	11.1	18.1	5.2	28.8
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	1.9	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	53.8
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	1187	599	62	94	168
Future Volume (vph)	151	1187	599	62	94	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.986			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3186	0	1906	1705
Flt Permitted	0.327				0.950	
Satd. Flow (perm)	575	3274	3186	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20			189
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	191	1503	758	78	119	213
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	1503	836	0	119	213
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	56.0	56.0	56.0		34.0	34.0
Total Split (%)	62.2%	62.2%	62.2%		37.8%	37.8%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	1187	599	62	94	168
Future Volume (veh/h)	151	1187	599	62	94	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	191	1503	758	78	119	203
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	567	2595	2273	234	315	280
Arrive On Green	0.74	0.74	1.00	1.00	0.15	0.15
Sat Flow, veh/h	659	3600	3160	316	2115	1882
Grp Volume(v), veh/h	191	1503	414	422	119	203
Grp Sat Flow(s),veh/h/ln	659	1754	1678	1709	2115	1882
Q Serve(g_s), s	9.6	17.6	0.0	0.0	4.6	9.3
Cycle Q Clear(g_c), s	9.6	17.6	0.0	0.0	4.6	9.3
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	567	2595	1242	1265	315	280
V/C Ratio(X)	0.34	0.58	0.33	0.33	0.38	0.72
Avail Cap(c_a), veh/h	567	2595	1242	1265	682	606
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.3	5.3	0.0	0.0	34.5	36.5
Incr Delay (d2), s/veh	1.6	0.9	0.7	0.7	0.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	7.6	0.4	0.4	4.3	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.9	6.3	0.7	0.7	35.3	40.1
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1694	836		322	
Approach Delay, s/veh		6.2	0.7		38.3	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	71.6				71.6	18.4
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	50.0				50.0	28.0
Max Q Clear Time (g_c+I1), s	2.0				19.6	11.3
Green Ext Time (p_c), s	27.4				28.5	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.2
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1316	2	1	659	3	1
Future Volume (vph)	1316	2	1	659	3	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.973	
Flt Protected					0.962	
Satd. Flow (prot)	3241	0	0	3353	1750	0
Flt Permitted					0.962	
Satd. Flow (perm)	3241	0	0	3353	1750	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	1567	2	1	785	4	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1569	0	0	786	5	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1316	2	1	659	3	1
Future Vol, veh/h	1316	2	1	659	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	1567	2	1	785	4	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1569	0	1963	785
Stage 1	-	-	-	-	1568	-
Stage 2	-	-	-	-	395	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	513	-	*95	*844
Stage 1	-	-	-	-	*301	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	513	-	*94	*844
Mov Cap-2 Maneuver	-	-	-	-	*94	-
Stage 1	-	-	-	-	*301	-
Stage 2	-	-	-	-	*991	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	36
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	-	-	513	-
HCM Lane V/C Ratio	0.039	-	-	0.002	-
HCM Control Delay (s/veh)	36	-	-	12	0
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1120	0	0	697	63	393	0	204	0	0	0
Future Volume (vph)	24	1120	0	0	697	63	393	0	204	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.988				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3225	0	0	5755	0	1585	1585	1479	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3225	0	0	5755	0	1585	1585	1479	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					23				182			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	0%	0%	2%	5%	4%	0%	5%	0%	0%	0%
Adj. Flow (vph)	29	1366	0	0	850	77	479	0	249	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	29	1366	0	0	927	0	239	240	249	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	15.0				32.0		23.0	23.0	23.0			
Total Split (%)	16.7%				35.6%		25.6%	25.6%	25.6%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	10.0	62.0			27.0		18.0	18.0	18.0			
Actuated g/C Ratio	0.11	0.69			0.30		0.20	0.20	0.20			
v/c Ratio	0.15	0.61			0.53		0.75	0.75	0.56			
Control Delay (s/veh)	29.9	6.5			18.0		50.6	50.8	15.4			
Queue Delay	0.0	1.4			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	29.9	7.9			18.0		50.6	50.8	15.4			
LOS	C	A			B		D	D	B			
Approach Delay (s/veh)		8.4			18.0			38.7				

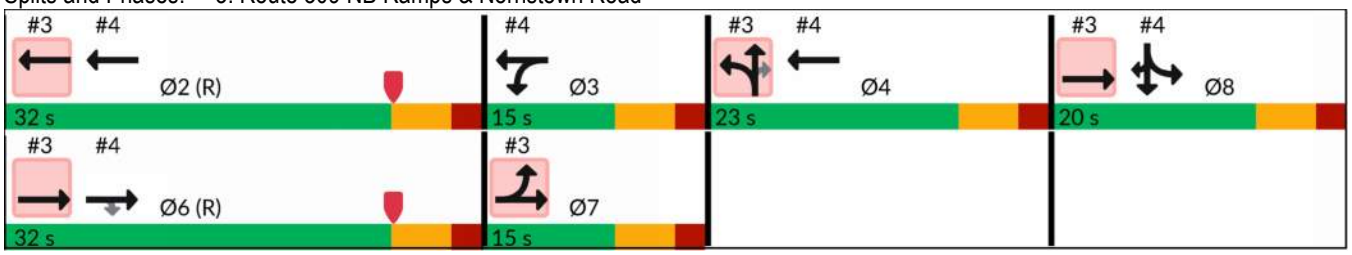
Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	15.0	32.0	20.0
Total Split (%)	17%	36%	22%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D				
Queue Length 50th (ft)	17	113			84		135	136	32			
Queue Length 95th (ft)	m34	69			89		#213	#214	84			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	182	2221			1742		317	317	441			
Starvation Cap Reductn	0	611			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.16	0.85			0.53		0.75	0.76	0.56			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay (s/veh): 18.6 Intersection LOS: B
Intersection Capacity Utilization 109.8% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	749	946	187	1008	0	0	0	0	28	2	9
Future Volume (vph)	0	749	946	187	1008	0	0	0	0	28	2	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.955	
Satd. Flow (prot)	0	4680	1407	3159	3257	0	0	0	0	0	1690	1717
Flt Permitted				0.950							0.955	
Satd. Flow (perm)	0	4680	1407	3159	3257	0	0	0	0	0	1690	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			863									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	0	788	996	197	1061	0	0	0	0	29	2	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	788	996	197	1061	0	0	0	0	0	31	9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		32.0	32.0	15.0						20.0	20.0	20.0
Total Split (%)		35.6%	35.6%	16.7%						22.2%	22.2%	22.2%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		27.0	27.0	10.0	65.0						15.0	15.0
Actuated g/C Ratio		0.30	0.30	0.11	0.72						0.17	0.17
v/c Ratio		0.56	0.97	0.56	0.45						0.11	0.02
Control Delay (s/veh)		21.2	30.0	44.0	2.3						33.1	0.1
Queue Delay		0.0	0.0	0.0	0.6						0.0	0.0
Total Delay (s/veh)		21.3	30.0	44.0	3.0						33.1	0.1
LOS		C	C	D	A						C	A
Approach Delay (s/veh)		26.2			9.4						25.7	

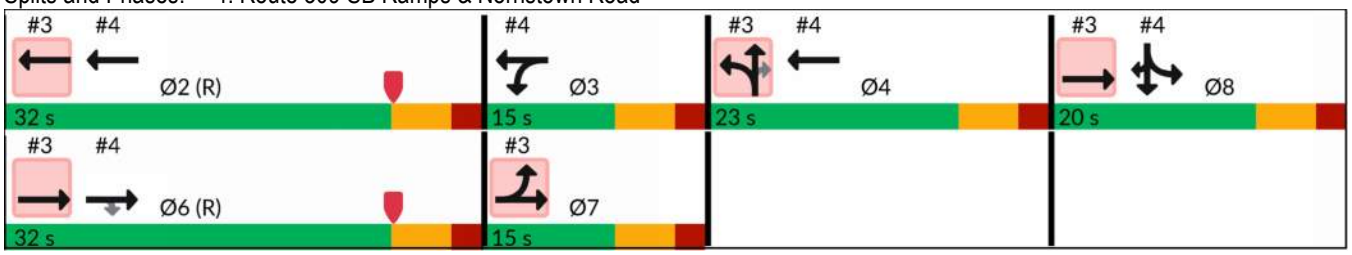
Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	32.0	23.0	15.0
Total Split (%)	36%	26%	17%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A						C	
Queue Length 50th (ft)		142	373	63	23						15	0
Queue Length 95th (ft)		m157	m#445	m94	32						40	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1404	1026	351	2352						281	437
Starvation Cap Reductn		0	0	0	856						0	0
Spillback Cap Reductn		69	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.59	0.97	0.56	0.71						0.11	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay (s/veh): 19.3 Intersection LOS: B
Intersection Capacity Utilization 109.8% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

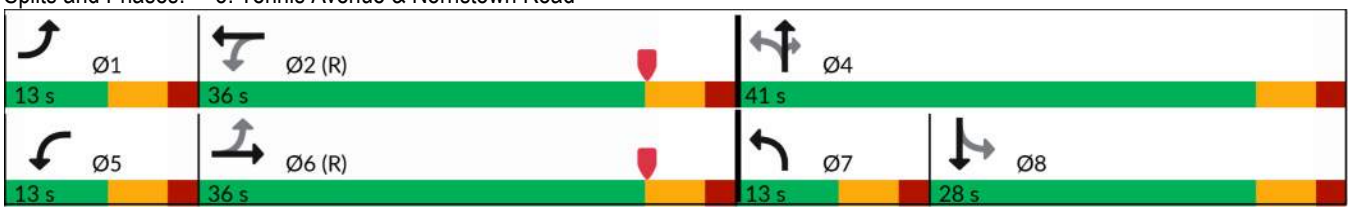
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	580	436	75	407	13	77	154	86	8	124	168
Future Volume (vph)	300	580	436	75	407	13	77	154	86	8	124	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.936			0.995				0.850		0.924	
Flt Protected	0.950			0.950				0.984			0.999	
Satd. Flow (prot)	1652	3123	0	1693	1736	0	0	1671	1493	0	1561	0
Flt Permitted	0.206			0.148				0.675			0.990	
Satd. Flow (perm)	358	3123	0	264	1736	0	0	1146	1493	0	1547	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					2				109		69	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	2%	1%	3%	8%	2%	5%	4%	13%	1%	2%
Adj. Flow (vph)	337	652	490	84	457	15	87	173	97	9	139	189
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	1142	0	84	472	0	0	260	97	0	337	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	36.0		13.0	36.0		13.0	41.0	41.0	28.0	28.0	
Total Split (%)	14.4%	40.0%		14.4%	40.0%		14.4%	45.6%	45.6%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	48.7	40.2		38.9	31.0			29.2	29.2		29.2	
Actuated g/C Ratio	0.54	0.45		0.43	0.34			0.32	0.32		0.32	
v/c Ratio	0.83	0.81		0.35	0.78			0.70	0.17		0.61	
Control Delay (s/veh)	38.8	21.4		15.7	37.6			36.0	3.8		24.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	38.8	21.4		15.7	37.6			36.0	3.8		24.1	
LOS	D	C		B	D			D	A		C	
Approach Delay (s/veh)		25.4			34.4			27.3			24.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	101	166		21	238			125	0		123	
Queue Length 95th (ft)	#319	#491		49	#384			190	24		188	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	406	1393		247	599			458	662		563	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.83	0.82		0.34	0.79			0.57	0.15		0.60	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 27.3 Intersection LOS: C
Intersection Capacity Utilization 88.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

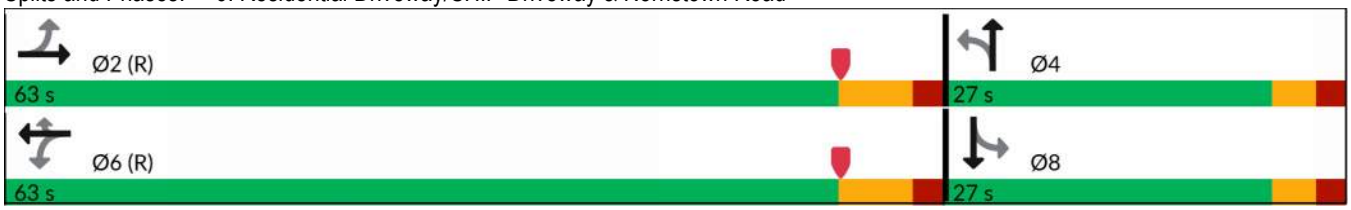
Splits and Phases: 5: Tennis Avenue & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1365	15	15	1028	37	13	0	39	259	0	203
Future Volume (vph)	39	1365	15	15	1028	37	13	0	39	259	0	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	250		0	0		225	50		50	0		0
Storage Lanes	1		0	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850			0.850	
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	1454	3363	0	0	3434	1553	1701	1522	0	1668	1492	0
Flt Permitted	0.200				0.912		0.459			0.729		
Satd. Flow (perm)	306	3363	0	0	3135	1553	822	1522	0	1280	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				41		48			100	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	1%	0%	0%	1%	0%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	43	1517	17	17	1142	41	14	0	43	288	0	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	1534	0	0	1159	41	14	43	0	288	226	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0	21.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0	28.0	8.0	8.0		8.0	8.0	
Total Split (s)	63.0	63.0		63.0	63.0	63.0	27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 69 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1365	15	15	1028	37	13	0	39	259	0	203
Future Volume (veh/h)	39	1365	15	15	1028	37	13	0	39	259	0	203
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1556	1780	1794	1912	1898	1912	1794	1794	1794	1766	1794	1766
Adj Flow Rate, veh/h	43	1517	15	17	1142	41	14	0	21	288	0	197
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	0	0	1	0	0	0	0	2	0	2
Cap, veh/h	257	2173	21	53	2172	1026	244	0	389	402	0	389
Arrive On Green	0.84	0.84	0.83	0.62	0.63	0.63	0.26	0.00	0.24	0.26	0.00	0.24
Sat Flow, veh/h	394	3432	34	20	3430	1620	1138	0	1521	1314	0	1521
Grp Volume(v), veh/h	43	747	785	609	550	41	14	0	21	288	0	197
Grp Sat Flow(s),veh/h/ln	394	1691	1774	1809	1640	1620	1138	0	1521	1314	0	1521
Q Serve(g_s), s	4.6	15.2	15.3	0.0	16.7	0.9	1.0	0.0	1.0	19.1	0.0	10.1
Cycle Q Clear(g_c), s	21.3	15.2	15.3	15.7	16.7	0.9	11.0	0.0	1.0	20.0	0.0	10.1
Prop In Lane	1.00		0.02	0.03		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	1071	1124	1167	1039	1026	244	0	389	402	0	389
V/C Ratio(X)	0.17	0.70	0.70	0.52	0.53	0.04	0.06	0.00	0.05	0.72	0.00	0.51
Avail Cap(c_a), veh/h	257	1071	1124	1167	1039	1026	244	0	389	402	0	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.2	3.8	3.8	8.9	9.1	6.2	33.4	0.0	25.7	32.9	0.0	29.1
Incr Delay (d2), s/veh	1.1	2.9	2.8	1.7	1.9	0.1	0.1	0.0	0.1	6.0	0.0	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	5.5	5.8	9.8	8.9	0.5	0.5	0.0	0.6	10.8	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	9.3	6.7	6.6	10.6	11.0	6.3	33.5	0.0	25.7	38.9	0.0	30.2
LnGrp LOS	A	A	A	B	B	A	C		C	D		C
Approach Vol, veh/h		1575			1200			35			485	
Approach Delay, s/veh		6.7			10.7			28.8			35.3	
Approach LOS		A			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		63.0		27.0		63.0		27.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		56.0		22.0		56.0		22.0				
Max Q Clear Time (g_c+I1), s		23.3		13.0		2.9		22.0				
Green Ext Time (p_c), s		0.4		0.0		0.3		0.0				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			12.6									
HCM 6th LOS			B									

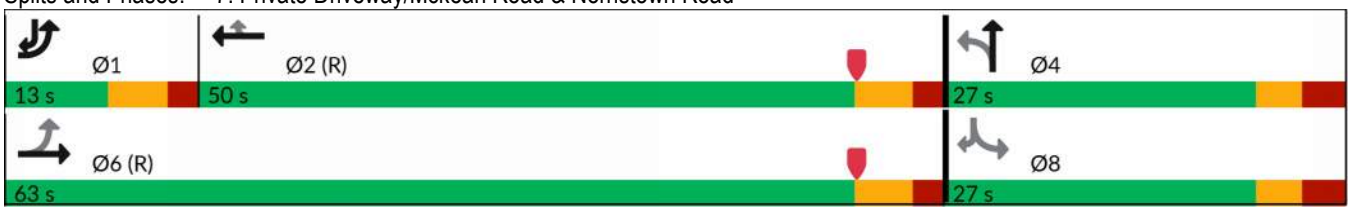
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	1097	0	0	1106	135	0	0	0	268	0	208
Future Volume (vph)	111	1097	0	0	1106	135	0	0	0	268	0	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	350		0	0		230	0		0	70		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1701	3369	0	0	3403	1538	0	1800	0	1620	0	1499
Flt Permitted	0.130									0.757		
Satd. Flow (perm)	233	3369	0	0	3403	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						144						46
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	118	1167	0	0	1177	144	0	0	0	285	0	221
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	1167	0	0	1177	144	0	0	0	285	0	221
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	63.0			50.0	50.0	27.0	27.0		27.0		13.0
Total Split (%)	14.4%	70.0%			55.6%	55.6%	30.0%	30.0%		30.0%		14.4%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)	58.4	58.4			45.6	45.6				21.6		34.4
Actuated g/C Ratio	0.65	0.65			0.51	0.51				0.24		0.38
v/c Ratio	0.42	0.53			0.68	0.16				0.92		0.36
Control Delay (s/veh)	10.8	9.6			17.8	4.5				70.0		17.4
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)	10.8	9.6			17.8	4.5				70.0		17.4
LOS	B	A			B	A				E		B
Approach Delay (s/veh)		9.8			16.4						47.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B						D	
Queue Length 50th (ft)	23	170			215	7				157		68
Queue Length 95th (ft)	43	220			296	32				#307		126
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)	350					230				70		
Base Capacity (vph)	281	2186			1724	850				315		604
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.42	0.53			0.68	0.17				0.90		0.37

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay (s/veh): 18.6 Intersection LOS: B
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



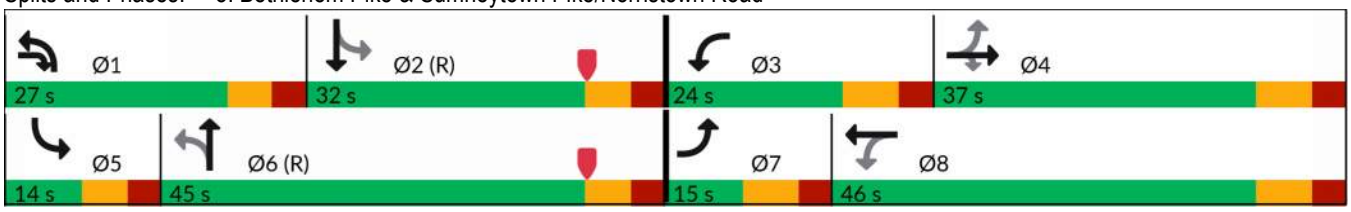
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	814	197	327	854	170	228	485	230	189	427	43
Future Volume (vph)	61	814	197	327	854	170	228	485	230	189	427	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99		0.98	0.99	0.99							
Frt			0.850		0.975			0.952			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	3290	1624	1686	3222	0	1604	3163	0	1604	3135	0
Flt Permitted	0.127			0.104			0.254			0.264		
Satd. Flow (perm)	218	3290	1603	185	3222	0	429	3163	0	446	3135	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			182					70			8	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	0%	2%	1%	1%	1%	1%	0%	1%	0%
Adj. Flow (vph)	64	857	207	344	899	179	240	511	242	199	449	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	857	207	344	1078	0	240	753	0	199	494	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	12.0	13.0	13.0		12.0	22.0		12.0	22.0	
Total Split (s)	15.0	37.0	27.0	24.0	46.0		27.0	45.0		14.0	32.0	
Total Split (%)	12.5%	30.8%	22.5%	20.0%	38.3%		22.5%	37.5%		11.7%	26.7%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	814	197	327	854	170	228	485	230	189	427	43
Future Volume (veh/h)	61	814	197	327	854	170	228	485	230	189	427	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1809	1823	1896	1949	1921	2012	1898	1898	1973	1837	1823	1911
Adj Flow Rate, veh/h	64	857	155	344	899	179	240	511	205	199	449	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	2	1	1	1	1	0	1	0
Cap, veh/h	179	866	598	325	1034	206	435	817	326	287	932	
Arrive On Green	0.05	0.25	0.25	0.14	0.34	0.33	0.12	0.32	0.32	0.07	0.27	0.00
Sat Flow, veh/h	1723	3464	1605	1856	3032	604	1807	2515	1004	1750	3555	0
Grp Volume(v), veh/h	64	857	155	344	541	537	240	366	350	199	449	0
Grp Sat Flow(s),veh/h/ln	1723	1732	1605	1856	1825	1811	1807	1803	1717	1750	1732	0
Q Serve(g_s), s	3.2	29.6	8.0	17.0	33.3	33.4	10.8	20.6	20.8	8.0	13.1	0.0
Cycle Q Clear(g_c), s	3.2	29.6	8.0	17.0	33.3	33.4	10.8	20.6	20.8	8.0	13.1	0.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	179	866	598	325	622	618	435	586	558	287	932	
V/C Ratio(X)	0.36	0.99	0.26	1.06	0.87	0.87	0.55	0.62	0.63	0.69	0.48	
Avail Cap(c_a), veh/h	207	866	598	325	622	618	529	586	558	287	932	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.9	44.8	26.1	36.4	37.0	37.2	25.2	34.3	34.6	34.1	36.8	0.0
Incr Delay (d2), s/veh	1.2	27.9	0.2	58.7	9.6	9.7	1.1	5.0	5.3	7.0	1.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	22.3	5.4	16.8	21.4	21.3	8.1	14.7	14.3	3.6	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.1	72.8	26.4	95.0	46.6	46.9	26.3	39.2	39.9	41.0	38.6	0.0
LnGrp LOS	C	E	C	F	D	D	C	D	D	D	D	
Approach Vol, veh/h		1076			1422			956			648	
Approach Delay, s/veh		63.8			58.4			36.2			39.4	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.7	38.3	24.0	37.0	14.0	45.0	13.1	47.9
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	20.0	25.0	16.0	29.0	7.0	38.0	7.0	38.0
Max Q Clear Time (g_c+I1), s	13.3	15.6	19.5	32.1	10.5	23.1	5.7	35.8
Green Ext Time (p_c), s	0.4	1.3	0.0	0.0	0.0	2.4	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	51.7
HCM 6th LOS	D

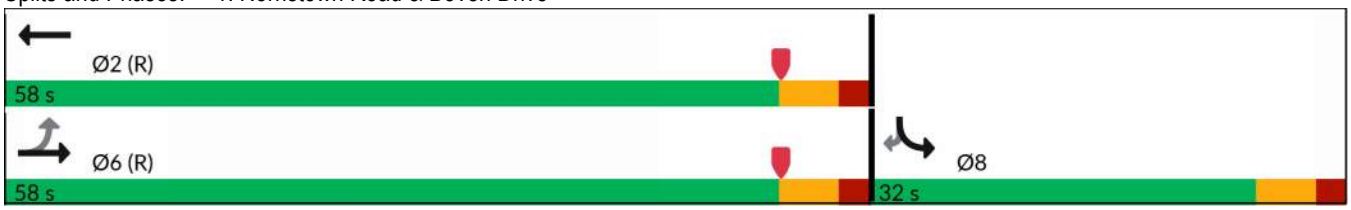
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	568	565	77	79	170
Future Volume (vph)	170	568	565	77	79	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	150			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.982			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3230	0	1906	1705
Flt Permitted	0.395				0.950	
Satd. Flow (perm)	694	3306	3230	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			29			179
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	179	598	595	81	83	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	598	676	0	83	179
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	58.0	58.0	58.0		32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%		35.6%	35.6%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	568	565	77	79	170
Future Volume (veh/h)	170	568	565	77	79	170
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	179	598	595	81	83	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	658	2670	2278	309	282	251
Arrive On Green	0.76	0.76	1.00	1.00	0.13	0.13
Sat Flow, veh/h	765	3628	3105	410	2115	1882
Grp Volume(v), veh/h	179	598	336	340	83	178
Grp Sat Flow(s),veh/h/ln	765	1767	1705	1721	2115	1882
Q Serve(g_s), s	6.7	4.5	0.0	0.0	3.2	8.1
Cycle Q Clear(g_c), s	6.7	4.5	0.0	0.0	3.2	8.1
Prop In Lane	1.00			0.24	1.00	1.00
Lane Grp Cap(c), veh/h	658	2670	1288	1300	282	251
V/C Ratio(X)	0.27	0.22	0.26	0.26	0.29	0.71
Avail Cap(c_a), veh/h	658	2670	1288	1300	635	565
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.2	0.0	0.0	35.2	37.3
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.5	0.6	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	1.8	0.3	0.3	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.5	3.4	0.5	0.5	35.7	41.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		777	676		261	
Approach Delay, s/veh		3.7	0.5		39.3	
Approach LOS		A	A		D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	73.0			73.0	17.0
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	52.0			52.0	26.0
Max Q Clear Time (g_c+I1), s	2.0			6.5	10.1
Green Ext Time (p_c), s	21.9			15.6	0.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	7.9
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	655	2	1	643	1	2
Future Volume (vph)	655	2	1	643	1	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	12	12	12	13	12
Grade (%)	0%			0%	-1%	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.910	
Flt Protected					0.984	
Satd. Flow (prot)	3273	0	0	3420	1674	0
Flt Permitted					0.984	
Satd. Flow (perm)	3273	0	0	3420	1674	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	121			979	230	
Travel Time (s)	1.8			14.8	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	689	2	1	677	1	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	691	0	0	678	3	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	655	2	1	643	1	2
Future Vol, veh/h	655	2	1	643	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-1	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	689	2	1	677	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	691	0	1031	346
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	-	-	3.9	-	7.5	7.1
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.4	-	2.8	2.9
Pot Cap-1 Maneuver	-	-	1032	-	*763	*1051
Stage 1	-	-	-	-	*789	-
Stage 2	-	-	-	-	*994	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1032	-	*761	*1051
Mov Cap-2 Maneuver	-	-	-	-	*761	-
Stage 1	-	-	-	-	*789	-
Stage 2	-	-	-	-	*992	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	933	-	-	1032	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.9	-	-	8.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	567	0	0	674	43	358	0	202	0	0	0
Future Volume (vph)	7	567	0	0	674	43	358	0	202	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	12	12	11	12	12	12	12	12	15	12
Grade (%)		1%			1%			-3%			-4%	
Storage Length (ft)	110		0	115		0	350		140	0		0
Storage Lanes	1		0	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.991				0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1645	3257	0	0	5902	0	1617	1617	1522	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1645	3257	0	0	5902	0	1617	1617	1522	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)					15				210			
Link Speed (mph)		45			45			40			30	
Link Distance (ft)		246			175			383			301	
Travel Time (s)		3.7			2.7			6.5			6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%
Adj. Flow (vph)	7	591	0	0	702	45	373	0	210	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	7	591	0	0	747	0	186	187	210	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Perm			
Protected Phases	7	6 7 8			2		4	4				
Permitted Phases									4			
Detector Phase	7	6 7 8			2		4	4	4			
Switch Phase												
Minimum Initial (s)	3.0				15.0		3.0	3.0	3.0			
Minimum Split (s)	9.0				21.0		9.0	9.0	9.0			
Total Split (s)	13.0				34.0		19.0	19.0	19.0			
Total Split (%)	14.4%				37.8%		21.1%	21.1%	21.1%			
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0			
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0			
Total Lost Time (s)	5.0				5.0		5.0	5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None				C-Max		None	None	None			
Act Effct Green (s)	7.8	65.8			31.1		14.2	14.2	14.2			
Actuated g/C Ratio	0.09	0.73			0.35		0.16	0.16	0.16			
v/c Ratio	0.04	0.24			0.36		0.72	0.73	0.50			
Control Delay (s/veh)	27.2	1.5			21.6		54.5	54.8	9.7			
Queue Delay	0.0	0.1			0.0		0.0	0.0	0.0			
Total Delay (s/veh)	27.2	1.7			21.6		54.5	54.8	9.7			
LOS	C	A			C		D	D	A			
Approach Delay (s/veh)		2.0			21.7			38.5				

Lane Group	Ø3	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	3.0	15.0	14.0
Minimum Split (s)	9.0	21.0	20.0
Total Split (s)	13.0	34.0	24.0
Total Split (%)	14%	38%	27%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	None	C-Max	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

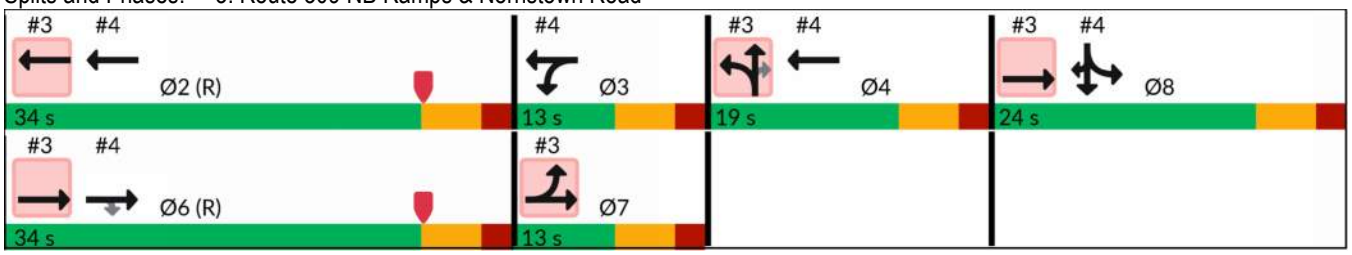
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			C			D				
Queue Length 50th (ft)	4	16			89		107	108	0			
Queue Length 95th (ft)	m13	34			111		#212	#213	60			
Internal Link Dist (ft)		166			95			303			221	
Turn Bay Length (ft)	110						350		140			
Base Capacity (vph)	146	2319			2049		255	255	417			
Starvation Cap Reductn	0	799			0		0	0	0			
Spillback Cap Reductn	0	0			38		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.05	0.39			0.37		0.73	0.73	0.50			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay (s/veh): 20.7 Intersection LOS: C
Intersection Capacity Utilization 72.3% ICU Level of Service C
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Route 309 NB Ramps & Norristown Road



Lane Group	Ø3	Ø6	Ø8
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	507	374	122	964	0	0	0	0	45	0	16
Future Volume (vph)	0	507	374	122	964	0	0	0	0	45	0	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	10	11	11	12	12	12	12	15	12	15
Grade (%)		1%			1%			0%			-4%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	0		1	2		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Flt Permitted				0.950							0.950	
Satd. Flow (perm)	0	4589	1407	3159	3225	0	0	0	0	0	1693	1717
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			402									182
Link Speed (mph)		45			45			30			40	
Link Distance (ft)		118			246			302			432	
Travel Time (s)		1.8			3.7			6.9			7.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	0	545	402	131	1037	0	0	0	0	48	0	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	545	402	131	1037	0	0	0	0	0	48	17
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		6		3	2 3 4					8	8	8
Permitted Phases			6									
Detector Phase		6	6	3	2 3 4					8	8	8
Switch Phase												
Minimum Initial (s)		15.0	15.0	3.0						14.0	14.0	14.0
Minimum Split (s)		21.0	21.0	9.0						20.0	20.0	20.0
Total Split (s)		34.0	34.0	13.0						24.0	24.0	24.0
Total Split (%)		37.8%	37.8%	14.4%						26.7%	26.7%	26.7%
Yellow Time (s)		4.0	4.0	4.0						4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0						2.0	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0							-1.0	-1.0
Total Lost Time (s)		5.0	5.0	5.0							5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		31.1	31.1	7.8	63.1						16.9	16.9
Actuated g/C Ratio		0.35	0.35	0.09	0.70						0.19	0.19
v/c Ratio		0.34	0.53	0.47	0.45						0.15	0.03
Control Delay (s/veh)		21.8	9.4	46.1	3.2						31.0	0.1
Queue Delay		0.0	0.0	0.0	0.5						0.0	0.0
Total Delay (s/veh)		21.8	9.4	46.1	3.8						31.0	0.1
LOS		C	A	D	A						C	A
Approach Delay (s/veh)		16.6			8.6						23.0	

Lane Group	Ø2	Ø4	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	2	4	7
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	3.0	3.0
Minimum Split (s)	21.0	9.0	9.0
Total Split (s)	34.0	19.0	13.0
Total Split (%)	38%	21%	14%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			

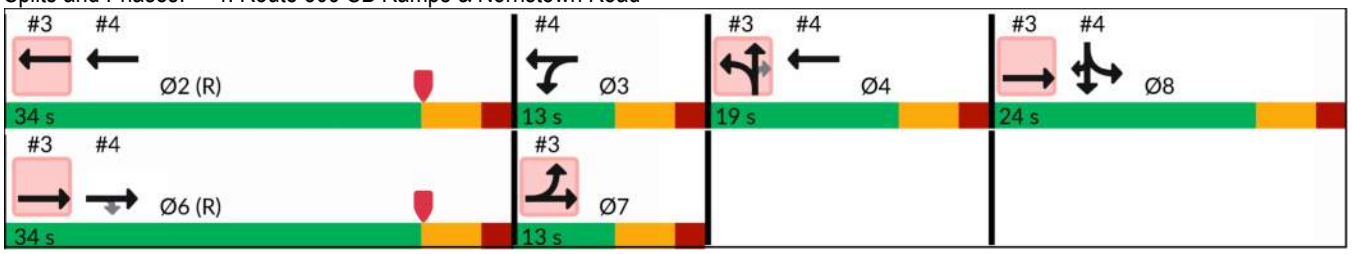
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						C	
Queue Length 50th (ft)		84	26	41	25						23	0
Queue Length 95th (ft)		119	142	m67	45						52	0
Internal Link Dist (ft)		38			166			222			352	
Turn Bay Length (ft)												
Base Capacity (vph)		1585	749	280	2196						357	506
Starvation Cap Reductn		0	0	0	677						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.34	0.54	0.47	0.68						0.13	0.03

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay (s/veh): 12.5 Intersection LOS: B
Intersection Capacity Utilization 72.3% ICU Level of Service C
Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Route 309 SB Ramps & Norristown Road



Lane Group	Ø2	Ø4	Ø7
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

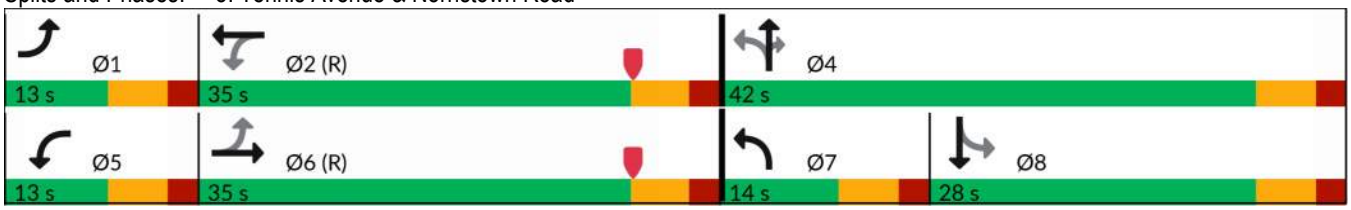
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	453	56	55	424	5	72	84	60	8	84	128
Future Volume (vph)	153	453	56	55	424	5	72	84	60	8	84	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	11	12	12	11	12
Grade (%)		1%			0%			-3%			2%	
Storage Length (ft)	95		0	60		0	0		35	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.983			0.998				0.850		0.921	
Flt Protected	0.950			0.950				0.977			0.998	
Satd. Flow (prot)	1701	3316	0	1710	1796	0	0	1685	1553	0	1568	0
Flt Permitted	0.370			0.453				0.561			0.988	
Satd. Flow (perm)	663	3316	0	815	1796	0	0	968	1553	0	1552	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					1				109		76	
Link Speed (mph)		45			40			40			40	
Link Distance (ft)		979			679			285			344	
Travel Time (s)		14.8			11.6			4.9			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	4%	1%	0%	0%	1%	1%
Adj. Flow (vph)	161	477	59	58	446	5	76	88	63	8	88	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	536	0	58	451	0	0	164	63	0	231	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	1	6		5	2		7	4	4	8	8	
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	23.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	9.0	29.0		9.0	29.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	13.0	35.0		13.0	35.0		14.0	42.0	42.0	28.0	28.0	
Total Split (%)	14.4%	38.9%		14.4%	38.9%		15.6%	46.7%	46.7%	31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	58.9	50.5		53.7	46.0			19.1	19.1		19.1	
Actuated g/C Ratio	0.65	0.56		0.60	0.51			0.21	0.21		0.21	
v/c Ratio	0.29	0.28		0.10	0.49			0.80	0.15		0.59	
Control Delay (s/veh)	3.7	5.0		7.2	18.8			59.4	2.0		26.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay (s/veh)	3.7	5.0		7.2	18.8			59.4	2.0		26.3	
LOS	A	A		A	B			E	A		C	
Approach Delay (s/veh)		4.7			17.5			43.5			26.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	7	34		10	157			89	0		79	
Queue Length 95th (ft)	28	66		29	314			145	9		135	
Internal Link Dist (ft)		899			599			205			264	
Turn Bay Length (ft)	95			60					35			
Base Capacity (vph)	549	1860		574	918			397	702		467	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.29	0.29		0.10	0.49			0.41	0.09		0.49	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 32 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay (s/veh): 16.9 Intersection LOS: B
Intersection Capacity Utilization 71.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Tennis Avenue & Norristown Road

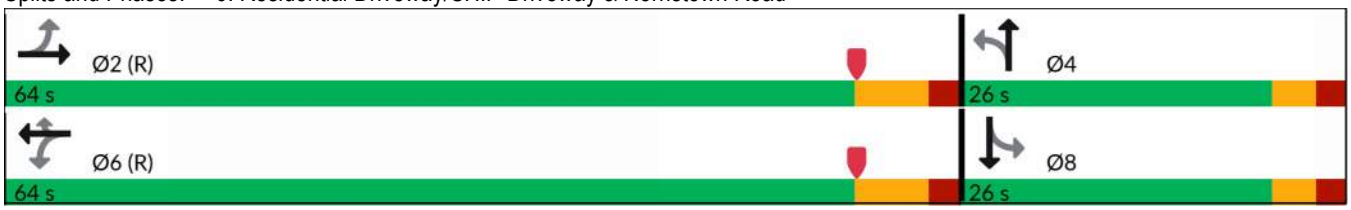


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	855	15	20	855	23	8	0	14	38	0	24
Future Volume (vph)	24	855	15	20	855	23	8	0	14	38	0	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		1%			-3%			1%			1%	
Storage Length (ft)	250		0	0		225	50		50	0		0
Storage Lanes	1		0	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99	0.97						
Frt		0.997				0.850		0.850			0.850	
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	1701	3360	0	0	3434	1553	1701	1522	0	1701	1522	0
Flt Permitted	0.312				0.922		0.741			0.748		
Satd. Flow (perm)	559	3360	0	0	3170	1521	1327	1522	0	1340	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				24		178			177	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		981			1768			250			433	
Travel Time (s)		14.9			26.8			5.7			9.8	
Confl. Peds. (#/hr)				1		1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	891	16	21	891	24	8	0	15	40	0	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	907	0	0	912	24	8	15	0	40	25	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	21.0	21.0		21.0	21.0	21.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0	28.0	8.0	8.0		8.0	8.0	
Total Split (s)	64.0	64.0		64.0	64.0	64.0	26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%	71.1%	28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0	4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 40	

Control Type: Actuated-Coordinated

Splits and Phases: 6: Residential Driveway/SHIP Driveway & Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	855	15	20	855	23	8	0	14	38	0	24
Future Volume (veh/h)	24	855	15	20	855	23	8	0	14	38	0	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1794	1912	1898	1912	1794	1794	1794	1794	1794	1794
Adj Flow Rate, veh/h	25	891	16	21	891	24	8	0	4	40	0	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	531	2824	51	75	2839	1345	136	0	88	155	0	88
Arrive On Green	0.83	0.83	0.82	0.82	0.83	0.83	0.06	0.00	0.05	0.06	0.00	0.05
Sat Flow, veh/h	585	3400	61	40	3417	1619	1330	0	1521	1355	0	1521
Grp Volume(v), veh/h	25	443	464	479	433	24	8	0	4	40	0	25
Grp Sat Flow(s),veh/h/ln	585	1691	1769	1816	1640	1619	1330	0	1521	1355	0	1521
Q Serve(g_s), s	0.9	5.4	5.4	0.0	5.5	0.2	0.5	0.0	0.2	2.6	0.0	1.4
Cycle Q Clear(g_c), s	6.4	5.4	5.4	5.2	5.5	0.2	2.0	0.0	0.2	2.8	0.0	1.4
Prop In Lane	1.00		0.03	0.04		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	531	1405	1470	1531	1363	1345	136	0	88	155	0	88
V/C Ratio(X)	0.05	0.32	0.32	0.31	0.32	0.02	0.06	0.00	0.05	0.26	0.00	0.28
Avail Cap(c_a), veh/h	531	1405	1470	1531	1363	1345	384	0	372	408	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.5	1.7	1.8	1.7	1.7	1.3	41.5	0.0	40.5	41.4	0.0	41.1
Incr Delay (d2), s/veh	0.2	0.6	0.5	0.5	0.6	0.0	0.2	0.0	0.2	0.9	0.0	1.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	1.1	1.2	1.5	1.1	0.0	0.3	0.0	0.2	1.6	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	2.6	2.3	2.3	2.3	2.4	1.3	41.7	0.0	40.7	42.2	0.0	42.8
LnGrp LOS	A	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		932			936			12			65	
Approach Delay, s/veh		2.3			2.3			41.4			42.4	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	80.8	9.2	80.8	9.2
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	57.0	21.0	57.0	21.0
Max Q Clear Time (g_c+I1), s	8.4	4.0	2.2	4.8
Green Ext Time (p_c), s	0.2	0.0	0.2	0.1

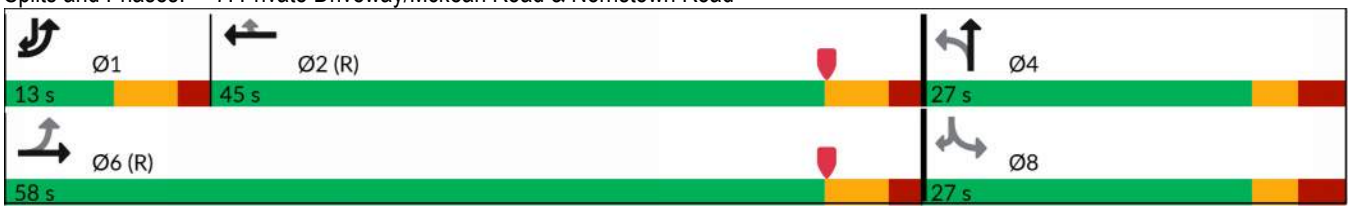
Intersection Summary	
HCM 6th Ctrl Delay, s/veh	3.9
HCM 6th LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	662	0	0	658	86	0	0	0	106	0	115
Future Volume (vph)	106	662	0	0	658	86	0	0	0	106	0	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Grade (%)		1%			-1%			0%			4%	
Storage Length (ft)	350		0	0		230	0		0	70		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1701	3369	0	0	3370	1538	0	1800	0	1620	0	1499
Flt Permitted	0.314									0.757		
Satd. Flow (perm)	562	3369	0	0	3370	1538	0	1800	0	1291	0	1499
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						116						125
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1843			981			161			410	
Travel Time (s)		27.9			14.9			3.7			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	115	720	0	0	715	93	0	0	0	115	0	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	720	0	0	715	93	0	0	0	115	0	125
Turn Type	pm+pt	NA			NA	Perm				Perm		pm+ov
Protected Phases	1	6			2			4				1
Permitted Phases	6					2	4			8		8
Detector Phase	1	6			2	2	4	4		8		1
Switch Phase												
Minimum Initial (s)	5.0	15.0			15.0	15.0	7.0	7.0		7.0		5.0
Minimum Split (s)	11.0	21.0			21.0	21.0	13.0	13.0		13.0		11.0
Total Split (s)	13.0	58.0			45.0	45.0	27.0	27.0		27.0		13.0
Total Split (%)	15.3%	68.2%			52.9%	52.9%	31.8%	31.8%		31.8%		15.3%
Yellow Time (s)	4.0	4.0			4.0	4.0	3.0	3.0		3.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	3.0	3.0		3.0		2.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0		5.0
Lead/Lag	Lead				Lag	Lag						Lead
Lead-Lag Optimize?	Yes				Yes	Yes						Yes
Recall Mode	None	C-Max			C-Max	C-Max	None	None		None		None
Act Effct Green (s)	63.8	64.8			50.5	50.5				13.8		24.5
Actuated g/C Ratio	0.75	0.76			0.59	0.59				0.16		0.29
v/c Ratio	0.21	0.28			0.35	0.09				0.54		0.23
Control Delay (s/veh)	5.2	4.7			11.3	1.9				41.6		4.5
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay (s/veh)	5.2	4.7			11.3	1.9				41.6		4.5
LOS	A	A			B	A				D		A
Approach Delay (s/veh)		4.8			10.3						22.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B						C	
Queue Length 50th (ft)	15	59			102	0				57		0
Queue Length 95th (ft)	38	106			175	17				102		31
Internal Link Dist (ft)		1763			901			81			330	
Turn Bay Length (ft)	350					230				70		
Base Capacity (vph)	539	2568			2000	960				334		528
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.21	0.28			0.36	0.10				0.34		0.24

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 26 (31%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay (s/veh): 9.4	Intersection LOS: A
Intersection Capacity Utilization 43.3%	ICU Level of Service A
Analysis Period (min) 15	

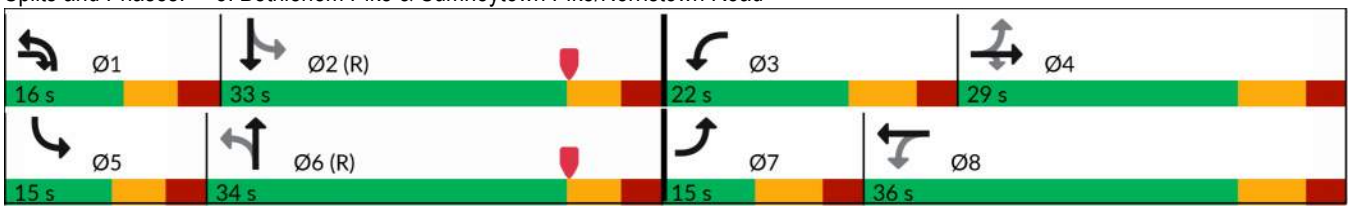
Splits and Phases: 7: Private Driveway/Mckean Road & Norristown Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	457	177	166	465	131	167	440	157	193	437	65
Future Volume (vph)	58	457	177	166	465	131	167	440	157	193	437	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	14	11	11	13	10	11	13	10	10	16
Grade (%)		-1%			-4%			-3%			-1%	
Storage Length (ft)	100		305	600		0	135		0	325		110
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.967			0.961			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1582	3290	1624	1686	3236	0	1558	3201	0	1604	3147	0
Flt Permitted	0.348			0.262			0.336			0.257		
Satd. Flow (perm)	580	3290	1624	465	3236	0	551	3201	0	434	3147	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			171					50			16	
Link Speed (mph)		35			45			40			40	
Link Distance (ft)		475			1843			139			365	
Travel Time (s)		9.3			27.9			2.4			6.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	1%	1%	0%	1%	0%	4%	1%	0%	0%	0%	0%
Adj. Flow (vph)	62	491	190	178	500	141	180	473	169	208	470	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	491	190	178	641	0	180	642	0	208	540	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	1	3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Detector Phase	7	4	1	3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	26.0	13.0	13.0	26.0		13.0	25.0		12.0	25.0	
Total Split (s)	15.0	29.0	16.0	22.0	36.0		16.0	34.0		15.0	33.0	
Total Split (%)	15.0%	29.0%	16.0%	22.0%	36.0%		16.0%	34.0%		15.0%	33.0%	
Yellow Time (s)	5.0	5.0	4.0	5.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	6.0	7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: Bethlehem Pike & Sumneytown Pike/Norristown Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	457	177	166	465	131	167	440	157	193	437	65
Future Volume (veh/h)	58	457	177	166	465	131	167	440	157	193	437	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1766	1823	1896	1949	1935	2027	1855	1898	1988	1837	1837	1911
Adj Flow Rate, veh/h	62	491	149	178	500	137	180	473	155	208	470	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	1	1	0	1	0	4	1	0	0	0	0
Cap, veh/h	222	634	450	322	680	185	471	955	311	401	1221	
Arrive On Green	0.05	0.18	0.18	0.11	0.24	0.23	0.10	0.36	0.35	0.09	0.35	0.00
Sat Flow, veh/h	1682	3464	1607	1856	2855	778	1767	2674	870	1750	3583	0
Grp Volume(v), veh/h	62	491	149	178	321	316	180	318	310	208	470	0
Grp Sat Flow(s),veh/h/ln	1682	1732	1607	1856	1838	1795	1767	1803	1741	1750	1745	0
Q Serve(g_s), s	2.9	13.5	7.4	7.4	16.1	16.3	6.3	13.8	14.0	7.6	10.1	0.0
Cycle Q Clear(g_c), s	2.9	13.5	7.4	7.4	16.1	16.3	6.3	13.8	14.0	7.6	10.1	0.0
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.50	1.00		0.00
Lane Grp Cap(c), veh/h	222	634	450	322	438	428	471	644	622	401	1221	
V/C Ratio(X)	0.28	0.78	0.33	0.55	0.73	0.74	0.38	0.49	0.50	0.52	0.38	
Avail Cap(c_a), veh/h	264	762	510	396	533	520	476	644	622	401	1221	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.8	38.9	28.6	28.1	35.1	35.4	17.7	25.1	25.4	19.0	24.4	0.0
Incr Delay (d2), s/veh	0.7	4.2	0.4	1.4	3.9	4.2	0.5	2.7	2.8	1.2	0.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	10.0	4.9	5.8	11.6	11.6	4.4	10.1	10.0	5.4	7.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.5	43.1	29.0	29.6	39.0	39.6	18.2	27.8	28.2	20.1	25.3	0.0
LnGrp LOS	C	D	C	C	D	D	B	C	C	C	C	
Approach Vol, veh/h		702			815			808			678	
Approach Delay, s/veh		39.0			37.2			25.8			23.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	41.0	18.0	25.3	15.0	41.7	12.5	30.8
Change Period (Y+Rc), s	7.0	7.0	8.0	8.0	7.0	7.0	8.0	8.0
Max Green Setting (Gmax), s	9.0	26.0	14.0	21.0	8.0	27.0	7.0	28.0
Max Q Clear Time (g_c+I1), s	8.8	12.6	9.9	16.0	10.1	16.3	5.4	18.6
Green Ext Time (p_c), s	0.0	1.6	0.2	1.3	0.0	1.8	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	31.5
HCM 6th LOS	C

Notes

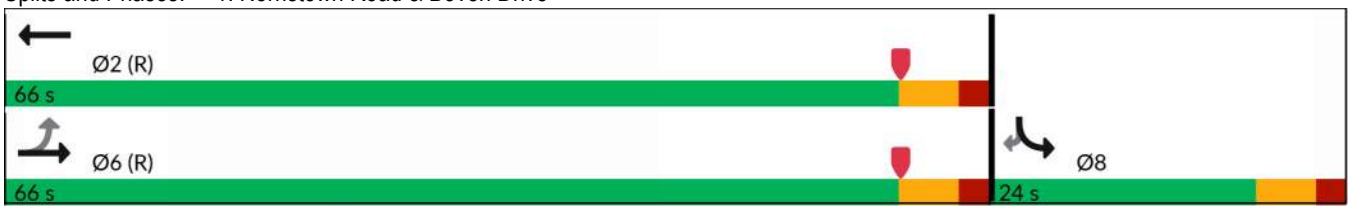
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

2032 Projected Conditions With SHIP Development with Improvements

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	744	802	59	50	111
Future Volume (vph)	147	744	802	59	50	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3211	3169	0	1906	1137
Flt Permitted	0.311				0.950	
Satd. Flow (perm)	547	3211	3169	0	1906	1137
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			116
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	4%	2%	13%	0%	50%
Adj. Flow (vph)	153	775	835	61	52	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	775	896	0	52	116
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	66.0	66.0	66.0		24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%		26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	744	802	59	50	111
Future Volume (veh/h)	147	744	802	59	50	111
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1818	1766	1612	2221	1481
Adj Flow Rate, veh/h	153	775	835	61	52	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	4	2	13	0	50
Cap, veh/h	556	2642	2426	177	262	156
Arrive On Green	0.76	0.76	1.00	1.00	0.12	0.12
Sat Flow, veh/h	623	3544	3259	232	2115	1255
Grp Volume(v), veh/h	153	775	442	454	52	115
Grp Sat Flow(s),veh/h/ln	623	1727	1678	1725	2115	1255
Q Serve(g_s), s	6.9	6.1	0.0	0.0	2.0	8.0
Cycle Q Clear(g_c), s	6.9	6.1	0.0	0.0	2.0	8.0
Prop In Lane	1.00			0.13	1.00	1.00
Lane Grp Cap(c), veh/h	556	2642	1284	1319	262	156
V/C Ratio(X)	0.28	0.29	0.34	0.34	0.20	0.74
Avail Cap(c_a), veh/h	556	2642	1284	1319	447	265
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.3	3.2	0.0	0.0	35.4	38.0
Incr Delay (d2), s/veh	1.2	0.3	0.7	0.7	0.4	6.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	2.3	0.5	0.5	1.9	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.5	3.5	0.7	0.7	35.8	44.7
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		928	896		167	
Approach Delay, s/veh		3.7	0.7		41.9	
Approach LOS		A	A		D	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	73.8				73.8	16.2
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	60.0				60.0	18.0
Max Q Clear Time (g_c+I1), s	2.0				8.1	10.0
Green Ext Time (p_c), s	33.2				24.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.5
HCM 6th LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	151	1187	599	62	94	168
Future Volume (vph)	151	1187	599	62	94	168
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.986			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3274	3186	0	1906	1705
Flt Permitted	0.327				0.950	
Satd. Flow (perm)	575	3274	3186	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20			189
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	191	1503	758	78	119	213
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	1503	836	0	119	213
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	56.0	56.0	56.0		34.0	34.0
Total Split (%)	62.2%	62.2%	62.2%		37.8%	37.8%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	1187	599	62	94	168
Future Volume (veh/h)	151	1187	599	62	94	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1846	1766	1794	2221	2221
Adj Flow Rate, veh/h	191	1503	758	78	119	203
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	0	2	2	0	0	0
Cap, veh/h	567	2595	2273	234	315	280
Arrive On Green	0.74	0.74	1.00	1.00	0.15	0.15
Sat Flow, veh/h	659	3600	3160	316	2115	1882
Grp Volume(v), veh/h	191	1503	414	422	119	203
Grp Sat Flow(s),veh/h/ln	659	1754	1678	1709	2115	1882
Q Serve(g_s), s	9.6	17.6	0.0	0.0	4.6	9.3
Cycle Q Clear(g_c), s	9.6	17.6	0.0	0.0	4.6	9.3
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	567	2595	1242	1265	315	280
V/C Ratio(X)	0.34	0.58	0.33	0.33	0.38	0.72
Avail Cap(c_a), veh/h	567	2595	1242	1265	682	606
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.3	5.3	0.0	0.0	34.5	36.5
Incr Delay (d2), s/veh	1.6	0.9	0.7	0.7	0.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	7.6	0.4	0.4	4.3	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.9	6.3	0.7	0.7	35.3	40.1
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1694	836		322	
Approach Delay, s/veh		6.2	0.7		38.3	
Approach LOS		A	A		D	

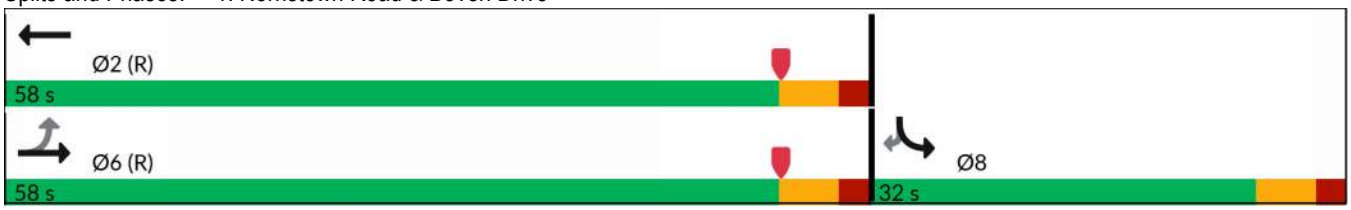
Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	71.6				71.6	18.4
Change Period (Y+Rc), s	6.0				6.0	6.0
Max Green Setting (Gmax), s	50.0				50.0	28.0
Max Q Clear Time (g_c+I1), s	2.0				19.6	11.3
Green Ext Time (p_c), s	27.4				28.5	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	8.2
HCM 6th LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	170	568	565	77	79	170
Future Volume (vph)	170	568	565	77	79	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	14	14
Grade (%)		-2%	1%		-9%	
Storage Length (ft)	250			605	60	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.982			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1670	3306	3230	0	1906	1705
Flt Permitted	0.395				0.950	
Satd. Flow (perm)	694	3306	3230	0	1906	1705
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			29			179
Link Speed (mph)		45	45		25	
Link Distance (ft)		627	121		331	
Travel Time (s)		9.5	1.8		9.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	179	598	595	81	83	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	598	676	0	83	179
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Detector Phase	6	6	2		8	8
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		3.0	3.0
Minimum Split (s)	21.0	21.0	21.0		9.0	9.0
Total Split (s)	58.0	58.0	58.0		32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%		35.6%	35.6%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Norristown Road & Boveri Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	568	565	77	79	170
Future Volume (veh/h)	170	568	565	77	79	170
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1875	1860	1794	1794	2221	2221
Adj Flow Rate, veh/h	179	598	595	81	83	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	658	2670	2278	309	282	251
Arrive On Green	0.76	0.76	1.00	1.00	0.13	0.13
Sat Flow, veh/h	765	3628	3105	410	2115	1882
Grp Volume(v), veh/h	179	598	336	340	83	178
Grp Sat Flow(s),veh/h/ln	765	1767	1705	1721	2115	1882
Q Serve(g_s), s	6.7	4.5	0.0	0.0	3.2	8.1
Cycle Q Clear(g_c), s	6.7	4.5	0.0	0.0	3.2	8.1
Prop In Lane	1.00			0.24	1.00	1.00
Lane Grp Cap(c), veh/h	658	2670	1288	1300	282	251
V/C Ratio(X)	0.27	0.22	0.26	0.26	0.29	0.71
Avail Cap(c_a), veh/h	658	2670	1288	1300	635	565
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.2	0.0	0.0	35.2	37.3
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.5	0.6	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	1.8	0.3	0.3	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.5	3.4	0.5	0.5	35.7	41.0
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		777	676		261	
Approach Delay, s/veh		3.7	0.5		39.3	
Approach LOS		A	A		D	

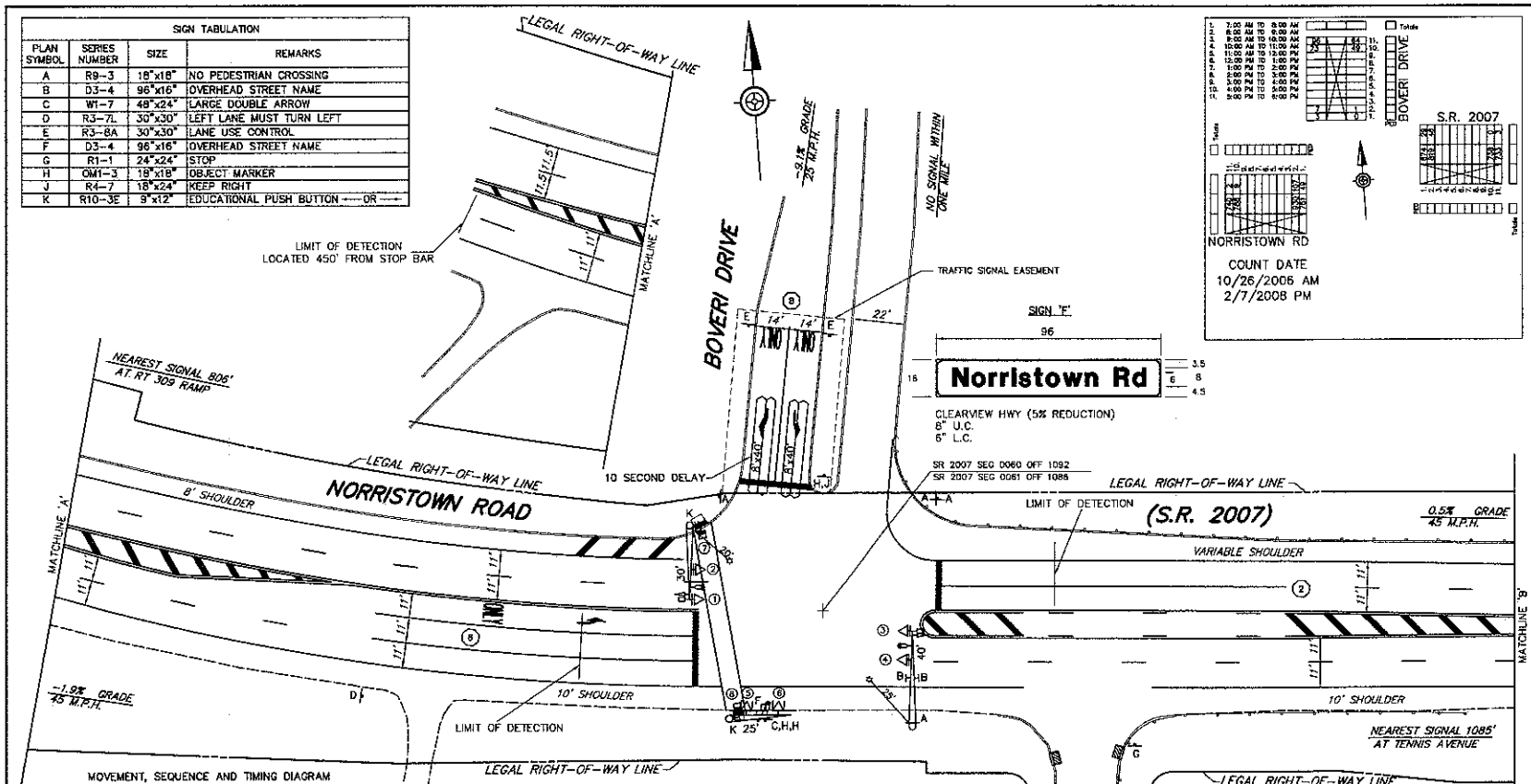
Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	73.0			73.0	17.0
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	52.0			52.0	26.0
Max Q Clear Time (g_c+I1), s	2.0			6.5	10.1
Green Ext Time (p_c), s	21.9			15.6	0.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	7.9
HCM 6th LOS	A

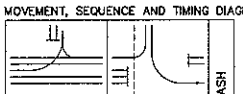
APPENDIX I:

PennDOT Traffic Signal Diagrams

SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R9-3	18"x18"	NO PEDESTRIAN CROSSING
B	D3-4	96"x16"	OVERHEAD STREET NAME
C	W1-7	48"x24"	LARGE DOUBLE ARROW
D	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
E	R3-8A	30"x30"	LANE USE CONTROL
F	D3-4	96"x16"	OVERHEAD STREET NAME
G	R1-1	24"x24"	STOP
H	OM1-3	18"x18"	OBJECT MARKER
J	R4-7	18"x24"	KEEP RIGHT
K	R10-3E	9"x12"	EDUCATIONAL PUSH BUTTON ←OR→



MOVEMENT, SEQUENCE AND TIMING DIAGRAM



PHASE	2+6				B				FLASH
INTERVAL / SIGNALS	1	2	3		4	5	6	7	
1,2	G	Y	R		R	R	R	R	Y
3,4	G	Y	R		R	R	R	R	Y
5,6	R	R	R		G	G	Y	R	R
7,8	H	H	H		M_*	FH_*	H	H	OFF

FIXED		4	2				4	2
MINIMUM	15				3			
SEC./ACT.	**							
MAX. INITIAL	37							
PASSAGE	***				3			
MAXIMUM 1	50				15			
MAXIMUM 2	55				31			
PEDESTRIAN*					7	24		
MEMORY	MN				NL			

* UPON PEDESTRIAN ACTUATION ONLY, OTHERWISE H AT ALL TIMES

SIGN 'B'
96
16 ← Boveri Dr 2 8 10.67 3.33
DOUBLE SIDED
CLEARVIEW HWY (10% REDUCTION)
Type T Arrow
10.6" U.C.
8" L.C.

SIGN 'B'
96
16 Boveri Dr → 2 8 10.67 3.33
DOUBLE SIDED
CLEARVIEW HWY (10% REDUCTION)
10.6" U.C.
8" L.C.
Type T Arrow

OPERATION NOTES:

- SIGNAL TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 8.
- PEDESTRIAN COUNTDOWN TIMER TO COUNTDOWN DURING FLASHING HAND INTERVAL.
- REFER TO SYSTEM PERMIT #I-0118 FOR PROGRAM TIMES AND WEEKLY PROGRAM CHART.

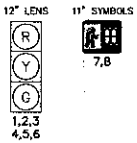
**DENSITY ZONE NOTES:

- RANGE OF DETECTION: 30-50 FEET FROM STOP BAR
- MINIMUM SPEED BOUNDARY: 1 MPH

***ADVANCE DILEMMA ZONE NOTES:

- ESTIMATED TIME OF ARRIVAL: MIN 2.5-MAX 5.5 SEC.
- RANGE OF DETECTION: MIN 50-MAX 450FT.
- MINIMUM SPEED BOUNDARY 35MPH

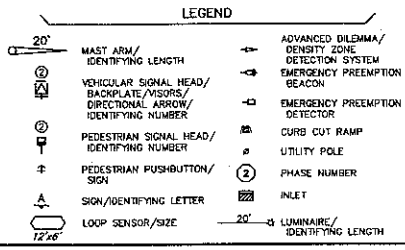
SIGNAL INDICATIONS



SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS 5,6

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & LOUVERS _____

LEGEND



GENERAL NOTES

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SYSTEM PERMIT I-0118

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: LOWER GWYNEDD TOWNSHIP
INTERSECTION: NORRISTOWN ROAD (S.R. 2007) & BOVERI DRIVE

REVIEWED: _____ DATE
MUNICIPAL OFFICIAL _____ DATE

RECOMMENDED: _____ DATE
DISTRICT TRAFFIC ENGINEER _____ DATE

NO.	REVISION	DEV/REVIK	DATE	REVIK	DATE	RECOM.	DATE
1							
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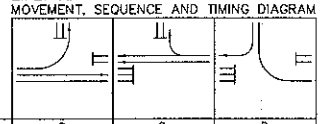
7							
8							

SHEET 2 OF 3 | PERMIT # 64-3676 | FILE # 3676

BRRT 0610 FILE 3676

EMERGENCY PRE-EMPTION PHASING

MOVEMENT, SEQUENCE AND TIMING DIAGRAM



PHASE	6			2			8		
SIGNALS \ INTERVAL	8	9	10	11	12	13	14	15	16
1,2	R	R	R	G	Y ⓐ	R ⓐ	R	R	R
3,4	G	Y ⓐ	R ⓐ	R	R	R	R	R	R
5,6	R	R	R	R	R	R	G	Y	R
7,8	H	H	H	H	H	H	H	H	H
FIXED TIME	*	4	2	*	4	2	*	4	2

* FOR DURATION OF PRE-EMPTION

NOTE: IF PRE-EMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PRE-EMPTION.

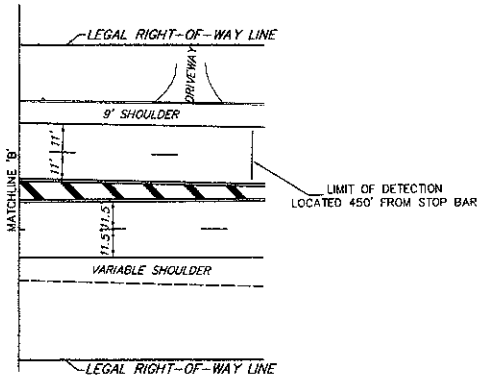
ⓐ SIGNAL TO INDICATE G WHEN RETURNING TO NORMAL OPERATION.

ⓑ SIGNAL TO INDICATE G/⚡ WHEN RETURNING TO NORMAL OPERATION.

EMERGENCY PRE-EMPTION NOTES:

- CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE EASTBOUND & WESTBOUND APPROACHES OF NORRISTOWN ROAD (S.R. 2007), AND THE SOUTHBOUND APPROACH OF BOVERI DRIVE, WITH A FLASHING FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION.

  THIS EMERGENCY BEACON SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT, AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH.
- THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY, FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS ACCORDINGLY, FOLLOWED BY THE GREEN INTERVAL FOR THE PREEMPTED PHASE.
- IF THE SIGNALS ARE IN EITHER YELLOW OR RED CLEARANCE, THE CLEARANCE TIMES SHALL BE COMPLETED BEFORE THE GREEN INTERVAL OF THE PRE-EMPTION PHASE OCCURS.
- IF THE SIGNALS ARE FLASHING WHEN ACTIVATED BY AN EMERGENCY VEHICLE ALL SIGNALS SHALL REMAIN FLASHING.
- UPON COMPLETION OF PRE-EMPTION PHASE 2, 6, OR 8, IN RETURNING TO NORMAL OPERATION PHASE 2+6 INTERVAL 1 SHALL FOLLOW.
- IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.
- IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED, PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVED" OPERATION.
- THE FIELD LOCATIONS OF THE PRE-EMPTION DETECTORS MAY DIFFER FROM THE LOCATIONS DEPICTED ON THE CONDITION DIAGRAM, AS THE DETECTORS MAY NEED TO BE RELOCATED AND/OR ADJUSTED TO PROVIDE ACCEPTABLE OPERATION AS DEEMED APPROPRIATE BY DEPARTMENT PERSONNEL.
- IF THE SIGNAL HAS BEEN ACTUATED BY A PEDESTRIAN PUSH BUTTON, AND THE SIGNAL IS PRE-EMPTED, THE PED "WALK (MAN)" INTERVAL SHALL TERMINATE IMMEDIATELY AND THE PED "CLEAR (FLASHING HAND AND COUNTDOWN TIMER)" INTERVAL SHALL TIME OUT THIS INTERVAL FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES. BEFORE GOING INTO EMERGENCY PRE-EMPTION PHASE.



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PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: NORRISTOWN ROAD (S.R. 2007) & BOVERI DRIVE

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

DATE

DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./REVW.	DATE	REVW.	DATE	REDWN.	DATE
1							
2							
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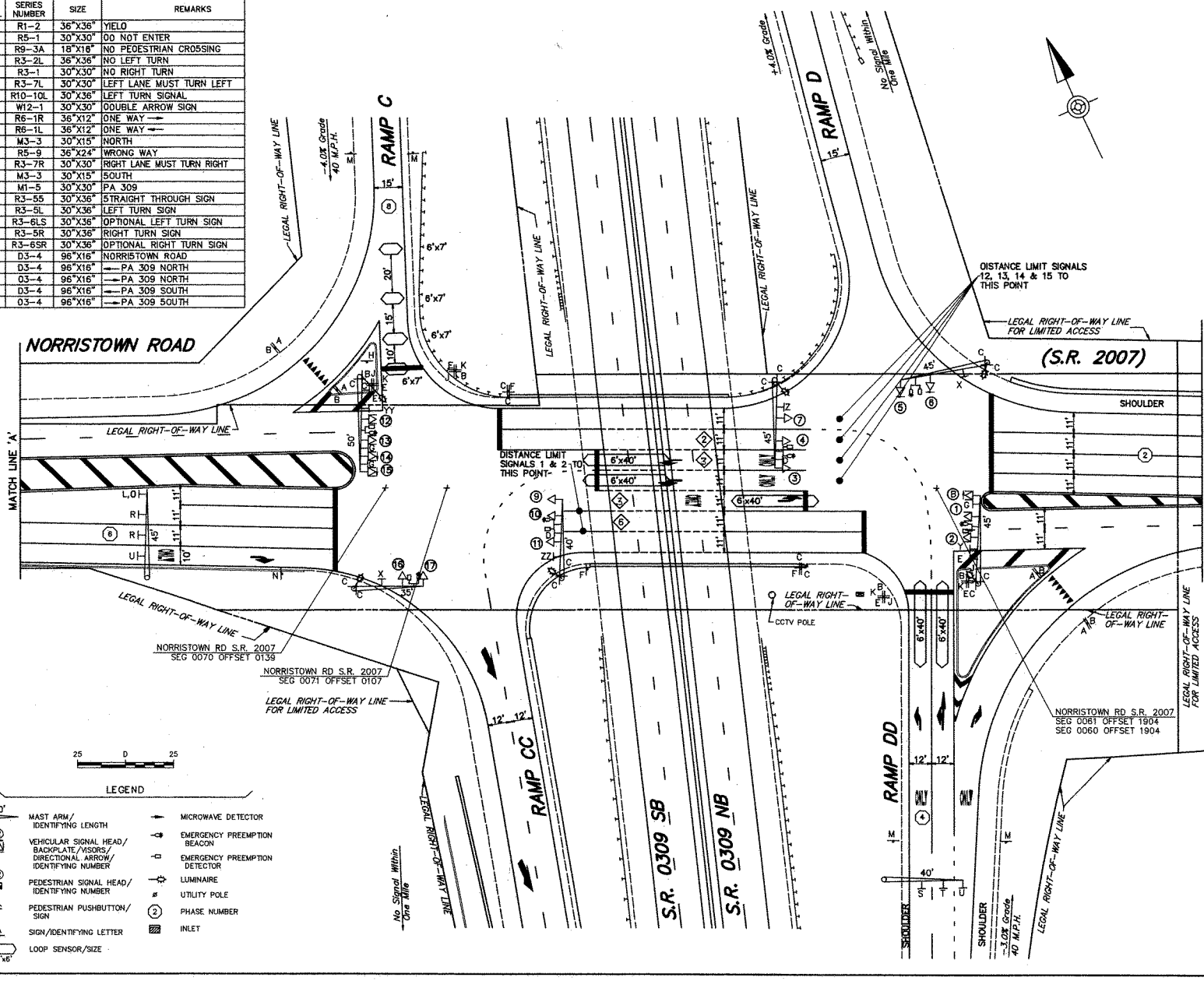
SHEET 3 OF 3 | PERMIT # 64-3676 | FILE # 3676

SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R1-2	36"X36"	YIELD
B	R5-1	30"X30"	DO NOT ENTER
C	R9-3A	18"X18"	NO PEDESTRIAN CROSSING
D	R3-2L	36"X36"	NO LEFT TURN
E	R3-1	30"X30"	NO RIGHT TURN
F	R3-7L	30"X30"	LEFT LANE MUST TURN LEFT
G	R10-10L	30"X36"	LEFT TURN SIGNAL
H	W12-1	30"X30"	DOUBLE ARROW SIGN
J	R6-1R	36"X12"	ONE WAY →
K	R6-1L	36"X12"	ONE WAY ←
L	M3-3	30"X15"	NORTH
M	R5-9	36"X24"	WRONG WAY
N	R3-7R	30"X30"	RIGHT LANE MUST TURN RIGHT
P	M3-3	30"X15"	SOUTH
Q	M1-5	30"X30"	PA 309
R	R3-55	30"X36"	STRAIGHT THROUGH SIGN
S	R3-5L	30"X36"	LEFT TURN SIGN
T	R3-6LS	30"X36"	OPTIONAL LEFT TURN SIGN
U	R3-5R	30"X36"	RIGHT TURN SIGN
V	R3-6SR	30"X36"	OPTIONAL RIGHT TURN SIGN
X	D3-4	96"X16"	NORRISTOWN ROAD
Y	D3-4	96"X16"	← PA 309 NORTH
Z	D3-4	96"X16"	→ PA 309 NORTH
YY	D3-4	96"X16"	← PA 309 SOUTH
ZZ	D3-4	96"X16"	→ PA 309 SOUTH



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SYSTEM PERMIT #-011B

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: LOWER GWYNEDD TOWNSHIP
INTERSECTION: NORRISTOWN ROAD (S.R. 2007) AND S.R. 309 NB OFF-RAMP (RAMP DD/ RAMP D) / S.R. 309 SB OFF-RAMP (RAMP CC/RAMP C)

REVIEWED:

Larry M. Comunale — DATE 10/16/06
MUNICIPAL OFFICIAL — DATE

RECOMMENDED:

Paul Lutz — DATE 11/1/06
Louis R. Belmonte — DATE 11/1/06
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	AS-BUILT	PAI	7/12/12	DLA	7/12	JHB	7/13
2							
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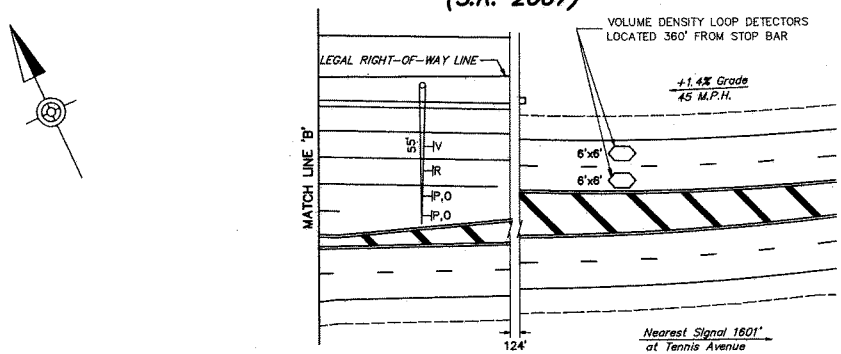
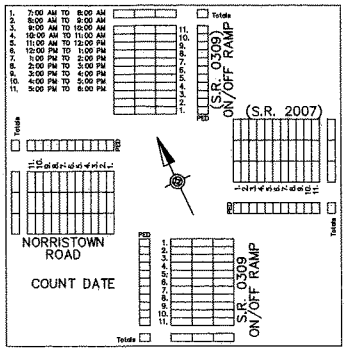
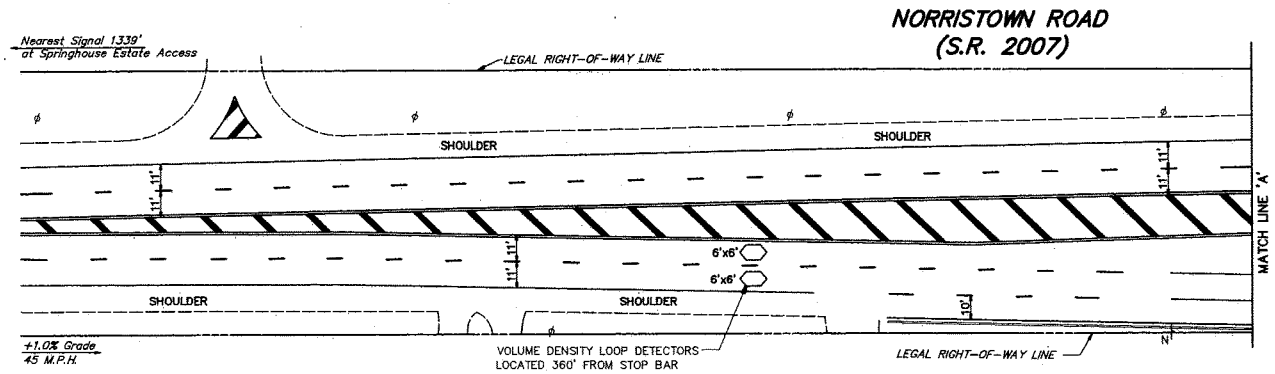
SHEET 2 OF 4 | PERMIT # 64-2151 | FILE # 2151







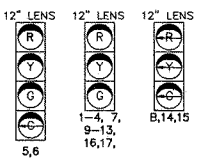
MOVEMENT, SEQUENCE AND TIMING DIAGRAM

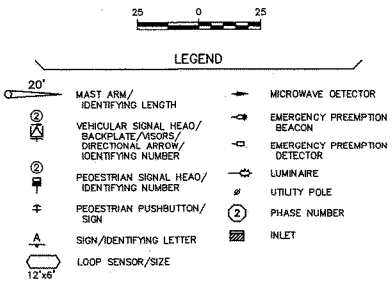
PHASE	2+6			3			4			8			FLASHING
SIGNALS / INTERVAL	1	2	3	4	5	6	7	8	9	10	11	12	
1,2	G	Y⑥	R⑥	G	Y①	R①	R	R	R	G	Y⑤	R⑤	Y
3,4,7	G	Y	R	R	R	R	R	R	R	R	R	R	Y
5,6	R	R	R	R	R	R	G/G	Y	R	R	R	R	R
8	R	R	R	G	Y	R④	R	R	R	G	Y⑩	R⑩	OFF
9,10,11	G	Y	R	R	R	R	R	R	R	R	R	R	Y
12,13	G	Y⑦	R⑦	G	Y③	R③	G	Y⑤	R⑤	R	R	R	Y
14,15	R	R	R	G	Y②	R②	G	Y⑩	R⑩	R	R	R	OFF
16,17	R	R	R	R	R	R	R	R	R	G	Y	R	R
FIXED		4	2		4	2		4	2		4	2	
MINIMUM	15			3			3			3			
SEC/ACT	1.5												
MAX INIT	37												
PASSAGE	5			3			7			5			
TO REDUCE	15												
TBR	37												
MIN GAP	2.5												
MAX 1	45			10			30			10			
MAX 2	50			13			16			36			
PEDESTRIAN													
MEMORY	MN			NL			NL			NL			

OPERATION NOTES:

①G IF FOLLOWED BY PHASE 2+6 OR 8
②~~6~~ IF FOLLOWED BY PHASE 4
③G IF FOLLOWED BY PHASE 4 OR 2+6
④~~6~~ IF FOLLOWED BY PHASE 8
⑤G IF FOLLOWED BY PHASE 2+6
⑥G IF FOLLOWED BY PHASE 1+5 OR 8
⑦G IF FOLLOWED BY PHASE 1+5 OR 4
⑧~~6~~ IF FOLLOWED BY PHASE 1+5

SIGNAL INDICATIONS





SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS _____
SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & PROGRAMMABLE LOUVERS 1, 2, 8, 12, 13, 14, 15
SIGNALS TO BE OPTICALLY PROGRAMMED _____
SIGNALS TO BE LED ALL

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SYSTEM PERMIT #1-011B

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ENGINEERING DISTRICT 6-0

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2							
3							
4							
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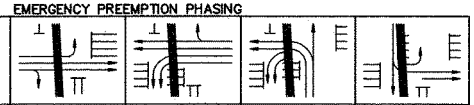
6							
7							
8							

SHEET 3 OF 4 | PERMIT # 64-2151 | FILE # 2151

EMERGENCY PREEMPTION PHASING



PHASE	6			2			4			8		
INTERVAL / SIGNALS	13	14	15	16	17	18	19	20	21	22	23	24
1,2	G	Y①	R①	R	R	R	R	R	R	G	Y①	R①
3,4,7	R	R	R	G	Y①	R①	R	R	R	R	R	R
5,6	R	R	R	R	R	R	G	Y	R	R	R	R
8	~~G~~	~~Y~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~G~~	~~Y~~	~~R~~
9,10,11	G	Y①	R①	R	R	R	R	R	R	R	R	R
12,13	R	R	R	G	Y①	R①	G	Y①	R①	R	R	R
14,15	~~R~~	~~R~~	~~R~~	~~G~~	~~Y~~	~~R~~	~~G~~	~~Y~~	~~R~~	~~R~~	~~R~~	~~R~~
16,17	R	R	R	R	R	R	R	R	R	G	Y	R
FIXED	*	4	2	*	4	2	*	4	2	*	4	2

①SIGNAL TO INDICATE G IN RETURNING TO NORMAL OPERATION

NOTE: IF PRE-EMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PRE-EMPTION.
* FOR DURATION OF PRE-EMPTION

EMERGENCY PRE-EMPTION NOTES

CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE EASTBOUND & WESTBOUND APPROACHES OF NORRISTOWN ROAD, SR 0309 RAMP C SOUTHBOUND, AND SR 0309 RAMP DD NORTHBOUND APPROACH WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION. THIS EMERGENCY BEACON SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY FOLLOWED BY COMPLETE YELLOW AND RED CLEARANCES, ACCORDINGLY. THEN THE GREEN INTERVAL FOR THE PREEMPTED PHASE SHALL FOLLOW.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PRE-EMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.

IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.

IF THE SIGNALS WHEN ACTIVATED BY AN EMERGENCY VEHICLE ARE FLASHING, ALL SIGNALS SHALL REMAIN FLASHING.

UPON COMPLETION OF PRE-EMPTION PHASE 2, 6, 8 OR 4, IN RETURNING TO NORMAL, PHASE 2+6 INTERVAL 1 SHALL FOLLOW.

IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED. PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.

OVERHEAD STREET NAME SIGN DETAILS

ALL SIGN LEGENDS ARE TO USE CLEARVIEW HWY FONT 10.67 INCH UPPER CASE AND 8 INCH LOWER CASE. SIGNS SHALL BE WHITE TEXT ON GREEN BACKGROUND. ALL SIGNS ARE SERIES D3-4.

DETAIL SIGN X — 96" × 16" — Norristown Rd — 23% REDUCTION

DETAIL SIGN Y — 96" × 16" — ← PA 309 North — 25% REDUCTION

DETAIL SIGN Z — 96" × 16" — PA 309 North → — 25% REDUCTION

DETAIL SIGN YY — 96" × 16" — ← PA 309 South — 26% REDUCTION

DETAIL SIGN ZZ — 96" × 16" — PA 309 South → — 26% REDUCTION

GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC-8800 SERIES.

SYSTEM PERMIT #-D11B

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: NORRISTOWN ROAD (S.R. 2007) AND S.R. 309 NB OFF-RAMP (RAMP DD/ RAMP D) / S.R. 309 SB OFF-RAMP (RAMP CC/RAMP C)

REVIEWED:

Larry M. Comunale — DATE 10/16/06
MUNICIPAL OFFICIAL — DATE

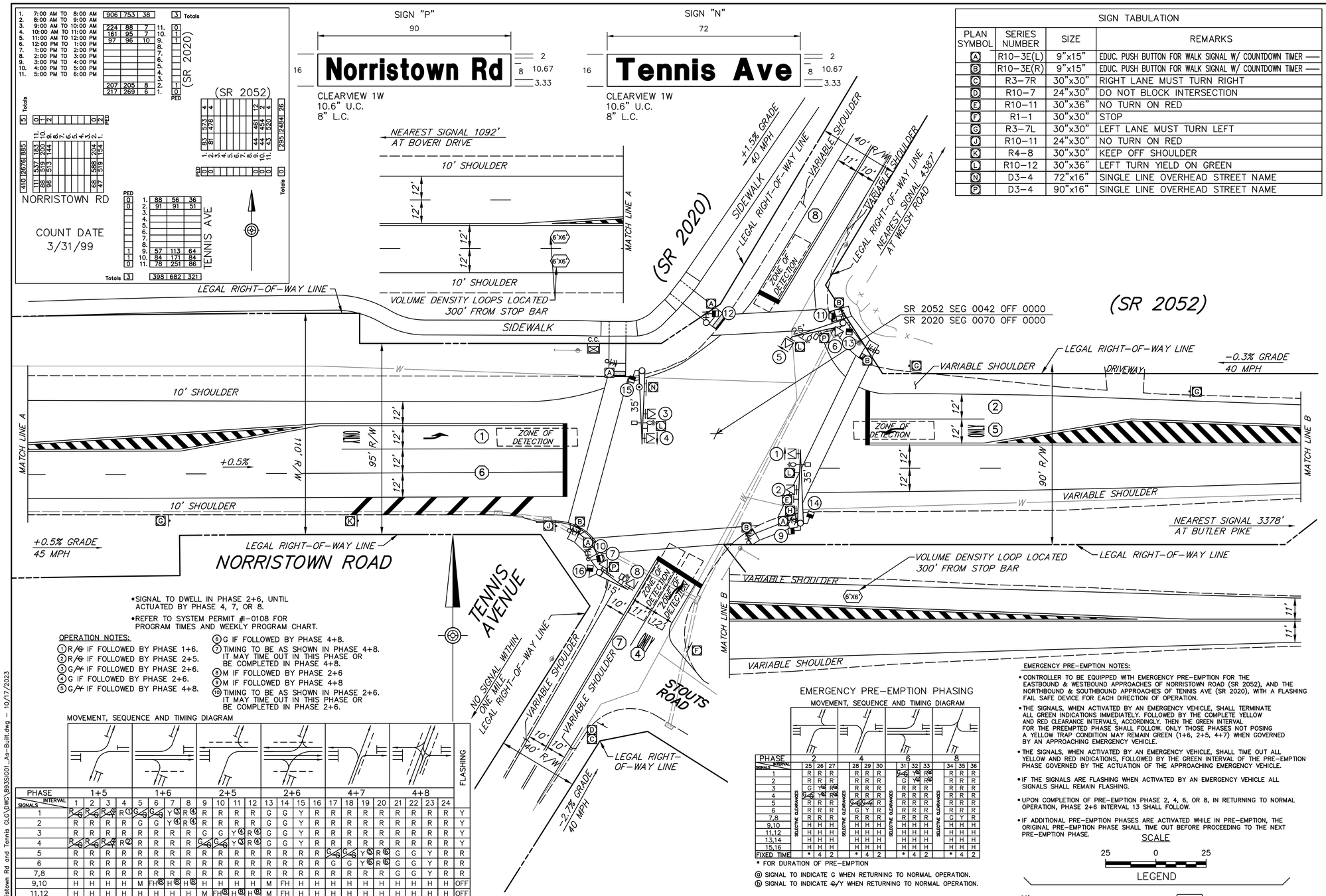
RECOMMENDED:

Paul Lutz — DATE 11/1/06

Louis R. Belmonte — DATE 11/1/06
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	AS-BUILT	PAI	7/12/12	DLA	7/19/12	[illegible]	7/19/12
2							
3							
4							
5							
6							
7							
8							

SHEET 4 OF 4 | PERMIT # 64-2151 | FILE # 2151



SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R10-3E(L)	9"x15"	EDUC. PUSH BUTTON FOR WALK SIGNAL W/ COUNTDOWN TIMER
B	R10-3E(R)	9"x15"	EDUC. PUSH BUTTON FOR WALK SIGNAL W/ COUNTDOWN TIMER
C	R3-7R	30"x30"	RIGHT LANE MUST TURN RIGHT
D	R10-7	24"x30"	DO NOT BLOCK INTERSECTION
E	R10-11	30"x36"	NO TURN ON RED
F	R1-1	30"x30"	STOP
G	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
J	R10-11	24"x30"	NO TURN ON RED
K	R4-8	30"x30"	KEEP OFF SHOULDER
L	R10-12	30"x36"	LEFT TURN YIELD ON GREEN
N	D3-4	72"x16"	SINGLE LINE OVERHEAD STREET NAME
P	D3-4	90"x16"	SINGLE LINE OVERHEAD STREET NAME

GENERAL NOTES

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SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

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THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

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PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC-8800 SERIES.

•SIGNAL TO DWELL IN PHASE 2+6, UNTIL ACTUATED BY PHASE 4, 7, OR 8.

•REFER TO SYSTEM PERMIT #I-0108 FOR PROGRAM TIMES AND WEEKLY PROGRAM CHART.

OPERATION NOTES:

1. R/~~G~~ IF FOLLOWED BY PHASE 1+6.
2. R/~~G~~ IF FOLLOWED BY PHASE 2+5.
3. G/~~A~~ IF FOLLOWED BY PHASE 2+6.
4. G IF FOLLOWED BY PHASE 2+6.
5. G/~~A~~ IF FOLLOWED BY PHASE 4+8.
6. G IF FOLLOWED BY PHASE 4+8.
7. TIMING TO BE AS SHOWN IN PHASE 4+8. IT MAY TIME OUT IN THIS PHASE OR BE COMPLETED IN PHASE 4+8.
8. M IF FOLLOWED BY PHASE 2+6
9. M IF FOLLOWED BY PHASE 4+8
10. TIMING TO BE AS SHOWN IN PHASE 2+6. IT MAY TIME OUT IN THIS PHASE OR BE COMPLETED IN PHASE 2+6.

MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	1+5				1+6				2+5				2+6				4+7				4+8				FLASHING
SIGNALS / INTERVAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	R/~~G~~	R/~~G~~	R/~~G~~	R ①	G/~~A~~	G/~~A~~	Y ④	R ④	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	Y
2	R	R	R	R	G	G	Y ④	R ④	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	Y
3	R	R	R	R	R	R	R	R	G	G	Y ④	R ④	G	G	Y	R	R	R	R	R	R	R	R	R	Y
4	R/~~G~~	R/~~G~~	R/~~G~~	R ②	R	R	R	R	G/~~A~~	G/~~A~~	Y ④	R ④	G	G	Y	R	R	R	R	R	R	R	R	R	Y
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G/~~A~~	G/~~A~~	Y ⑤	R ⑥	G	G	Y	R	R
6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R ⑥	G	G	Y	R	R
7,8	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R	R
9,10	H	H	H	H	M	FH ⑧	H ⑧	H ⑧	H	H	H	H	M	FH	H	H	H	H	H	H	H	H	H	H	OFF
11,12	H	H	H	H	H	H	H	H	M	FH ⑧	H ⑧	H ⑧	M	FH	H	H	H	H	H	H	H	H	H	H	OFF
13,14	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	FH ⑧	H ⑧	H ⑧	M	FH	H	H	OFF
15,16	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	FH	H	H	OFF
FIXED			4	2			4	2			4	2			4	2			4	2			4	2	
MINIMUM	3				3				3				23				3				3				
SEC./ACT.													1.5												
MAX. INITIAL													32												
PASSAGE	3				3				3				4.8				3				3				
TBR													32												
TTR													15												
MIN. GAP													2.7												
MAXIMUM 1	10				10				10				48				7				35				
MAXIMUM 2	10				10				10				53				7				35				
PEDESTRIAN*					⑩				⑩				7	20			⑦				7	24			
MEMORY	NL				NL				NL				MN				NL				NL				

* UPON PEDESTRIAN ACTUATION ONLY, OTHERWISE HAND SYMBOL AT ALL TIMES.

EMERGENCY PRE-EMPTION PHASING

MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	2				4				6				8			
SIGNALS / INTERVAL		25	26	27		28	29	30		31	32	33		34	35	36
1	SELECTIVE CLEARANCES	R	R	R	SELECTIVE CLEARANCES	R	R	R	SELECTIVE CLEARANCES	G/~~A~~	Y/~~A~~	R/~~G~~	SELECTIVE CLEARANCES	R	R	R
2		R	R	R		R	R	R		G	Y/~~A~~	R/~~G~~		R	R	R
3		G	Y/~~A~~	R/~~G~~		R	R	R		R	R	R		R	R	R
4		G/~~A~~	Y/~~A~~	R/~~G~~		R	R	R		R	R	R		R	R	R
5		R	R	R		G/~~A~~	G/~~A~~	R		R	R	R		R	R	R
6		R	R	R		G	Y	R		R	R	R		R	R	R
7,8		R	R	R		R	R	R		R	R	R		G	Y	R
9,10		H	H	H		H	H	H		H	H	H		H	H	H
11,12		H	H	H		H	H	H		H	H	H		H	H	H
13,14		H	H	H		H	H	H		H	H	H		H	H	H
15,16		H	H	H		H	H	H		H	H	H		H	H	H
FIXED TIME		*	4	2		*	4	2		*	4	2		*	4	2

* FOR DURATION OF PRE-EMPTION

ⓒ SIGNAL TO INDICATE G WHEN RETURNING TO NORMAL OPERATION.

ⓓ SIGNAL TO INDICATE ~~G~~/Y WHEN RETURNING TO NORMAL OPERATION.

EMERGENCY PRE-EMPTION NOTES:

- CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE EASTBOUND & WESTBOUND APPROACHES OF NORRISTOWN ROAD (SR 2052), AND THE NORTHBOUND & SOUTHBOUND APPROACHES OF TENNIS AVE (SR 2020), WITH A FLASHING FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION.
- THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY. FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS, ACCORDINGLY. THEN THE GREEN INTERVAL FOR THE PREEMPTED PHASE SHALL FOLLOW. ONLY THOSE PHASES NOT POSING A YELLOW TRAP CONDITION MAY REMAIN GREEN (1+6, 2+5, 4+7) WHEN GOVERNED BY AN APPROACHING EMERGENCY VEHICLE.
- THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PRE-EMPTION PHASE GOVERNED BY THE ACTUATION OF THE APPROACHING EMERGENCY VEHICLE.
- IF THE SIGNALS ARE FLASHING WHEN ACTIVATED BY AN EMERGENCY VEHICLE ALL SIGNALS SHALL REMAIN FLASHING.
- UPON COMPLETION OF PRE-EMPTION PHASE 2, 4, 6, OR 8, IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 13 SHALL FOLLOW.
- IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.

SCALE

25 0 25

LEGEND

20'	MAST ARM/ IDENTIFYING LENGTH	12"x6"	LOOP SENSOR/SIZE
1	VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER		ZONE OF DETECTION
1	PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER		MICROWAVE PRESENCE DETECTOR
	PEDESTRIAN PUSHBUTTON/ SIGN		EMERGENCY PRE-EMPTION FLASHING BEACON
A	SIGN/IDENTIFYING LETTER		EMERGENCY PRE-EMPTION DEVICE
	VIDEO DETECTOR	C.R.	CURB RAMP
	OMNI DIRECTIONAL VIDEO DETECTOR		UTILITY POLE
C.C.	CONTROLLER CABINET	1	PHASE NUMBER
			INLET
			DILEMMA ZONE DETECTOR

SIGNAL INDICATIONS

11" SYMBOLS — 9,10,11,12 / 13,14,15,16

12" LENS — R, Y, G — 1,4,5

12" LENS — R, Y, G — 2,3,6 / 7,8

- SIGNAL TO BE EQUIPPED WITH TOUCHLESS ACCESSIBLE PEDESTRIAN SIGNALS (APS) WITH THE FOLLOWING FEATURES:
  - ADA COMPLIANT PUSH BUTTON WITH LATCHING LED INDICATOR AND TONE.
  - A TACTILE DIRECTIONAL ARROW ALIGNED PARALLEL TO THE CROSSING AND WHICH VIBRATES DURING THE WALK INDICATION.
  - A PUSH BUTTON LOCATOR TONE. THE LOCATOR TONE SHALL HAVE A DURATION OF 0.15 SECONDS AND REPEAT AT 1 SECOND INTERVALS, SHALL BE INTENSITY RESPONSIVE TO AMBIENT SOUND, AND AUDIBLE FROM 6 TO 12 FEET FROM THE PUSH BUTTON.
  - ACTUATION OF THE PEDESTRIAN PUSH BUTTON SHALL BE ACCOMPANIED BY THE SPEECH MESSAGE "WAIT" WHEN THE WALK INTERVAL IS NOT TIMING.
  - AN AUDIBLE WALK INDICATION. THE WALK INDICATION SHALL BE AN AUDIBLE PERCUSSIVE TONE. THE AUDIBLE TONE SHALL CONSIST OF 8 TO 10 RAPID TICKS PER SECOND.

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS 1,2,3,4,5,7,8

SYSTEM PERMIT# I-0108

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TWP/UPPER DUBLIN TWP

INTERSECTION: NORRISTOWN ROAD (SR 2052) AND TENNIS AVENUE (SR 2020)

REVIEWED:

MIMI GLEASON — DATE 3/27/2023
MUNICIPAL OFFICIAL — DATE

RECOMMENDED:

JOSEPH BARZOWSKI — 7/15/77

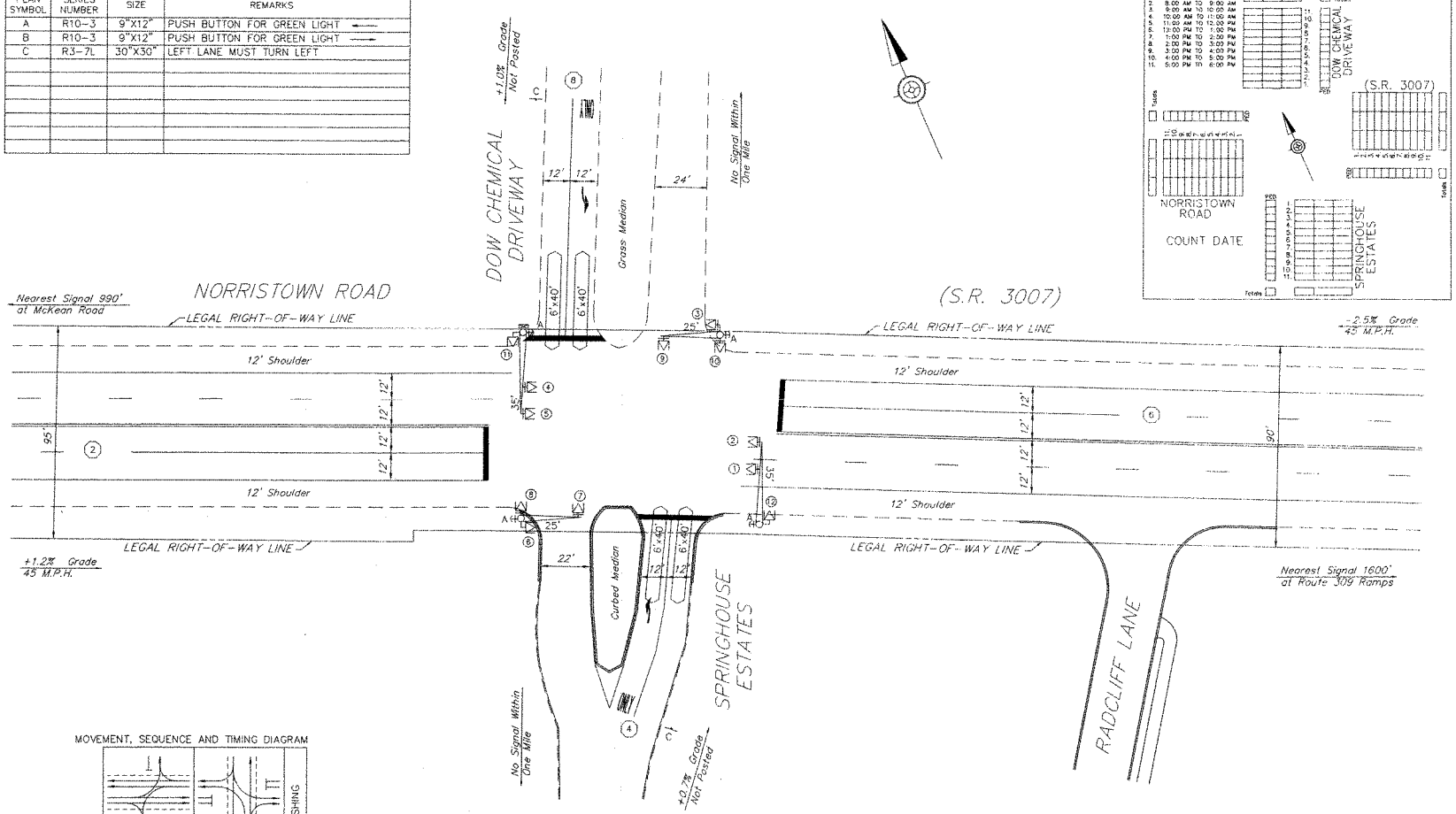
ED WOODS, JR. — 7/15/77
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	RESTRIPED NORRISTOWN RD, ADDED LEFT TURN ADVANCE, PRE-EMPTION, STREET NAME SIGNS	PAI	5/6/99	MLK	6/7/99	DWM	6/8/99
2	UPDATED NEAREST SIGNAL TO BOVERI DRIVE	PAI	6/14/09	DLA	6/14/09	ABP	6/14/09
3	ADD RAMPS UNDER ST-83, RELOC. PED BTTNS, REVISE PED TIME, AS-BUILT	MCM	4/10/18	KPL	4/11/18	DLA	4/25/18
4	ADDED APS PUSH BUTTONS, COUNTDOWN TIMERS AND CONTROLLER ASSEMBLY WITH BATTERY BACKUP	MCM	1/30/23	MJS	5/01/23	KPL	5/01/23
5	AS-BUILT	MCM	10/10/23				
6							
7							
8							

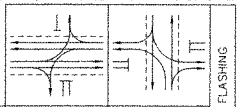
SHEET 2 OF 2 | PERMIT # 64-2031 | FILE # 2031

Q:\PA-PHIL-MC\MCM\eng\LOWERGWY\822893-Norristown Rd and Tennis GLO\DWG\893SIG01_As-Built.dwg - 10/17/2023

SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R10-3	9"X12"	PUSH BUTTON FOR GREEN LIGHT ←
B	R10-3	9"X12"	PUSH BUTTON FOR GREEN LIGHT →
C	R3-7L	30"X30"	LEFT LANE MUST TURN LEFT



MOVEMENT, SEQUENCE AND TIMING DIAGRAM



PHASE	2+6				4+8			
INTERVAL / SIGNALS	1	2	3		4	5	6	
1,2,3	G	Y	R		R	R	R	Y
4,5,6	G	Y	R		R	R	R	Y
7,8	R	R	R		G	Y	R	R
9,10	R	R	R		G	Y	R	R
11,12	R	R	R		G	Y	R	R

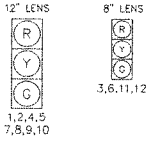
FIXED		5	2			3	2	
MINIMUM	21				3			
PASSAGE					3			
MAXIMUM 1	30				24			
MAXIMUM 2								
PEDESTRIAN*					24			
MEMORY	MX				NL			

* UPON PEDESTRIAN ACTUATION ONLY

OPERATION NOTES:

- REFER TO SYSTEM PERMIT # 1-0118 FOR PROGRAM TIMES AND WEEKLY PROGRAM CHART.
- SIGNAL SHALL FLASH BETWEEN 10 PM AND 6 AM.
- SIGNAL TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 4+8.

SIGNAL INDICATIONS



SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS 1,2,3,4,5,6,7,8,9,10,11,12

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & LOUVERS _____

LEGEND

- 20' MAST ARM/ IDENTIFYING LENGTH
- VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER
- PEDESTRIAN PUSHBUTTON/ SIGN
- A SIGN/IDENTIFYING LETTER
- 12'x6' LOOP SENSOR/SIZE
- EMERGENCY PREEMPTION BEACON
- EMERGENCY PREEMPTION DETECTOR
- CURB CUT RAMP
- UTILITY POLE
- PHASE NUMBER
- INLET

GENERAL NOTES

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ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

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SYSTEM PERMIT #1-0118

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: NORRISTOWN ROAD (S.R. 3007) & SPRINGHOUSE ESTATES/DOW CHEMICAL DRIVEWAY

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

DATE

Stephen B. Lester 5/13/77
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	PROVIDED FOR SIGNAL INTERCONNECTION ON NORRISTOWN ROAD	PWH	7/27/81	JG	7/27/81	SL	7/27/81
2	ADDED PED. BUTTONS, SIGNAL HEADS #11 AND #12, SIGNS A AND B					WJE	8/16/87
3	NEW DRAWING, INTERCONNECT	PAI	7/19/11	[illegible]	[illegible]	[illegible]	8/15/11
4							
5							
6							
7							
8							

SHEET 2 OF 2 | PERMIT # 64-1679 | FILE # 1679

TIME OF DAY SYSTEM CYCLE/SPLIT/OFFSET

PROGRAM 1 = AM PEAK	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2	OFFSET #
INTERSECTIONS		1	2	3	4	5	6	7	8				
1 NORRISTOWN ROAD & TENNIS AVENUE	2031	13 (LEAD)	35		42	13 (LEAD)	35	13 (LEAD)	29	90	40		
2 NORRISTOWN ROAD & BOVERI DRIVE	3676		68				68		22	90	40		
3 NORRISTOWN ROAD & S.R. 0309 RAMPS	2151		22	13	28(SPLIT)		22		27(SPLIT)	90	0		
4 NORRISTOWN ROAD & SPRING HOUSE ESTATES/ROHM & HAAS	1679		65		25		65		25	90	70		
5 NORRISTOWN ROAD & McKEAN ROAD	3282	13 (LEAD)	53				68		24	90	55		

PROGRAM 2 = PM PEAK	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2	OFFSET #
INTERSECTIONS		1	2	3	4	5	6	7	8				
1 NORRISTOWN ROAD & TENNIS AVENUE	2031	13 (LEAD)	35		42	13 (LEAD)	35	13 (LEAD)	29	90	32		
2 NORRISTOWN ROAD & BOVERI DRIVE	3676		57				57		33	90	33		
3 NORRISTOWN ROAD & S.R. 0309 RAMPS	2151		34	13	23(SPLIT)		34		20(SPLIT)	90	0		
4 NORRISTOWN ROAD & SPRING HOUSE ESTATES/ROHM & HAAS	1679		65		25		65		25	90	69		
5 NORRISTOWN ROAD & McKEAN ROAD	3282	13 (LEAD)	53				66		24	90	80		

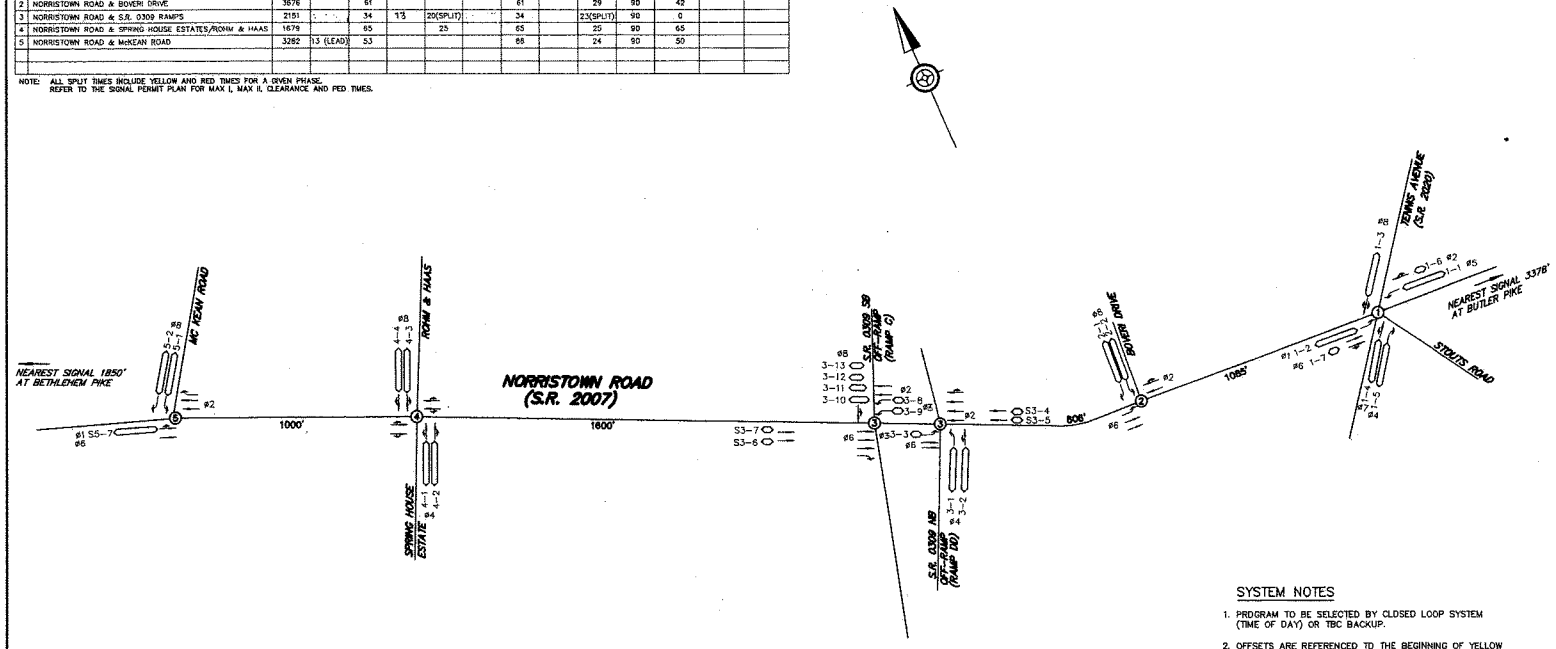
PROGRAM 3 = OFF PEAK (MIDDAY)	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2	OFFSET #
INTERSECTIONS		1	2	3	4	5	6	7	8				
1 NORRISTOWN ROAD & TENNIS AVENUE	2031	13 (LEAD)	35		42	13 (LEAD)	35	13 (LEAD)	29	90	32		
2 NORRISTOWN ROAD & BOVERI DRIVE	3676		61				61		29	90	42		
3 NORRISTOWN ROAD & S.R. 0309 RAMPS	2151		34	13	20(SPLIT)		34		23(SPLIT)	90	0		
4 NORRISTOWN ROAD & SPRING HOUSE ESTATES/ROHM & HAAS	1679		65		25		65		25	90	65		
5 NORRISTOWN ROAD & McKEAN ROAD	3282	13 (LEAD)	53				66		24	90	50		

NOTE: ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.
REFER TO THE SIGNAL PERMIT PLAN FOR MAX I, MAX II, CLEARANCE AND PED TIMES.

WEEKLY PROGRAM CHART

EVENT	DAY	TIME	PROGRAM	REMARKS
1	1–7	0000	FREE	NIGHT TIME
2	1–5	0600	1	AM PEAK
3	1–5	0900	3	OFF PEAK
4	1–5	1500	2	PM PEAK
5	1–5	1900	3	OFF PEAK
6	1–7	2000	FREE	NIGHT TIME
7	6,7	1000	3	OFF PEAK

DAY 1 = MONDAY



SYSTEM NOTES

1. PROGRAM TO BE SELECTED BY CLOSED LOOP SYSTEM (TIME OF DAY) OR TBC BACKUP.
2. OFFSETS ARE REFERENCED TO THE BEGINNING OF YELLOW (PHASE 2+6)
3. SYSTEM: NORRISTOWN ROAD (S.R. 2007) 5 INTERSECTIONS:
   SYSTEM LIMITS: MC KEAN ROAD TO TENNIS AVENUE
   ON STREET MASTER: NORRISTOWN ROAD (S.R. 2007) AND S.R. 309 NB OFF-RAMP (RAMP DD/RAMP D) AND S.R. 309 SB OFF-RAMP (RAMP CC/RAMP C)
4. PRIMARY COORDINATION: FIBER OPTIC CABLE.
   SECONDARY COORDINATION: TBC (DEFAULT TO BACKUP TBC).
5. ACTUAL GREEN TIME TO BE DETERMINED BY CYCLE LENGTH.
6. PHONE DROP LOCATED AT MASTER CONTROLLER FOR TOWNSHIP AND PENNDOT COMMUNICATIONS.

NOT TO SCALE

LEGEND

- (2) INTERSECTION NUMBER
- #6 PHASE NUMBER
- 2-1 VEHICLE DETECTOR/ INTERSECTION – LOOP NUMBER
- S2-1 SYSTEM VEHICLE DETECTOR/ INTERSECTION – LOOP NUMBER

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REFER TO TRAFFIC SIGNAL PERMIT DRAWING FOR INDIVIDUAL INTERSECTION OPERATION, GEOMETRY, PHASING AND CRITICAL TIMES.

FOR CONSTRUCTION AND INSPECTION THE SYSTEM PERMIT SHOULD ALWAYS BE ACCOMPANIED WITH TRAFFIC SIGNAL PERMIT DRAWING.

TEST THE SYSTEM AT LOCAL INTERSECTION LEVEL, SUBSYSTEM LEVEL MASTER CONTROLLER LEVEL AND PERSONAL COMPUTER REMOTE DIAL UP LEVEL.

GATHER THE SYSTEM FAILURE CRITICAL ALARMS REPORT AND ARCHIVE THEM WHERE APPLICABLE.

SET UP PENNDOT DISTRICT 6-0 COMPUTER WITH THE SYSTEM DATABASE AND GRAPHICS. MODIFY THE DATABASE AND GRAPHICS FOR SYSTEMS REVISIONS.

ASSIGN LOOP DETECTORS AND PROGRAM THE CONTROLLERS TO GATHER TRAFFIC VOLUMES IN 15 MINUTE INTERVAL, WHERE APPLICABLE.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

OBTAIN POLE ATTACHMENT PERMIT FOR AERIAL FIBER OPTIC INSTALLATION.

MAINTAIN MASTER CONTROLLER COMMUNICATION SUCH AS PHONE DROPS.

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PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: LOWER GWYNEDD TOWNSHIP
INTERSECTION: NORRISTOWN ROAD CORRIDOR

REVIEWED:

DATE

Larry M. Cornundle — 10/13/06
MUNICIPAL OFFICIAL — DATE

RECOMMENDED:

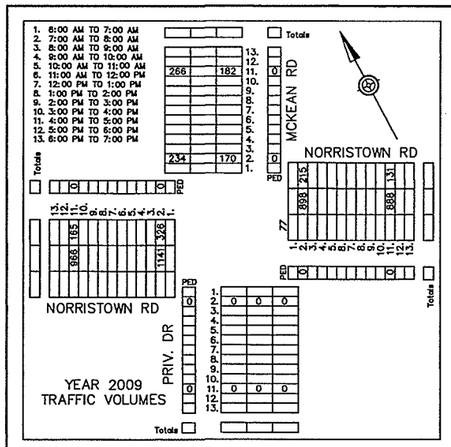
Paul Lutz — 11/1/06
DATE

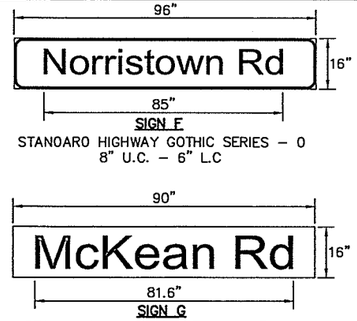
L. R. Belmonte — 11/1/06
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	Revised for McKean HDP	PAI	7/31/09	DLA	8/19/09	ABP	9/21/09
2	Added Boveri Drive	PAI	8/14/09	DLA	8/31/09	ABP	10/14/09
3	Norristown Rd/309 Ramp As-Built	PAI	7/12/12	DLA	[illegible]	[illegible]	1/1/13
4							
5							
6							
7							
8							

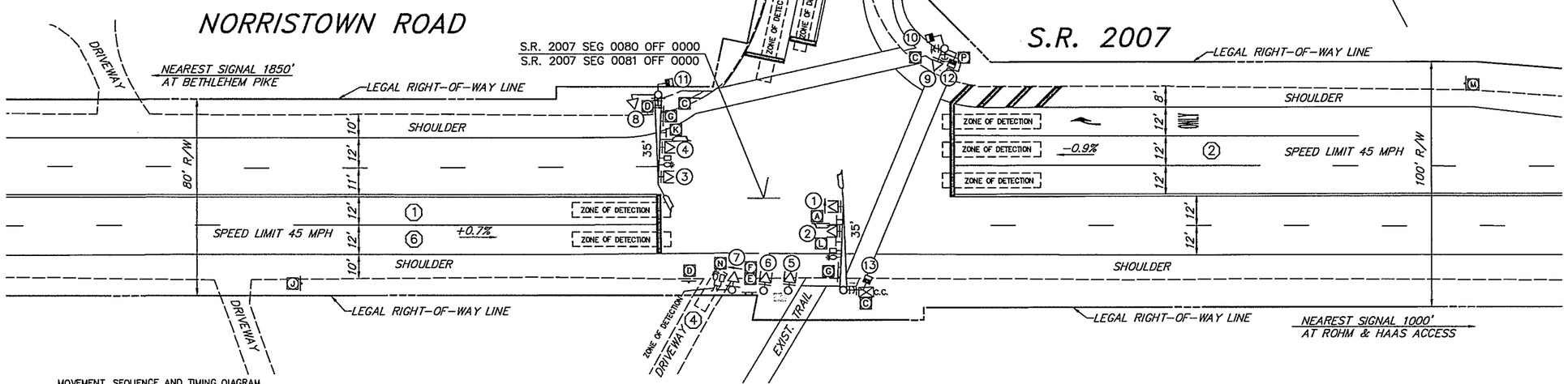
SYSTEM PERMIT # I-0118

MCMN 0701.04.26 SYSTEM PLAN





SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R10–12	30"x36"	LEFT TURN YIELD ON GREEN
B	R3–8A(L–R)	30"x30"	LANE USE CONTROL
C	R10–3E	9"x15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIMER
D	R9–3	18"x18"	NO PEDESTRIAN CROSSING
E	W1–7	48"x24"	LARGE DOUBLE ARROW
F	D3–4	96"x16"	Norristown Rd
G	D3–4	90"x16"	McKean Rd
J	R3–8A(LS–S)	30"x30"	LANE USE CONTROL
K	R3–2	36"x36"	NO LEFT TURN
L	R3–1	36"x36"	NO RIGHT TURN
M	R3–7R	30"x30"	RIGHT LANE MUST TURN RIGHT
N	R10–10R	30"x36"	RIGHT TURN SIGNAL
P	R10–3E	9"x15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIMER



MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	1+6			2+6				4+8				FLASH
INTERVAL / SIGNALS	1	2	3	4	5	6	7	8	9	10	11	
1	G/Y	Y	R	G	G	Y	R	R	R	R	R	Y
2	G	Y	R	G	G	Y	R	R	R	R	R	Y
3,4	R	R	R	G	G	Y	R	R	R	R	R	Y
5,6	R	R	R	R	R	R	R	G	G	Y	R	R
7	R/G	R/Y	R	R	R	R	R	G	G	Y	R	DFF
8,9	R	R	R	R	R	R	R	G	G	Y	R	R
10,11	H	H	H	M	FH	H	H	H	H	H	H	OFF
12,13	H	H	H	H	H	H	H	M	FH	H	H	OFF

FIXED		4	2			4	2			3	3
MINIMUM	5				15				7		
PASSAGE	≠				≠				≠		
MAX. 1	16				40				19		
MAX. 2	7				47				19		
PEDESTRIAN*					7	24			7	26	
MEMORY	NL				SVR				NL		

*UPON PEDESTRIAN ACTUATION ONLY OTHERWISE HAND SYMBOL AT ALL TIMES

OPERATIONAL NOTES:

① G/→Y IF FOLLOWED BY PHASE 2+6
② G IF FOLLOWED BY PHASE 2+6

≠ PHASE PASSAGE CALCULATED BY TRAFFIC ADAPTIVE PROCESSOR

- SIGNAL TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 4+8.
- PHASE SEQUENCE TO BE SELECTED BY TRAFFIC ADAPTIVE PROCESSOR
- TRAFFIC ADAPTIVE SYSTEM TO OPERATE WITH PEDESTRIAN MODULE
- PHASE 1+6 SHALL NOT FOLLOW PHASE 2+6

REFER TO SYSTEM PERMIT #I-0108 FOR TRAFFIC ADAPTIVE OPERATION

EMERGENCY PRE-EMPTION PHASING

PHASE	6				2				8			
INTERVAL / SIGNALS	12	13	14		15	16	17		18	19	20	
1	G/Y	Y	R		R	R	R		R	R	R	
2	G	Y	R		R	R	R		R	R	R	
3,4	R	R	R		G	Y	R		R	R	R	
5,6	R	R	R		R	R	R		G	Y	R	
7	R	R	R		R	R	R		G	Y	R	
8,9	R	R	R		R	R	R		R	R	R	
10,11	H	H	H		H	H	H		H	H	H	
12,13	H	H	H		H	H	H		H	H	H	
FIXED TIME	**	4	2		**	4	2		**	3	3	

** FOR DURATION OF PREEMPTION

Ⓖ SIGNALS TO INDICATE G/→Y WHEN RETURNING TO NORMAL OPERATION

Ⓡ SIGNALS TO INDICATE G WHEN RETURNING TO NORMAL OPERATION

NOTE

IF PRE-EMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION, IT IS RECOMMENDED TO HAVE THE ZERO "DD" FEATURE ON, TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PREEMPTION.

EMERGENCY PREEMPTION NOTES

CONTROLLER TO BE EQUIPPED WITH EMERGENCY PREEMPTION FOR THE EASTBOUND AND WESTBOUND APPROACHES OF NORRISTOWN RD AND THE SOUTHBOUND APPROACH OF MCKEAN RD WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION.

THIS EMERGENCY BEACON SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT, AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH.

LOCATION OF EMERGENCY VEHICLE DETECTORS ARE TO BE FIELD ADJUSTED TO ACHIEVE MAXIMUM OPERATION.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY, FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS, ACCORDINGLY. THEN THE GREEN INTERVAL FOR THE PRE-EMPTED PHASE SHALL FOLLOW. ONLY THOSE PHASES NOT POSING A YELLOW TRAP CONDITION MAY REMAIN GREEN (1+6 OR 6) WHEN GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PREEMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.

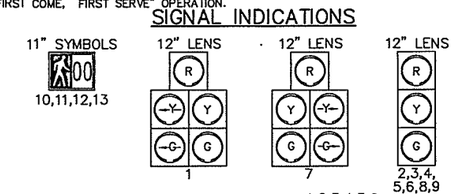
IF THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ARE FLASHING, ALL SIGNALS SHALL REMAIN FLASHING.

IF ADDITIONAL PREEMPTION PHASES ARE ACTIVATED WHILE IN PREEMPTION, THE ORIGINAL PREEMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PREEMPTION PHASE.

UPON COMPLETION OF PREEMPTION PHASE 2, 6 OR 8, IN RETURNING TO NORMAL OPERATION, PHASE 2+6, INTERVAL 4 SHALL FOLLOW.

IN EMERGENCY PREEMPTION, NO PRIORITY SHALL BE ESTABLISHED, PREEMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.

SIGNAL INDICATIONS



SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS 1,2,3,4,5,6

SCALE

25 0 25

LEGEND

- MAST ARM/ IDENTIFYING LENGTH
- VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER
- PEDESTRIAN PUSHBUTTON/ SIGN
- SIGN/IDENTIFYING LETTER
- VIDEO DETECTOR
- C.C. CONTROLLER CABINET
- LOOP SENSOR/SIZE
- ZONE OF DETECTION
- MICROWAVE PRESENCE DETECTOR
- EMERGENCY PRE-EMPTION FLASHING BEACON
- EMERGENCY PRE-EMPTION DEVICE
- CURB RAMP
- UTILITY POLE
- PHASE NUMBER
- INLET
- WAVETRONIX RADAR DETECTOR

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SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

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SYSTEM PERMIT# I-0108

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: NORRISTOWN ROAD (S.R. 2007) AND MCKEAN ROAD

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

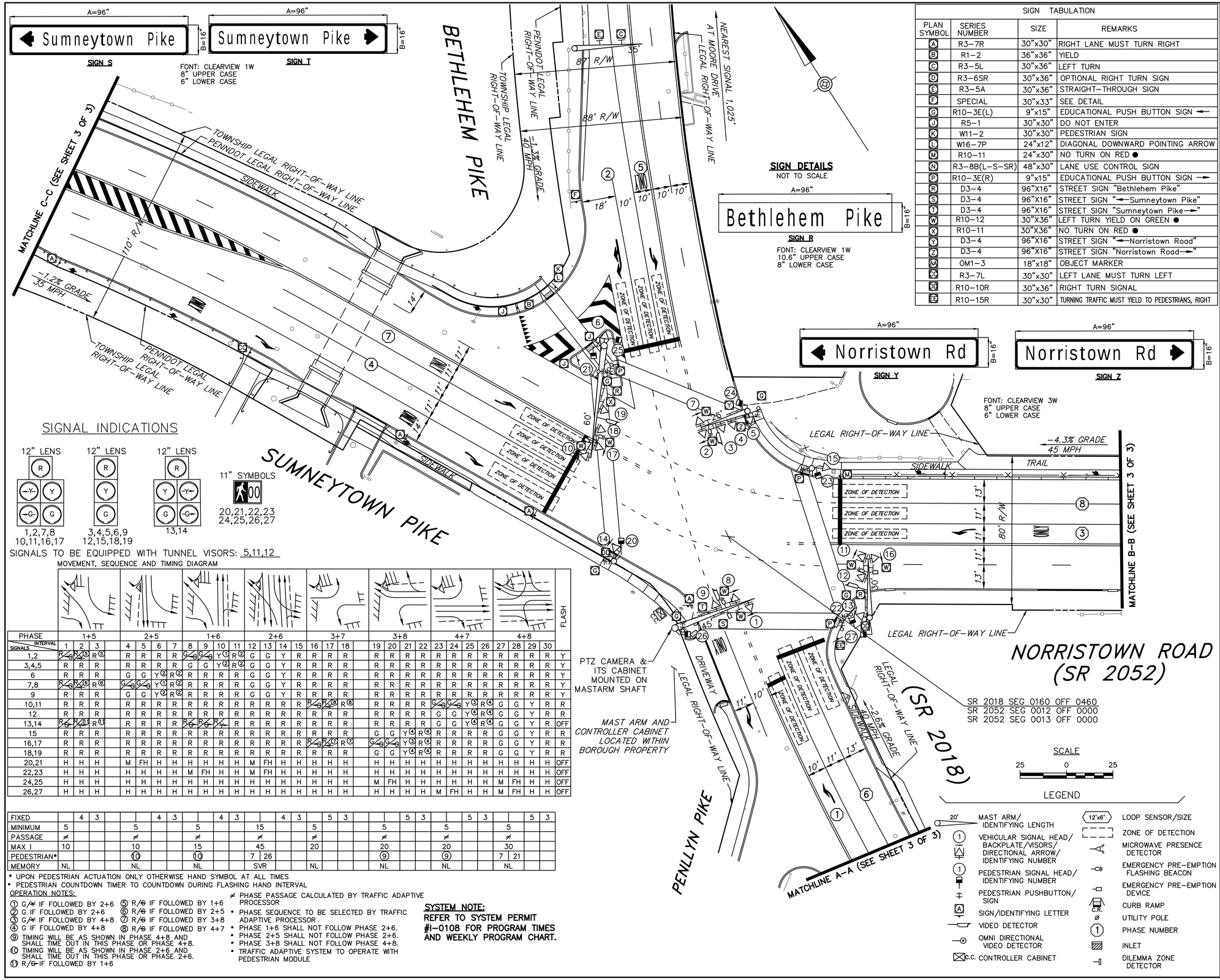
RECOMMENDED:

MARK L. KRAY 4/12/2001

LOUIS R BELMONTE 4/16/2001
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	ADD STROBE LTS. NOR. RD SIGS.	JPS	1/17/02	MLK	1/17/02	LRB	1/24/02
2	REV PLAN, ADDED WB RTL, PED HDS.	ORA	8/7/09	DLA	8/8/09	ABP	8/15/09
3	ADD TRAFFIC ADAPTIVE	MCM		KPL	11/31/18	DLA	7/2/19
4	ARLE AS-BUILT PLAN	MCM		KPL	11/31/18	DLA	7/2/19
5							
6							
7							
8							

SHEET 2 OF 2 PERMIT # 64-3282 FILE # 3282



SIGN TABULATION

PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R3-7R	30"x30"	RIGHT LANE MUST TURN RIGHT
B	R1-2	36"x36"	YIELD
C	R3-5L	30"x36"	LEFT TURN
D	R3-6SR	30"x36"	OPTIONAL RIGHT TURN SIGN
E	R3-5A	30"x36"	STRAIGHT-THROUGH SIGN
F	SPECIAL	30"x33"	SEE DETAIL
G	R10-3E(L)	9"x15"	EDUCATIONAL PUSH BUTTON SIGN ←
J	R5-1	30"x30"	DO NOT ENTER
K	W11-2	30"x30"	PEDESTRIAN SIGN
L	W16-7P	24"x12"	DIAGONAL DOWNWARD POINTING ARROW
M	R10-11	24"x30"	NO TURN ON RED ●
N	R3-8B(L-S-SR)	48"x30"	LANE USE CONTROL SIGN
P	R10-3E(R)	9"x15"	EDUCATIONAL PUSH BUTTON SIGN →
R	D3-4	96"X16"	STREET SIGN "Bethlehem Pike"
S	D3-4	96"X16"	STREET SIGN "←Sumneytown Pike"
T	D3-4	96"X16"	STREET SIGN "Sumneytown Pike→"
W	R10-12	30"X36"	LEFT TURN YIELD ON GREEN ●
X	R10-11	30"X36"	NO TURN ON RED ●
Y	D3-4	96"X16"	STREET SIGN "←Norristown Road"
Z	D3-4	96"X16"	STREET SIGN "Norristown Road→"
AA	OM1-3	18"x18"	OBJECT MARKER
CC	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
DD	R10-10R	30"x36"	RIGHT TURN SIGNAL
EE	R10-15R	30"x30"	TURNING TRAFFIC MUST YIELD TO PEDESTRIANS, RIGHT

SIGNAL INDICATIONS

12" LENS: 1,2,7,8 / 10,11,16,17 — 12" LENS: 3,4,5,6,9 / 12,15,18,19 — 12" LENS: 13,14

11" SYMBOLS: 20,21,22,23 / 24,25,26,27

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS: 5,11,12

MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	1+5			2+5			1+6			2+6			3+7			3+8			4+7			4+8			FLASH
INTERVAL / SIGNALS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1,2	R/G	R/G	R⑥	R	R	R	R	G/G	G/G	Y①	R②	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
3,4,5	R	R	R	R	R	R	R	G	G	Y②	R②	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
6	R	R	R	G	G	Y②	R②	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
7,8	R/G	R/G	R⑥	G/G	G/G	Y①	R②	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
9	R	R	R	G	G	Y②	R②	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
10,11	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R/G	R/G	R⑧	R	R	R	R	G/G	G/G	Y③	R④	G	G	Y	R	R
12	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y④	R④	G	G	Y	R	R
13,14	R/G	R/G	R⑪	R	R	R	R	G/G	R/G	R/G	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y④	R④	G	G	Y	R	OFF
15	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y④	R④	R	R	R	R	G	G	Y	R	R
16,17	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R/G	R/G	R⑦	G/G	G/G	Y③	R④	R	R	R	R	G	G	Y	R	R
18,19	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y④	R④	R	R	R	R	G	G	Y	R	R
20,21	H	H	H	M	FH	H	H	H	H	H	H	M	FH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	OFF
22,23	H	H	H	H	H	H	H	M	FH	H	H	M	FH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	OFF
24,25	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	FH	H	H	H	H	H	H	M	FH	H	H	OFF
26,27	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	FH	H	H	M	FH	H	H	OFF

FIXED		4	3			4	3			4	3			4	3		5	3			5	3			5	3			5	3	
MINIMUM	5				5				5				15				5				5				5				5		
PASSAGE	≠				≠				≠				≠				≠				≠				≠				≠		
MAX I	10				10				15				45				20				20				20				30		
PEDESTRIAN*					⑩				⑩				7 26								⑨				⑨				7 21		
MEMORY	NL				NL				NL				SVR				NL				NL				NL				NL		

* UPON PEDESTRIAN ACTUATION ONLY OTHERWISE HAND SYMBOL AT ALL TIMES
• PEDESTRIAN COUNTDOWN TIMER TO COUNTDOWN DURING FLASHING HAND INTERVAL

OPERATION NOTES:

① G/A IF FOLLOWED BY 2+6
② G IF FOLLOWED BY 2+6
③ G/A IF FOLLOWED BY 4+8
④ G IF FOLLOWED BY 4+8
⑤ R/G IF FOLLOWED BY 1+6
⑥ R/G IF FOLLOWED BY 2+5
⑦ R/G IF FOLLOWED BY 3+8
⑧ R/G IF FOLLOWED BY 4+7
⑨ TIMING WILL BE AS SHOWN IN PHASE 4+8 AND SHALL TIME OUT IN THIS PHASE OR PHASE 4+8.
⑩ TIMING WILL BE AS SHOWN IN PHASE 2+6 AND SHALL TIME OUT IN THIS PHASE OR PHASE 2+6.
⑪ R/G IF FOLLOWED BY 1+6

≠ PHASE PASSAGE CALCULATED BY TRAFFIC ADAPTIVE PROCESSOR
• PHASE SEQUENCE TO BE SELECTED BY TRAFFIC ADAPTIVE PROCESSOR
• PHASE 1+6 SHALL NOT FOLLOW PHASE 2+6.
• PHASE 2+5 SHALL NOT FOLLOW PHASE 2+6.
• PHASE 3+8 SHALL NOT FOLLOW PHASE 4+8.
• TRAFFIC ADAPTIVE SYSTEM TO OPERATE WITH PEDESTRIAN MODULE

SYSTEM NOTE:
REFER TO SYSTEM PERMIT #I-0108 FOR PROGRAM TIMES AND WEEKLY PROGRAM CHART.

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SYSTEM PERMIT# I-0108

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: LOWER GWYNEDD
INTERSECTION: BETHLEHEM PIKE (SR 2018)
SUMNEYTOWN PIKE/NORRISTOWN ROAD (SR 2052)

REVIEWED:

MIMI GLEASON — 1/17/23
MUNICIPAL OFFICIAL — DATE

RECOMMENDED:

PAUL M. LUTZ — 5/24/98

DOUGLAS W. MAY — 6/4/98
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
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5	CHANGE NB SR 2018 TO 2 THROUGH LANES, UPGRADE PED FACILITIES; NEW OSN'S	TPD		DLA	08/18/16	ABP	08/18/16
6	ADD DOUBLE RIGHT TURN LANE TO SB SR 2018, REVISE LANE WID'THS,REVISE PVMT MARKINGS AND SIGNAGE	KPL	5/16/17	DLA	6/2/17	ABP	6/2/17
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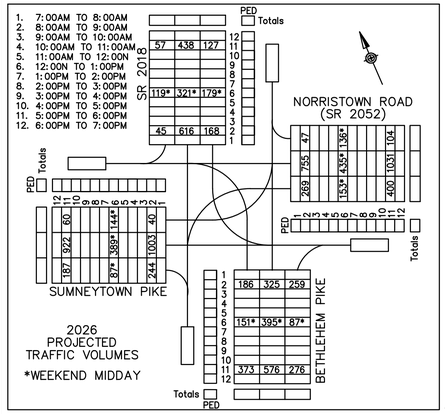
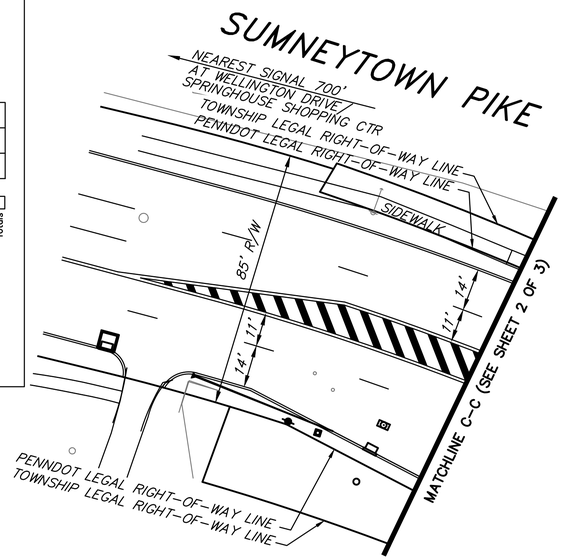
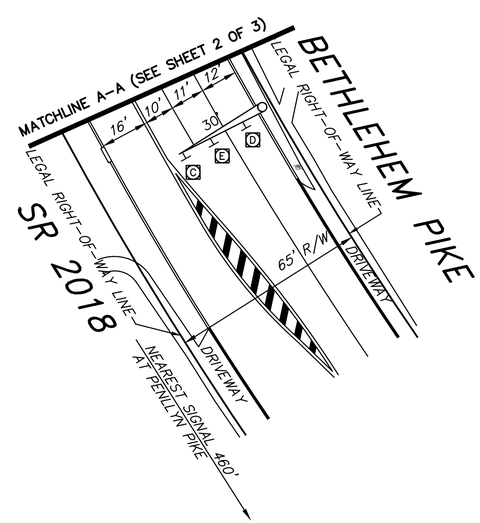
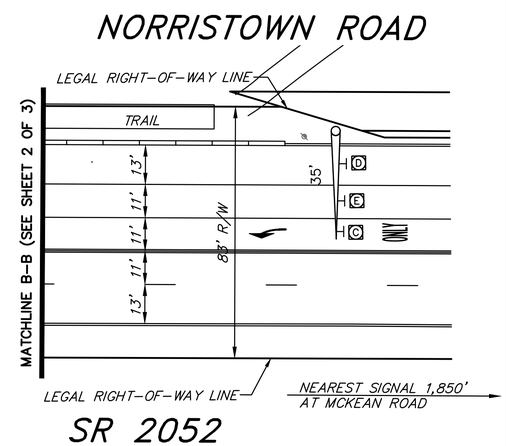
9	WIDEN AND RESTRIPE SUMNEYTOWN PK/ NORRISTOWN RD. REPLACE IMPACTED SIGNAL POLES	MCM	10/27/22	KPL	3/8/23	ABP	3/16/23
10	AS-BUILT	BWMN	9/27/24				

SHEET 2 OF 3 | PERMIT # 64-1048 | FILE # 1048

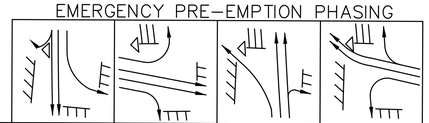








EMERGENCY PRE-EMPTION PHASING



PHASE	2			4			6			8		
INTERVAL / SIGNALS	31	32	33	34	35	36	37	38	39	40	41	42
1,2	R	R	R	R	R	R	G/~~G~~	Y ⓐ	R ⓑ	R	R	R
3,4,5	R	R	R	R	R	R	G	Y ⓐ	R ⓑ	R	R	R
6	G	Y ⓐ	R ⓑ	R	R	R	R	R	R	R	R	R
7,8	G/~~G~~	Y ⓐ	R ⓑ	R	R	R	R	R	R	R	R	R
9	G	Y ⓐ	R ⓑ	R	R	R	R	R	R	R	R	R
10,11	R	R	R	G/~~G~~	Y	R	R	R	R	R	R	R
12	R	R	R	G	Y	R	R	R	R	R	R	R
13,14	R	R	R	G	Y	R	R	R	R	R	R	R
15	R	R	R	R	R	R	R	R	R	G	Y	R
16,17	R	R	R	R	R	R	R	R	R	G/~~G~~	Y	R
18,19	R	R	R	R	R	R	R	R	R	G	Y	R
20,21	H	H	H	H	H	H	H	H	H	H	H	H
22,23	H	H	H	H	H	H	H	H	H	H	H	H
24,25	H	H	H	H	H	H	H	H	H	H	H	H
26,27	H	H	H	H	H	H	H	H	H	H	H	H
FIXED	*	4	3	*	5	3	*	4	3	*	5	3

* FOR DURATION OF PRE-EMPTION

PRE-EMPTION OPERATION NOTES

ⓐ G/~~G~~ WHEN RETURNING TO NORMAL OPERATION

ⓑ G WHEN RETURNING TO NORMAL OPERATION

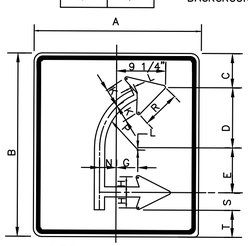
SIGN F

SIGN SIZE	DIMENSIONS A	B	C	D	E	G	H	J	K	L	M
30X33	30	33	6 3/4	11 1/4	5	3 3/4	4	1/2	4 5/16	9/16	5/8

DIMENSIONS (CONT.) N	P	Q	R	S	T
3 7/8	9 1/2	1 7/8	7 5/8	5 1/4	4 3/4

MARGIN	BORDER
1/2	3/4

COLOR
LEGEND AND BORDER: BLACK NON-REFLECTORIZED
BACKGROUND: WHITE REFLECTORIZED



DETAIL--SIGN F

EMERGENCY PRE-EMPTION NOTES

CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE NORTHBOUND AND SOUTHBOUND APPROACHES OF BETHLEHEM PIKE (S.R. 2018) AND THE EASTBOUND APPROACH OF SUMNEYTOWN PIKE AND WESTBOUND APPROACH OF NORRISTOWN ROAD (S.R. 2052) WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION.

THIS EMERGENCY BEACON SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT, AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH.

THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY, FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS, ACCORDINGLY. THEN THE GREEN INTERVAL FOR THE PRE-EMPTION PHASE SHALL FOLLOW. ONLY THOSE PHASES NOT POSING A YELLOW TRAP CONDITION MAY REMAIN GREEN (2+5, 1+6, 3+8, 4+7) WHEN GOVERNED BY APPROACHING EMERGENCY VEHICLE.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PRE-EMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.

IF SIGNALS HAVE BEEN ACTUATED BY A PEDESTRIAN PUSHBUTTON, AND THE SIGNAL IS PRE-EMPTED, THE PED "WALK (MAN)" INTERVAL SHALL TERMINATE IMMEDIATLY AND THE PED "CLEAR (FLASHING HAND AND COUNTDOWN TIMER)" INTERVAL SHALL TIME OUT THIS INTERVAL FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES, BEFORE GOING INTO EMERGENCY PRE-EMPTION.

IF THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ARE FLASHING, ALL SIGNALS SHALL REMAIN FLASHING.

IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.

UPON COMPLETION OF PRE-EMPTION PHASE 2, 4, 6 OR 8, IN RETURNING TO NORMAL OPERATION, PHASE 2+6, INTERVAL 12 SHALL FOLLOW.

IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED, PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.

SCALE

25 0 25

LEGEND

- 20' MAST ARM/ IDENTIFYING LENGTH
- VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER
- PEDESTRIAN PUSHBUTTON/ SIGN
- SIGN/IDENTIFYING LETTER
- VIDEO DETECTOR
- OMNI DIRECTIONAL VIDEO DETECTOR
- C.C. CONTROLLER CABINET
- 12'x6' LOOP SENSOR/SIZE
- ZONE OF DETECTION
- MICROWAVE PRESENCE DETECTOR
- EMERGENCY PRE-EMPTION FLASHING BEACON
- EMERGENCY PRE-EMPTION DEVICE
- C.R. CURB RAMP
- UTILITY POLE
- PHASE NUMBER
- INLET
- DILEMMA ZONE DETECTOR

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SYSTEM PERMIT# I-0108

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD

INTERSECTION: BETHLEHEM PIKE (SR 2018)
SUMNEYTOWN PIKE/NORRISTOWN ROAD (SR 2052)

REVIEWED:

MIMI GLEASON — DATE 1/17/23
MUNICIPAL OFFICIAL

RECOMMENDED:

PAUL M. LUTZ — 5/24/98

DOUGLAS W. MAY — 6/4/98
DISTRICT TRAFFIC ENGINEER — DATE

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SHEET 3 OF 3 | PERMIT # 64-1048 | FILE # 1048

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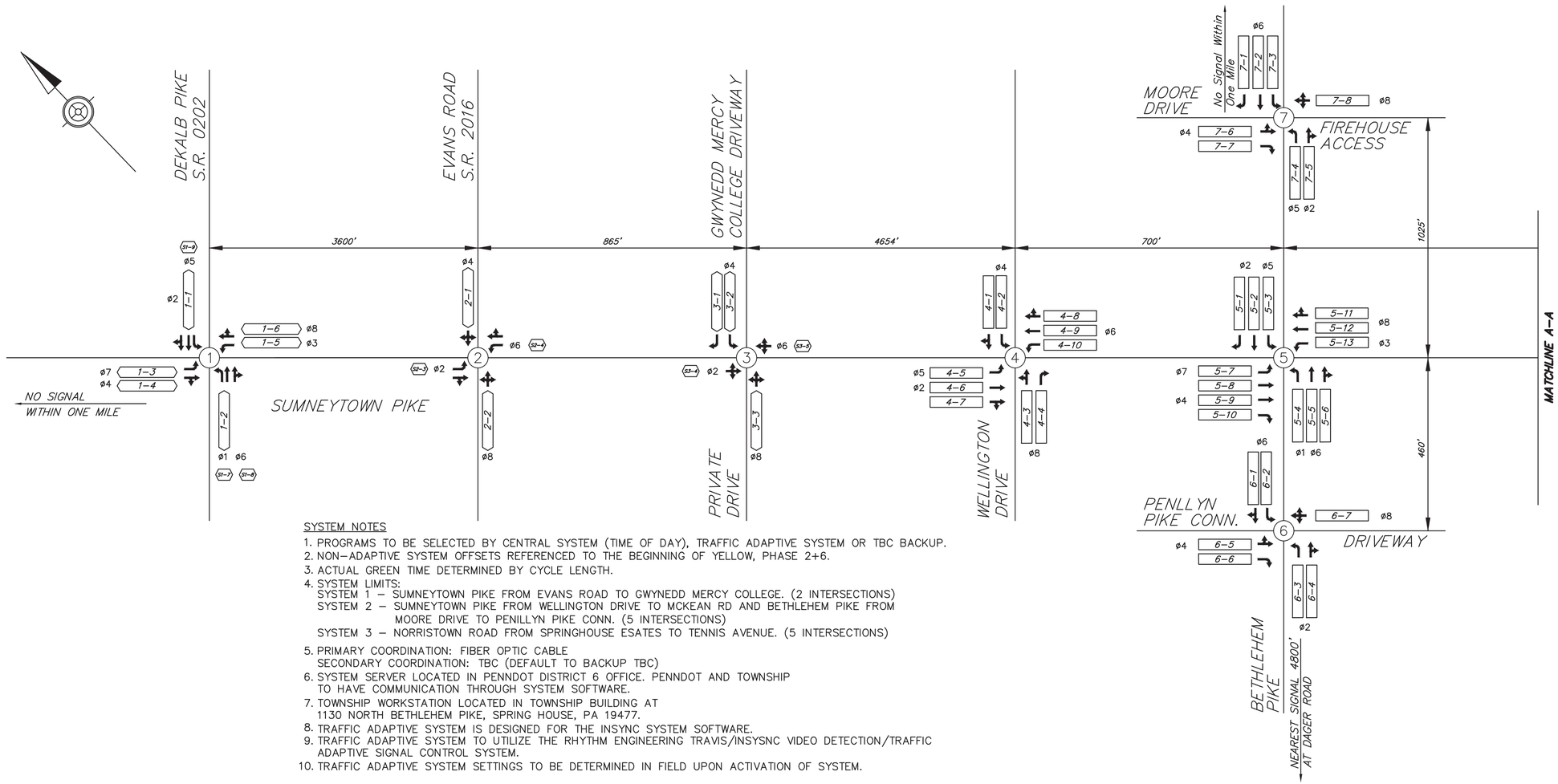
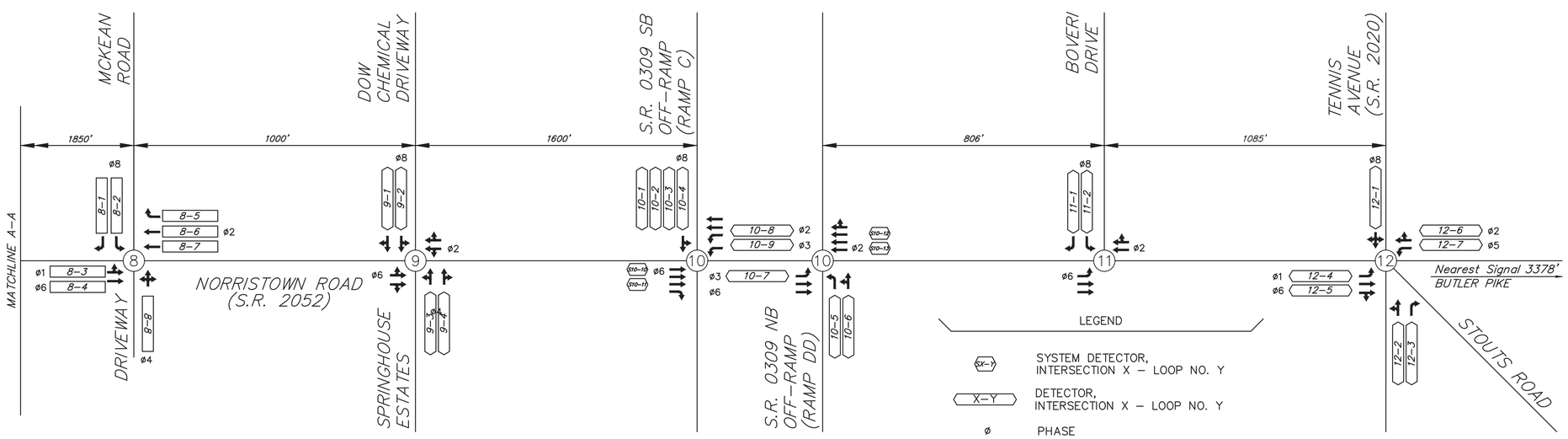


SYSTEM NOTES

1. PROGRAMS TO BE SELECTED BY CENTRAL SYSTEM (TIME OF DAY), TRAFFIC ADAPTIVE SYSTEM OR TBC BACKUP.
2. NON–ADAPTIVE SYSTEM OFFSETS REFERENCED TO THE BEGINNING OF YELLOW, PHASE 2+6.
3. ACTUAL GREEN TIME DETERMINED BY CYCLE LENGTH.
4. SYSTEM LIMITS:
   SYSTEM 1 – SUMNEYTOWN PIKE FROM EVANS ROAD TO GWYNEDD MERCY COLLEGE. (2 INTERSECTIONS)
   SYSTEM 2 – SUMNEYTOWN PIKE FROM WELLINGTON DRIVE TO MCKEAN RD AND BETHLEHEM PIKE FROM MOORE DRIVE TO PENILLYN PIKE CONN. (5 INTERSECTIONS)
   SYSTEM 3 – NORRISTOWN ROAD FROM SPRINGHOUSE ESATES TO TENNIS AVENUE. (5 INTERSECTIONS)
5. PRIMARY COORDINATION: FIBER OPTIC CABLE
   SECONDARY COORDINATION: TBC (DEFAULT TO BACKUP TBC)
6. SYSTEM SERVER LOCATED IN PENNDOT DISTRICT 6 OFFICE. PENNDOT AND TOWNSHIP TO HAVE COMMUNICATION THROUGH SYSTEM SOFTWARE.
7. TOWNSHIP WORKSTATION LOCATED IN TOWNSHIP BUILDING AT 1130 NORTH BETHLEHEM PIKE, SPRING HOUSE, PA 19477.
8. TRAFFIC ADAPTIVE SYSTEM IS DESIGNED FOR THE INSYNC SYSTEM SOFTWARE.
9. TRAFFIC ADAPTIVE SYSTEM TO UTILIZE THE RHYTHM ENGINEERING TRAVIS/INSYSNC VIDEO DETECTION/TRAFFIC ADAPTIVE SIGNAL CONTROL SYSTEM.
10. TRAFFIC ADAPTIVE SYSTEM SETTINGS TO BE DETERMINED IN FIELD UPON ACTIVATION OF SYSTEM.



LEGEND

- SYSTEM DETECTOR, INTERSECTION X – LOOP NO. Y
- DETECTOR, INTERSECTION X – LOOP NO. Y
- ø PHASE
- VIDEO DETECTION LOOP

SCALE: NOT TO SCALE

GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC–8800 SERIES.

SYSTEM PERMIT PLAN

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6–0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: SUMNEYTOWN PIKE FROM DEKALB PIKE TO BETHLEHEM PIKE, NORRISTOWN ROAD FROM BETHLEHEM PIKE TO TENNIS AVENUE, BETHLEHEM PIKE FROM PENLLYN PIKE TO MOORE ROAD

REVIEWED:

DocuSigned by: Mimi Gleason A145F15B8B04FA... — DATE 1/17/2023
MUNICIPAL OFFICIAL — DATE

RECOMMENDED:

DAVID ADAMS — 4/17/12

ASHWIN B. PATEL — 4/24/12
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	REVISED TIMINGS, ADDED INCIDENT TIMINGS, ADDED INTERSECTIONS 1–3 AND 8–12, RENUMBERED INTERSECTIONS, PROVIDED CENTRAL SERVER COMMUNICATIONS	JE	7/26/13	DLA	9/17/13	LRB	9/17/13
2	ADDED EB LEFT TURN LANE, INT#3 & RENUMB WEEKLY PROGRAM CHART	HCA	1/23/14	DLA	6/6/14	ABP	6/16/14
3	ADD ADAPTIVE SYSTEM TO INTERSECTIONS #4,5,6,7&8	MCM		DLA	8/18/16	ABP	8/18/16
4	REVISE INT #4&5 LANE CONFIG, RE–TIME INT #4–7	TPD		DLA	8/18/16	ABP	8/18/16
5	ADD PHASE 3 TO INT #1	TPD	8/10/17	KPL	8/17/16	DLA	8/18/17
6	ADD PHASE 7 TO INT #5	MCM	9/28/17	KPL	10/12/17	DLA	10/13/17
7	AS–BUILT ADAPTIVE SETTINGS	MCM		KPL	1/31/19	DLA	2/27/19
8	REVISE INT #4&5 LANE CONFIG, RE–TIME INT #4&5	MCM	10/27/22	KPL	Digitally signed by Kelly Pennington DN: cn=Kelly Pennington, o=PennDOT, ou=District 6-0, email=kelpenn@pa.gov, c=US Date: 2023.01.05 08:47:00 -05'00'	ABP	Digitally signed by ABP DN: cn=ABP, o=PennDOT, ou=District 6-0, email=abp@pa.gov, c=US Date: 2023.01.05 08:47:00 -05'00'

SHEET 1 OF 3 | PERMIT # I–0108 | FILE #

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ADAPTIVE PROGRAM 1

Lower Gwynedd

NB/SB

	CONFIGURATION: PM Peak INTERSECTIONS	TUNNEL PHASE DURATION (SEC) NB	TUNNEL PHASE DURATION (SEC) SB	PERIOD	GLOBAL OFFSET (AT FACILITATOR [SEC])	LOCAL OFFSET (SEC) NB	LOCAL OFFSET (SEC) SB	TRAVEL TIME TO NEXT INTERSECTION (SEC)	
1	Bethlehem Pike and Moore Rd	Φ 2 = 33	Φ 6 = 23	120		Φ 2 = -5	Φ 6 = 5	Φ 2 = n/a	Φ 6 = 20
2	Sumneytown Pike and Bethleham Pike	Φ 6 = 34	Φ 2 = 26	120		Φ 6 = -5	Φ 2 = 3	Φ 6 = 20	Φ 2 = 8
3	Bethlehem Pike and Penllyn Pike	Φ 2 = 25	Φ 6 = 31	120		Φ 2 = 7	Φ 6 = 2	Φ 2 = 8	Φ 6 = n/a

EB/WB

	CONFIGURATION: PM Peak INTERSECTIONS	TUNNEL PHASE DURATION (SEC) EB	TUNNEL PHASE DURATION (SEC) WB	PERIOD	GLOBAL OFFSET (AT FACILITATOR [SEC])	LOCAL OFFSET (SEC) EB	LOCAL OFFSET (SEC) WB	TRAVEL TIME TO NEXT INTERSECTION (SEC)	
4	Sumneytown Pike and Wellington Dr	Φ 2 = 33	Φ 6 = 35	120		Φ 2 = 0	Φ 6 = -4	Φ 2 = 11	Φ 6 = n/a
2	Sumneytown Pike and Bethleham Pike	Φ 4 = 31	Φ 8 = 30	120		Φ 4 = 0	Φ 8 = -1	Φ 4 = 28	Φ 8 = 11
5	Norristown Rd and McKean	Φ 6 = 43	Φ 2 = n/a	120		Φ 6 = -7	Φ 2 = n/a	Φ 6 = n/a	Φ 2 = n/a

Updated 02/27/18

GLOBAL OFFSET (AT FACILITATOR): Value in seconds that offsets a tunnel globally at the facilitaor intersection as entered in In|Traffic

LOCAL OFFSET: Tunnel offset at intersection as entered in In|Traffic

TRAVEL TIME TO NEXT INTERSECTION: Value for travel time of the chosen tunnel to the corresponding tunnel at the next intersection as entered in In|Traffic map view

ADAPTIVE PROGRAM 2

Lower Gwynedd

NB/SB

	CONFIGURATION: Midday INTERSECTIONS	TUNNEL PHASE DURATION (SEC) NB	TUNNEL PHASE DURATION (SEC) SB	PERIOD	GLOBAL OFFSET (AT FACILITATOR [SEC])	LOCAL OFFSET (SEC) NB	LOCAL OFFSET (SEC) SB	TRAVEL TIME TO NEXT INTERSECTION (SEC)	
1	Bethlehem Pike and Moore Rd	Φ 2 = 22	Φ 6 = 24	100		Φ 2 = 4	Φ 6 = 12	Φ 2 = n/a	Φ 6 = 20
2	Sumneytown Pike and Bethleham Pike	Φ 6 = 22	Φ 2 = 20	100		Φ 6 = 7	Φ 2 = 9	Φ 6 = 20	Φ 2 = 8
3	Bethlehem Pike and Penllyn Pike	Φ 2 = 18	Φ 6 = 24	100		Φ 2 = 11	Φ 6 = 9	Φ 2 = 8	Φ 6 = n/a

EB/WB

	CONFIGURATION: Midday INTERSECTIONS	TUNNEL PHASE DURATION (SEC) EB	TUNNEL PHASE DURATION (SEC) WB	PERIOD	GLOBAL OFFSET (AT FACILITATOR [SEC])	LOCAL OFFSET (SEC) EB	LOCAL OFFSET (SEC) WB	TRAVEL TIME TO NEXT INTERSECTION (SEC)	
4	Sumneytown Pike and Wellington Dr	Φ 2 = 25	Φ 6 = 22	100		Φ 2 = -4	Φ 6 = -1	Φ 2 = 11	Φ 6 = n/a
2	Sumneytown Pike and Bethleham Pike	Φ 4 = 25	Φ 8 = 22	100		Φ 4 = -4	Φ 8 = -1	Φ 4 = 28	Φ 8 = 11
5	Norristown Rd and McKean	Φ 6 = 35	Φ 2 = n/a	100		Φ 6 = -7	Φ 2 = n/a	Φ 6 = n/a	Φ 2 = n/a

Updated 02/27/18

GLOBAL OFFSET (AT FACILITATOR): Value in seconds that offsets a tunnel globally at the facilitaor intersection as entered in In|Traffic

LOCAL OFFSET: Tunnel offset at intersection as entered in In|Traffic

TRAVEL TIME TO NEXT INTERSECTION: Value for travel time of the chosen tunnel to the corresponding tunnel at the next intersection as entered in In|Traffic map view

ADAPTIVE PROGRAM 3

Lower Gwynedd

NB/SB

	CONFIGURATION: PM Peak INTERSECTIONS	TUNNEL PHASE DURATION (SEC) NB	TUNNEL PHASE DURATION (SEC) SB	PERIOD	GLOBAL OFFSET (AT FACILITATOR [SEC])	LOCAL OFFSET (SEC) NB	LOCAL OFFSET (SEC) SB	TRAVEL TIME TO NEXT INTERSECTION (SEC)	
1	Bethlehem Pike and Moore Rd	Φ 2 = 33	Φ 6 = 23	120		Φ 2 = -5	Φ 6 = 5	Φ 2 = n/a	Φ 6 = 20
2	Sumneytown Pike and Bethleham Pike	Φ 6 = 34	Φ 2 = 26	120		Φ 6 = -5	Φ 2 = 3	Φ 6 = 20	Φ 2 = 8
3	Bethlehem Pike and Penllyn Pike	Φ 2 = 25	Φ 6 = 31	120		Φ 2 = 7	Φ 6 = 2	Φ 2 = 8	Φ 6 = n/a

EB/WB

	CONFIGURATION: PM Peak INTERSECTIONS	TUNNEL PHASE DURATION (SEC) EB	TUNNEL PHASE DURATION (SEC) WB	PERIOD	GLOBAL OFFSET (AT FACILITATOR [SEC])	LOCAL OFFSET (SEC) EB	LOCAL OFFSET (SEC) WB	TRAVEL TIME TO NEXT INTERSECTION (SEC)	
4	Sumneytown Pike and Wellington Dr	Φ 2 = 33	Φ 6 = 35	120		Φ 2 = 0	Φ 6 = -4	Φ 2 = 11	Φ 6 = n/a
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5	Norristown Rd and McKean	Φ 6 = 43	Φ 2 = n/a	120		Φ 6 = -7	Φ 2 = n/a	Φ 6 = n/a	Φ 2 = n/a

Updated 02/27/18

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ADAPTIVE PROGRAM CHART

EVENT	DAY	TIME	PERIOD	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX.1	FREE
2	2–6	06:00	120	–	1	AM PEAK
3	1,7	09:00	100	–	2	MIDDAY
4	2–6	09:30	100	–	2	MIDDAY
5	2–6	15:00	120	–	2	PM PEAK
6	2–6	19:00	100	–	3	MIDAAY
7	1–7	21:00	–	–	MAX.1	FREE

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SYSTEM PERMIT PLAN

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

ENGINEERING DISTRICT 6–0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: SUMNEYTOWN PIKE FROM DEKALB PIKE TO BETHLEHEM PIKE, NORRISTOWN ROAD FROM BETHLEHEM PIKE TO TENNIS AVENUE, BETHLEHEM PIKE FROM PENLLYN PIKE TO MOORE ROAD

REVIEWED:

DocuSigned by: Mimi Gleason 4166F1E4D0D04F4... 1/17/2023

MUNICIPAL OFFICIAL — DATE

RECOMMENDED:

DAVID ADAMS — 4/17/12

ASHWIN B. PATEL — 4/24/12

DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DES./REVM.	DATE	REVW.	DATE	RECOM.	DATE
1	REVISED TIMINGS, ADDED INCIDENT TIMINGS, ADDED INTERSECTIONS 1–3 AND 8–12, RENUMBERED INTERSECTIONS, PROVIDED CENTRAL SERVER COMMUNICATIONS	JE	7/26/13	DLA	9/17/13	LRB	9/17/13
2	ADDED EB LEFT TURN LANE, INT#3 & RENUMB WEEKLY PROGRAM CHART	HCA	1/23/14	DLA	6/6/14	ABP	6/16/14
3	ADD ADAPTIVE SYSTEM TO INTERSECTIONS #4,5,6,7&8	MCM		DLA	8/18/16	ABP	8/18/16
4	REVISE INT #4&5 LANE CONFIG, RE–TIME INT #4–7	TPD		DLA	8/18/16	ABP	8/18/16
5	ADD PHASE 3 TO INT #1	TPD	8/10/17	KPL	8/17/16	DLA	8/18/17
6	ADD PHASE 7 TO INT #5	MCM	9/28/17	KPL	10/12/17	DLA	10/13/17
7	AS–BUILT ADAPTIVE SETTINGS	MCM		KPL	1/31/19	DLA	2/27/19
8	REVISE INT #4&5 LANE CONFIG, RE–TIME INT #4&5	MCM	10/27/22	KPL	Digitally signed by KPL Date: 2023.01.18 10:58:12 -05'00'	ABP	Digitally signed by ABP Date: 2023.01.18 10:58:12 -05'00'

SHEET 2 OF 3 | PERMIT # I–0108 | FILE #

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WEEKLY PROGRAM CHART INTERSECTION 1

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX.1	VOLUME DENSITY
2	1–5	06:30	90	–	1	AM PEAK
3	1–5	09:00	–	–	MAX.1	VOLUME DENSITY
4	1–5	15:00	120	–	2	PM PEAK
5	1–5	19:00	–	–	MAX.1	VOLUME DENSITY

MONDAY = DAY 1

WEEKLY PROGRAM CHART INTERSECTIONS 2–3

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX.1	FREE
2	1–5	06:00	120	–	1	AM PEAK
3	6	08:00	75	–	2	OFF PEAK
4	1–5	09:30	75	–	2	OFF PEAK
5	7	10:00	75	–	2	OFF PEAK
6	1–5	14:00	85	–	3	EARLY AFTERNOON
7	1–5	16:00	95	–	4	PM PEAK
8	7	18:00	–	–	MAX.1	FREE
9	1–5	18:30	75	–	2	OFF PEAK
10	1–6	20:00	–	–	MAX.1	FREE

MONDAY = DAY 1
OFFSET IN SECONDS

WEEKLY/BACKUP PROGRAM CHART INTERSECTIONS 4–7

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX.1	FREE
2	1–5	06:00	120	–	1	AM PEAK
3	6	09:00	100	–	2	OFF PEAK
4	1–5	09:30	100	–	2	OFF PEAK
5	7	10:00	100	–	2	OFF PEAK
6	1–5	15:00	120	–	3	PM PEAK
7	1–5	19:00	100	–	2	OFF PEAK
8	7	20:00	–	–	MAX.1	FREE
9	1–5	20:30	–	–	MAX.1	FREE
10	6	21:00	–	–	MAX.1	FREE

WEEKLY/BACKUP PROGRAM CHART INTERSECTIONS 8

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX.1	FREE
2	1–5	06:00	100	–	1	AM PEAK
3	6	09:00	85	–	2	OFF PEAK
4	1–5	09:30	85	–	2	OFF PEAK
5	7	10:00	85	–	2	OFF PEAK
6	1–5	15:00	90	–	3	PM PEAK
7	7	18:00	–	–	MAX.1	FREE
8	1–5	19:00	85	–	2	OFF PEAK
9	6	19:00	–	–	MAX.1	FREE
10	1–5	20:30	–	–	MAX.1	FREE

WEEKLY PROGRAM CHART INTERSECTIONS 9–12

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX.1	FREE
2	1–5	06:00	100	–	1	AM PEAK
3	6	09:00	85	–	2	OFF PEAK
4	1–5	09:30	85	–	2	OFF PEAK
5	7	10:00	85	–	2	OFF PEAK
6	1–5	15:00	90	–	3	PM PEAK
7	7	18:00	–	–	MAX.1	FREE
8	1–5	19:00	85	–	2	OFF PEAK
9	6	19:00	–	–	MAX.1	FREE
10	1–5	20:30	–	–	MAX.1	FREE

CYCLE/SPLIT/OFFSET

	PROGRAM 1	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	20(LEAD)	30	13(LEAD)	27	20(LEAD)	30	13(LEAD)	27	90	0	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		80		40		80		40	120	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		97		23		97		23	120	0	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		77		23		77		23	100	46	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		43	12(LAG)	32(SPLIT)		43		13(SPLIT)	100	80	
11	NORRISTOWN ROAD/BOVERI DR	3676		76				76		24	100	18	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	41		46	13(LEAD)	41	13(LEAD)	33	100	1	
	PROGRAM 2	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	14(LEAD)	41	17(LEAD)	48	14(LEAD)	41	17(LEAD)	48	120	0	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		53		22		53		22	75	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		49		26		49		26	75	62	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		57		28		57		28	85	11	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		32	14(LAG)	22(SPLIT)		32		17(SPLIT)	85	48	
11	NORRISTOWN ROAD/BOVERI DR	3676		56				56		29	85	75	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	35		37	13(LEAD)	35	13(LEAD)	24	85	78	
	PROGRAM 3	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961											
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		62		23		62		23	85	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		58		27		58		27	85	81	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		66		24		66		24	90	58	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		38	12(LAG)	27(SPLIT)		38		13(SPLIT)	90	0	
11	NORRISTOWN ROAD/BOVERI DR	3676		59				59		31	90	2	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	38		39	13(LEAD)	38	13(LEAD)	26	90	54	
	PROGRAM 4	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961											
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		67		28		67		28	95	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		69		26		69		26	95	89	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679											
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151											
11	NORRISTOWN ROAD/BOVERI DR	3676											
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031											
	PROGRAM 11 – AM I–476 NORTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	24(LEAD)	37	14(LEAD)	50	19(LEAD)	42	14(LEAD)	50	125	30	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		90		30		90		30	120	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		97		23		97		23	120	105	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		47		23		47		23	70	34	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		40	13(LAG)	72(SPLIT)		40		15(SPLIT)	140	136	
11	NORRISTOWN ROAD/BOVERI DR	3676		48				48		22	70	3	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	14(LEAD)	63		63	13(LEAD)	64	13(LEAD)	50	140	62	
	PROGRAM 12 – PM I–476 NORTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	21(LEAD)	46	19(LEAD)	59	24(LEAD)	43	19(LEAD)	59	145	0	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		109		31		109		31	140	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		115		25		115		25	140	132	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		52		23		52		23	75	11	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		54	13(LAG)	68(SPLIT)		54		15(SPLIT)	150	75	
11	NORRISTOWN ROAD/BOVERI DR	3676		48				48		27	75	70	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	25		37	13(LEAD)	25	13(LEAD)	24	75	20	
	PROGRAM 13 – AM I–476 SOUTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	24(LEAD)	39	13(LEAD)	69	14(LEAD)	49	13(LEAD)	69	145	32	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		113		37		113		37	150	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		123		27		123		27	150	16	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		47		23		47		23	70	30	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		70	13(LAG)	42(SPLIT)		70		15(SPLIT)	140	111	
11	NORRISTOWN ROAD/BOVERI DR	3676		48				48		22	70	29	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	14(LEAD)	63		63	13(LEAD)	64	13(LEAD)	50	140	101	
	PROGRAM 14 – PM I–476 SOUTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	21(LEAD)	46	19(LEAD)	59	24(LEAD)	43	19(LEAD)	59	145	57	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		71		24		71		24	95	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		72		23		72		23	95	16	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		52		23		52		23	75	58	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		86	13(LAG)	36(SPLIT)		86		15(SPLIT)	150	62	
11	NORRISTOWN ROAD/BOVERI DR	3676		48				48		27	75	55	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	25		37	13(LEAD)	25	13(LEAD)	24	75	39	

NOTES:
– ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.
– REFER TO THE SIGNAL PERMIT PLAN FOR MAX I, MAX II, CLEARANCE AND PED TIMES.

CYCLE/SPLIT/OFFSET

	PROGRAM 15 –AM I–476 BI–DIRECTIONAL DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	26(LEAD)	39	13(LEAD)	67	21(LEAD)	44	13(LEAD)	67	145	0	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		116		34		116		34	150	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		123		27		123		27	150	147	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		52		23		52		23	75	11	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		58	13(LAG)	64(SPLIT)		58		15(SPLIT)	150	130	
11	NORRISTOWN ROAD/BOVERI DR	3676		52				52		23	75	47	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	25		37	13(LEAD)	25	13(LEAD)	24	75	25	
	PROGRAM 16 – PM I–476 BI–DIRECTIONAL DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
1	SUMNEYTOWN PIKE/DEKALB PIKE	0961	15(LEAD)	42	16(LEAD)	72	24(LEAD)	33	16(LEAD)	72	145	0	
2	SUMNEYTOWN PIKE/EVANS ROAD	2687		102		28		102		28	130	0	
3	SUMNEYTOWN PIKE/GWYNEDD MERCY COLLEGE DWY	2119		106		24		106		24	130	127	
9	NORRISTOWN ROAD/SPRINGHOUSE ESTATES/DOW CHEMICAL DWY	1679		125		25		125		25	150	121	
10	NORRISTOWN ROAD/S.R. 0309 RAMPS	2151		59	13(LAG)	63(SPLIT)		59		15(SPLIT)	150	112	
11	NORRISTOWN ROAD/BOVERI DR	3676		48				48		27	75	38	
12	NORRISTOWN ROAD/TENNIS AVE/STOUTS RD	2031	13(LEAD)	25		37	13(LEAD)	25	13(LEAD)	24	75	54	

BACKUP CYCLE/SPLIT/OFFSET

	PROGRAM 1	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		83		37	14(LEAD)	69		37	120	84	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	18(LEAD)	44	22(LEAD)	36	19(LEAD)	43	15(LEAD)	43	120	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		64		56		64		56	120	29	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		87		33	14(LEAD)	73		33	120	24	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	20(LEAD)	43		37		63		37	100	6	
	PROGRAM 2	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		70		30	26(LEAD)	44		30	100	81	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	16(LEAD)	33	24(LEAD)	27	15(LEAD)	34	15(LEAD)	36	100	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		54		46		54		46	100	32	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		67		33	14(LEAD)	53		33	100	3	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	13(LEAD)	47		25		60		25	85	26	
	PROGRAM 3	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		106		14	14(LEAD)	92		14	120	113	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	27(LEAD)	32	29(LEAD)	32	14(LEAD)	45	15(LEAD)	46	120	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		56		64		56		64	120	30	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		83		37	17(LEAD)	66		37	120	99	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	13(LEAD)	53		24		66		24	90	43	
	PROGRAM 4	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042											
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048											
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788											
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043											
8	NORRISTOWN ROAD/MCKEAN ROAD	3282											
	PROGRAM 11 – AM I–476 NORTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		122		18	14(LEAD)	108		18	140	120	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	15(LEAD)	32	24(LEAD)	69	14(LEAD)	33	15(LEAD)	78	140	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		38		32		38		32	70	5	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		50		20	14(LEAD)	36		20	70	48	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	13(LEAD)	78		49		91		49	140	118	
	PROGRAM 12 – PM I–476 NORTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		130		20	14(LEAD)	116		20	150	138	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	15(LEAD)	37	36(LEAD)	62	14(LEAD)	38	15(LEAD)	83	150	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		35		40		35		40	75	4	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		55		20	14(LEAD)	41		20	75	6	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	13(LEAD)	103		34		116		34	150	25	
	PROGRAM 13 – AM I–476 SOUTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		52		18	14(LEAD)	38		18	70	5	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	17(LEAD)	34	17(LEAD)	72	14(LEAD)	37	15(LEAD)	74	140	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		40		30		40		30	70	5	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		50		20	14(LEAD)	36		20	70	49	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	15(LEAD)	81		44		96		44	140	112	
	PROGRAM 14 – PM I–476 SOUTHBOUND DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		55		20	14(LEAD)	41		20	75	34	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	23(LEAD)	40	26(LEAD)	61	14(LEAD)	49	15(LEAD)	72	150	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		38		37		38		37	75	4	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		55		20	14(LEAD)	41		20	75	6	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	13(LEAD)	110		27		123		27	150	147	
	PROGRAM 15 –AM I–476 BI–DIRECTIONAL DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		132		18	14(LEAD)	118		18	150	136	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	16(LEAD)	33	20(LEAD)	81	14(LEAD)	35	15(LEAD)	86	150	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		43		32		43		32	75	7	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		55		20	14(LEAD)	41		20	75	54	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	14(LEAD)	89		47		103		47	150	100	
	PROGRAM 16 – PM I–476 BI–DIRECTIONAL DIVERSION	FILE #	PHASE								CYCLE	OFFSET #1	OFFSET #2
	INTERSECTIONS		1	2	3	4	5	6	7	8			
4	SUMNEYTOWN PIKE/WELLINGTON DR	3042		130		20	14(LEAD)	116		20	150	144	
5	BETHLEHEM PIKE/NORRISTOWN ROAD	1048	17(LEAD)	41	23(LEAD)	69	14(LEAD)	44	15(LEAD)	77	150	0	
6	BETHLEHEM PIKE/PENLLYN PIKE CONN./DRIVEWAY	1788		38		37		38		37	75	1	
7	BETHLEHEM PIKE/MOORE DR/FIREHOUSE ACCESS	3043		55		20	14(LEAD)	41		20	75	5	
8	NORRISTOWN ROAD/MCKEAN ROAD	3282	13(LEAD)	110		27		123		27	150	130	

GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC–8800 SERIES.

SYSTEM PERMIT PLAN

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6–0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER GWYNEDD TOWNSHIP

INTERSECTION: SUMNEYTOWN PIKE FROM DEKALB PIKE TO BETHLEHEM PIKE, NORRISTOWN ROAD FROM BETHLEHEM PIKE TO TENNIS AVENUE, BETHLEHEM PIKE FROM PENLLYN PIKE TO MOORE ROAD

APPENDIX J:

Auxiliary Turn Lane Warrant Analysis

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Lower Gwynedd Township	**Analysis Date:**	1/25/2026
County:	Montgomery County	**Conducted By:**	BH
PennDOT Engineering District:	6	**Checked By:**	MB
		Agency/Company Name:	TPD, Inc.

Intersection & Approach Description: Norristown Road (SR 2052) and Boveri Drive - Site Driveway

Analysis Period:	2032 Build with SHIP	**Number of Approach Lanes:**	2
Design Hour:	AM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	147	2.0%	149
	Through	-	744	4.0%	759
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	802	2.0%	811
	Right	Yes	59	13.0%	63

Advancing Volume:	908
Opposing Volume:	874
Left Turn Volume:	149
% Left Turns in Advancing Volume:	16.41%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	N/A
	Through	-	802	2.0%	N/A
	Right	-	59	13.0%	N/A

Advancing Volume:	N/A
Right Turn Volume:	N/A

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 7**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	149
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40
Average # of Vehicles/Cycle:	4.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

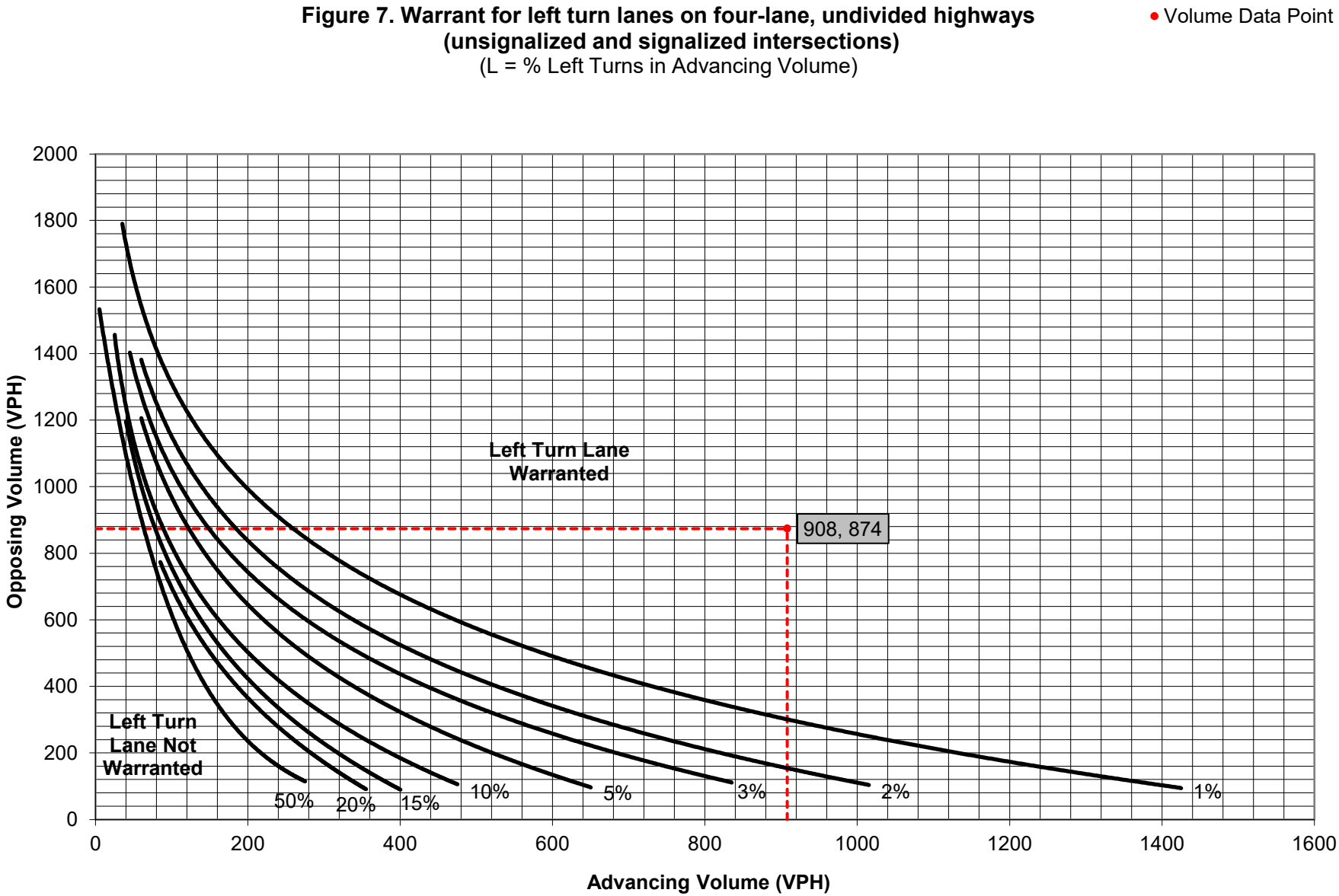
Left Turn Lane Storage Length, Condition A:	**N/A**	**Feet**
Condition B:	**125**	**Feet**
Condition C:	**250**	**Feet**
Required Left Turn Lane Storage Length:	**250**	**Feet**

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 7. Warrant for left turn lanes on four-lane, undivided highways (unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Lower Gwynedd Township	Analysis Date:	1/25/2026
County:	Montgomery County	Conducted By:	BH
PennDOT Engineering District:	6	Checked By:	MB
		Agency/Company Name:	TPD, Inc.

Intersection & Approach Description: Norristown Road (SR 2052) and Boveri Drive - Site Driveway

Analysis Period:	2032 Build with SHIP	Number of Approach Lanes:	2
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Level	Left or Right-Turn Lane Analysis?:	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	147	2.0%	N/A
	Through	-	744	4.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	802	2.0%	N/A
	Right	Yes	59	13.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	802	2.0%	811
	Right	-	59	13.0%	63

Advancing Volume:	874
Right Turn Volume:	63

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 12**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	63
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40
Average # of Vehicles/Cycle:	2.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

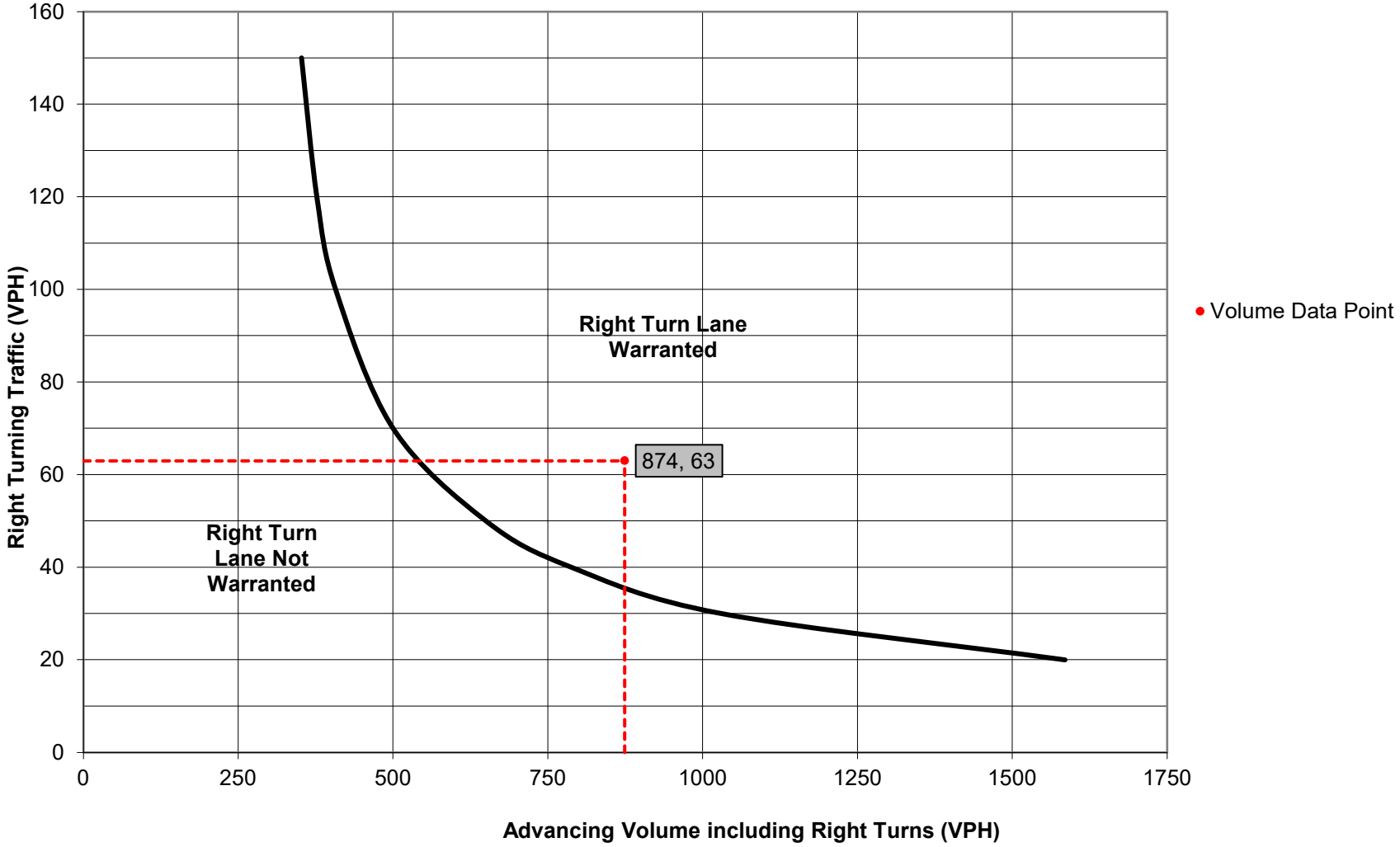
Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	175	Feet
Required Right Turn Lane Storage Length:	175	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 12. Warrant for right turn lanes on four-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Lower Gwynedd Township	Analysis Date:	1/25/2026
County:	Montgomery County	Conducted By:	BH
PennDOT Engineering District:	6	Checked By:	MB
		Agency/Company Name:	TPD, Inc.

Intersection & Approach Description: Norristown Road (SR 2052) and Boveri Drive - Site Driveway

Analysis Period:	2032 Build with SHIP	Number of Approach Lanes:	2
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Level	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	151	2.0%	153
	Through	-	1187	2.0%	1199
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	599	2.0%	605
	Right	Yes	62	2.0%	63

Advancing Volume:	1352
Opposing Volume:	668
Left Turn Volume:	153
% Left Turns in Advancing Volume:	11.32%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	N/A
	Through	-	599	2.0%	N/A
	Right	-	62	2.0%	N/A

Advancing Volume:	N/A
Right Turn Volume:	N/A

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 7**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	153
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40
Average # of Vehicles/Cycle:	4.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

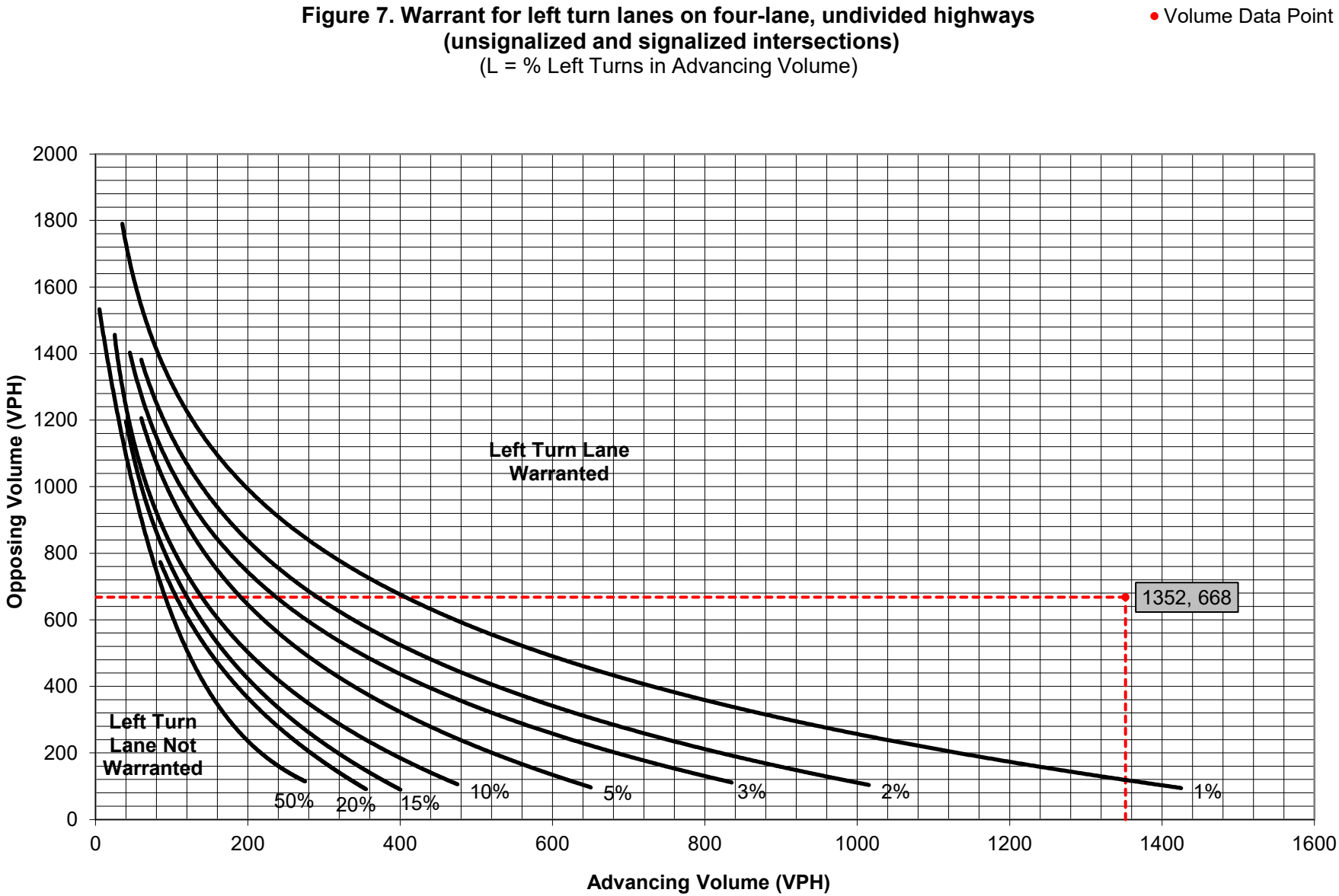
Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	250	Feet
Required Left Turn Lane Storage Length:	250	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 7. Warrant for left turn lanes on four-lane, undivided highways (unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Lower Gwynedd Township	Analysis Date:	1/25/2026
County:	Montgomery County	Conducted By:	BH
PennDOT Engineering District:	6	Checked By:	MB
		Agency/Company Name:	TPD, Inc.

Intersection & Approach Description: Norristown Road (SR 2052) and Boveri Drive - Site Driveway

Analysis Period:	2032 Build with SHIP	Number of Approach Lanes:	2
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Level	Left or Right-Turn Lane Analysis?:	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	151	2.0%	N/A
	Through	-	1187	2.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	599	2.0%	N/A
	Right	Yes	62	2.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	599	2.0%	605
	Right	-	62	2.0%	63

Advancing Volume:	668
Right Turn Volume:	63

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 12**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	63
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40
Average # of Vehicles/Cycle:	2.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

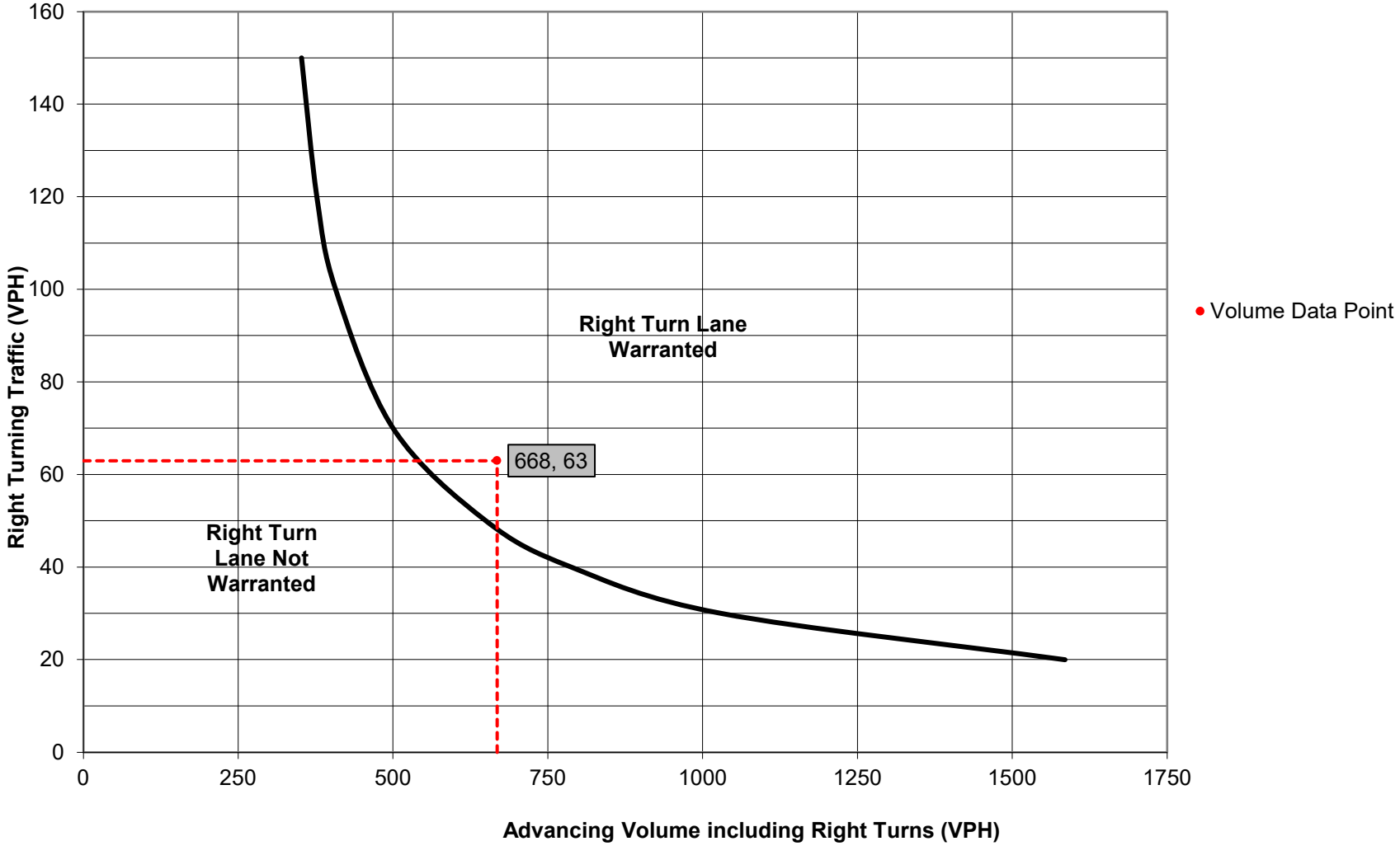
Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	175	Feet
Required Right Turn Lane Storage Length:	175	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 12. Warrant for right turn lanes on four-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Lower Gwynedd Township	**Analysis Date:**	1/25/2026
County:	Montgomery County	**Conducted By:**	BH
PennDOT Engineering District:	6	**Checked By:**	MB
		Agency/Company Name:	TPD, Inc.

Intersection & Approach Description: Norristown Road (SR 2052) and Boveri Drive - Site Driveway

Analysis Period:	2032 Build with SHIP	**Number of Approach Lanes:**	2
Design Hour:	SAT Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	170	2.0%	172
	Through	-	568	1.0%	571
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	565	0.0%	565
	Right	Yes	77	2.0%	78

Advancing Volume:	743
Opposing Volume:	643
Left Turn Volume:	172
% Left Turns in Advancing Volume:	23.15%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	N/A
	Through	-	565	0.0%	N/A
	Right	-	77	2.0%	N/A

Advancing Volume:	N/A
Right Turn Volume:	N/A

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 7**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	172
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40
Average # of Vehicles/Cycle:	4.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

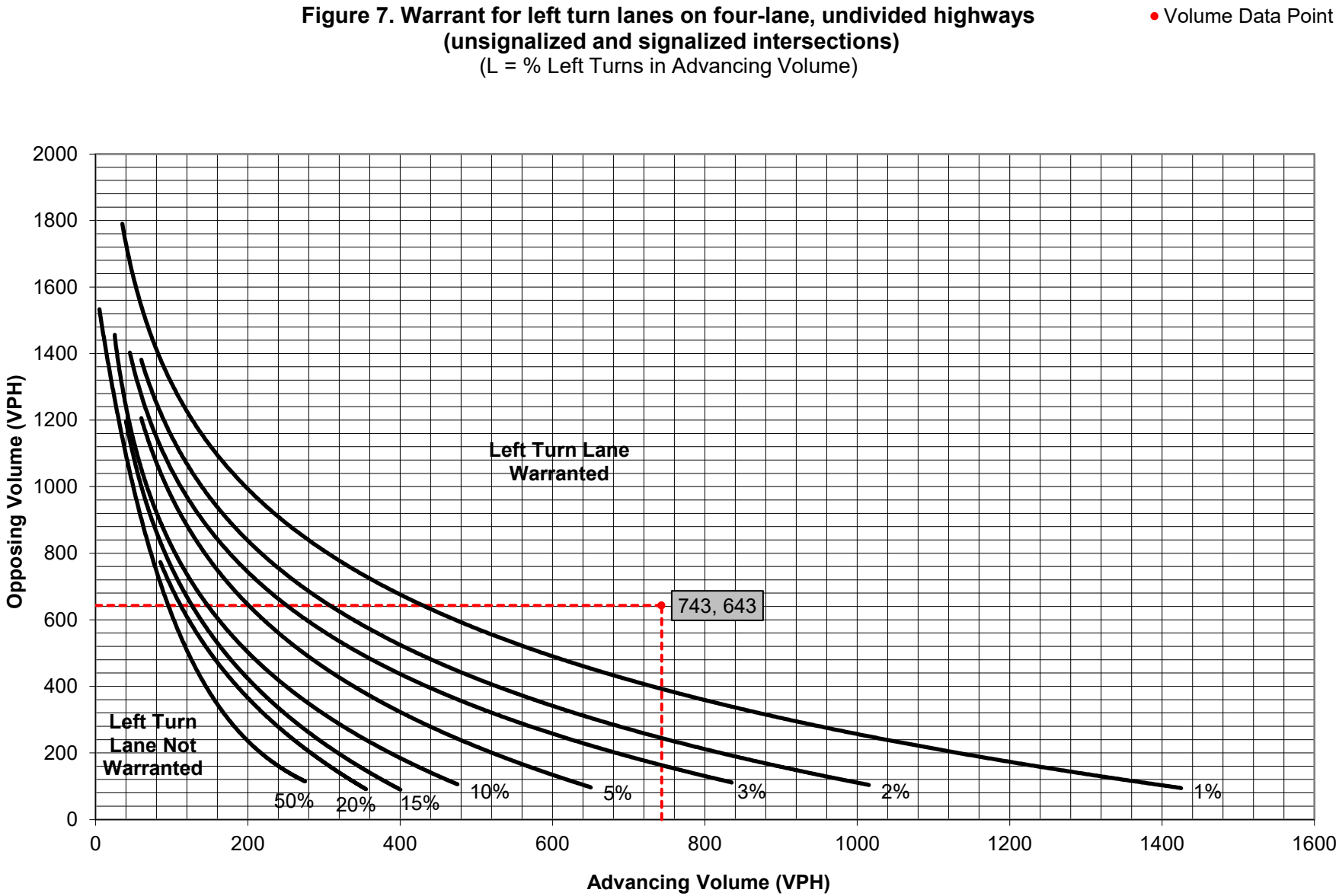
Left Turn Lane Storage Length, Condition A:	**N/A**	**Feet**
Condition B:	**125**	**Feet**
Condition C:	**250**	**Feet**
Required Left Turn Lane Storage Length:	**250**	**Feet**

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 7. Warrant for left turn lanes on four-lane, undivided highways (unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Lower Gwynedd Township	Analysis Date:	1/25/2026
County:	Montgomery County	Conducted By:	BH
PennDOT Engineering District:	6	Checked By:	MB
		Agency/Company Name:	TPD, Inc.

Intersection & Approach Description: Norristown Road (SR 2052) and Boveri Drive - Site Driveway

Analysis Period:	2032 Build with SHIP	Number of Approach Lanes:	2
Design Hour:	SAT Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Level	Left or Right-Turn Lane Analysis?:	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	170	2.0%	N/A
	Through	-	568	1.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	565	0.0%	N/A
	Right	Yes	77	2.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	565	0.0%	565
	Right	-	77	2.0%	78

Advancing Volume:	643
Right Turn Volume:	78

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 12**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	78
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	175	Feet
Required Right Turn Lane Storage Length:	175	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

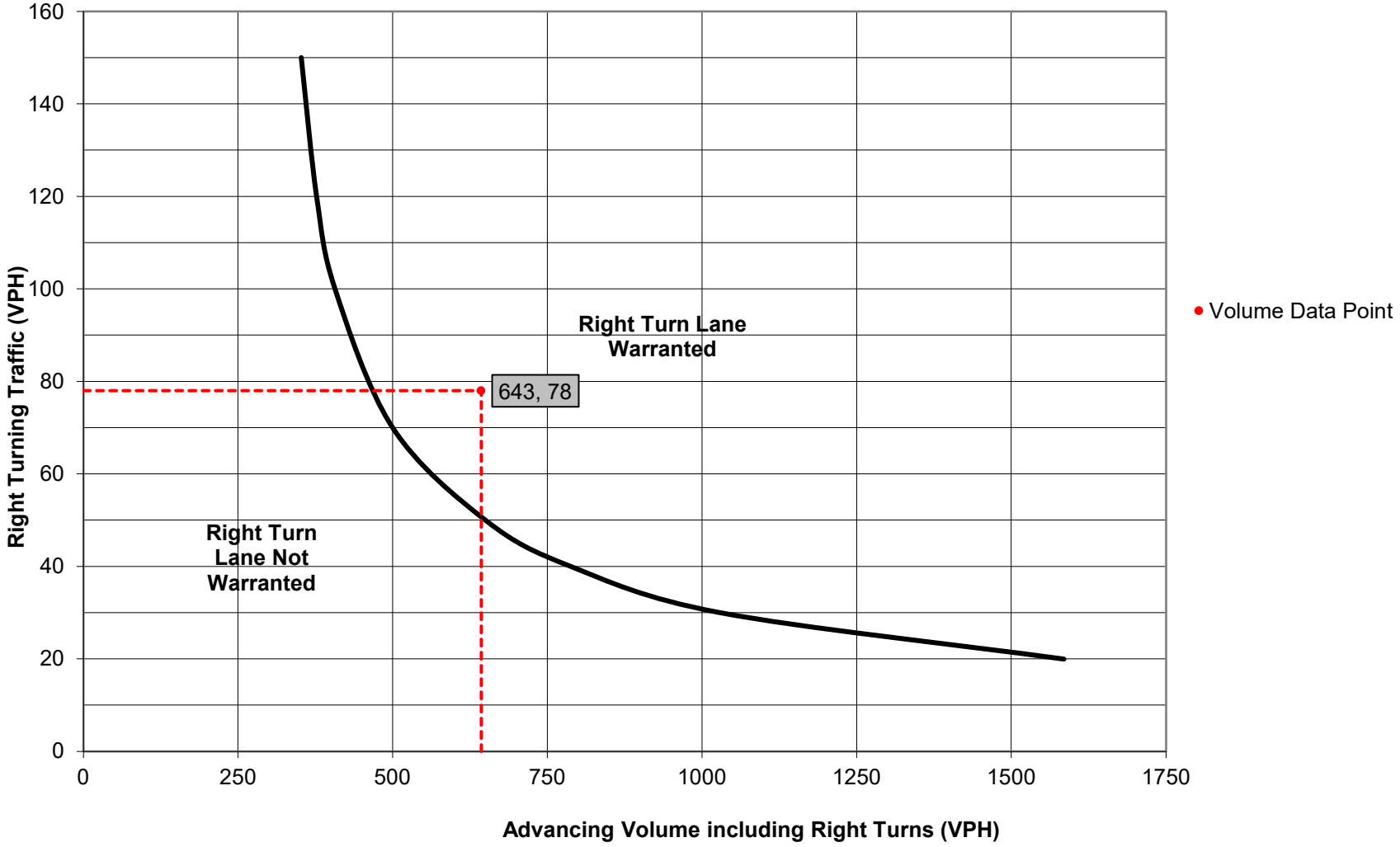



Figure 12. Warrant for right turn lanes on four-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)