January 15, 2026
TPD# WORT.00001

info@TPDinc.com

661 Penn Street Residential Development

Transportation Impact Assessment

Newtown Township, Bucks County, PA

For Submission To:
Newtown Township

Moving ***Forward*** **Together**®

661 PENN STREET RESIDENTIAL DEVELOPMENT
TRANSPORTATION IMPACT ASSESSMENT

FOR SUBMISSION TO:

Newtown Township, Bucks County, PA

Prepared For:
661 Penn St, LLC
Jim Worthington
120 Pheasant Run
Newtown, PA 18940

worthington@newtownathletic.com

January 15, 2026

TPD # WORT.00001

Prepared By:
Traffic Planning and Design, Inc.
2003 Lower State Road, Suite 122
Doylestown, PA 18901

Phone: (215) 622-2525
Fax: (215) 348-4824
E-mail: TPD@TPDinc.com
Website: www.TPDinc.com



Matthew I. Hammond, P.E.
Executive Vice President
Pennsylvania License Number 071037

TABLE OF CONTENTS

EXECUTIVE SUMMARY i
INTRODUCTION 1
EXISTING ROADWAY NETWORK 1
EXISTING TRAFFIC CONDITIONS 2
BASE (NO-BUILD) CONDITIONS 3
SCHEDULED ROADWAY IMPROVEMENTS 3
PROPOSED SITE ACCESS 3
TRIP GENERATION 5
TRIP DISTRIBUTION 6
PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES 7
LEVELS OF SERVICE FOR AN INTERSECTION 7
CAPACITY ANALYSIS METHODOLOGY 8
LEVELS OF SERVICE IN THE STUDY AREA 8
QUEUE ANALYSIS 9
AUXILIARY TURN LANE ANALYSIS 10
RECOMMENDATIONS AND CONCLUSIONS 10

FIGURES 1 – 6

TECHNICAL APPENDICES

Appendix A: Project Correspondence
Appendix B: Study Area Photographs
Appendix C: Traffic Count Printouts
Appendix D: Traffic Volume Development Data
Appendix E: Critical and Follow-up Headway Calculations
Appendix F: Capacity Analysis Worksheets
Appendix G: Auxiliary Turn Lane Warrant Analyses

EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed residential development on the roadway network in Newtown Township, Bucks County, PA. Based on this evaluation, the following conclusions were reached:

1. This report has been prepared in accordance with §22-402 of the Newtown Township Municipal Code.
2. The study area intersections included in this Transportation Impact Assessment (TIA) are listed below:
   - Washington Avenue & Newtown Commons West Driveway;
   - Penn Street & Existing Site Driveway.
3. The project site is currently occupied by a vacant ±52,800 square-foot (sf) office building and is situated between vacant land to the east, Newtown Cemetery to the west, Newtown Commons West to the north, and Penn Street to the south. TPD has been made aware that the proposed development is currently anticipated to consist of 308 apartments (versus the previously proposed 316 apartments). ***However, it should be noted that for the purposes of this analysis, TPD has utilized the trip generation for the previously proposed 316 apartments. As such, it is TPD's opinion that the results of this TIA yield a conservative estimate of the traffic impact on the study area roadway networks.***
4. The site property is currently served by one (1) full access driveway to Penn Street. An internal access roadway is proposed to be constructed between the site property and the Newtown Commons West property. The Newtown Commons West property is currently served by one (1) full access driveway to Washington Avenue.
5. Upon construction of the proposed residential development, the site will be served by two (2) existing access locations, as follows; one (1) to Washington Avenue and one (1) to Penn Street. No modifications to the external driveway accesses are proposed.
6. TPD has been made aware that the proposed development is currently anticipated to consist of 308 apartments (versus the previously proposed 316 apartments). Upon full build-out of the site when assuming the previously anticipated 316 apartments, the proposed development is expected to generate approximately **125 total vehicle-trips** during the weekday A.M. peak hour and **120 total vehicle-trips** during the weekday P.M. peak hour. ***However, it should be noted that if the existing vacant office building were re-occupied, it would generate approximately 79 total vehicle-trips during the weekday A.M. peak hour and 83 total vehicle-trips during the weekday P.M. peak hour.***

   Furthermore, it is TPD's opinion that the results of this TIA yield a conservative estimate of the traffic impact on the study area roadway networks.
7. The study area intersections will operate at **consistent overall intersection level of service (ILOS) between base and projected conditions** during the weekday A.M. and weekday P.M. peak hours.
8. All approaches and turning movements at the study area intersections will operate at **LOS D or better** under 2028 projected conditions during the weekday A.M. and weekday P.M. peak hours.
9. Traffic Planning and Design, Inc. (TPD) has made the following recommendations in relation to the proposed development in Newtown Township:

Washington Avenue & Newtown Commons West Driveway

» Realign the existing shared-use path on the eastbound Washington Avenue approach at the Newtown Commons West Driveway to align with a newly constructed crosswalk which will utilize the existing median in the Newtown Commons West Driveway approach as a pedestrian refuge.

» Construct a ±5-foot grass buffer between the realigned eastbound right-turn lane on Washington Avenue and the adjacent realigned shared-use path. It should be noted that there does not appear to be any buffer between the existing eastbound right-turn lane on Washington Avenue and the adjacent shared-use path.

Penn Street & Existing Site Driveway

» Construct new sidewalk along the site frontage on Penn Street in accordance with the Newtown Township code.

Internal Site Connection

» Construct a new internal roadway connecting the proposed site property and the existing Newtown Commons West property.

» Construct internal pedestrian walkways which will connect from Washington Avenue to Penn Street in accordance with the Newtown Township Code.

10. 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
LEVEL OF SERVICE (SECONDS) SUMMARY

Intersection	Movement (Existing / Proposed)	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Condition	Opening Year 2028		Existing Condition	Opening Year 2028	
			Base	Projected		Base	Projected
Washington Avenue & Newtown Commons West Driveway	EB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	EB R	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	WB L	A (9.6)	A (9.6)	A (9.7)	A (9.6)	A (9.6)	A (10.0)
	WB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	NB L	C (15.9)	C (15.9)	C (18.4)	C (22.3)	C (22.4)	D (28.7)
	NB R	A (0.0)	A (0.0)	B (10.5)	B (11.0)	B (11.0)	B (11.2)
	ILOS	**A (0.5)**	**A (0.5)**	**A (1.8)**	**A (1.3)**	**A (1.3)**	**A (2.3)**
Penn Street & Existing Site Driveway	EB LT	A (0.0)	A (0.0)	A (8.2)	A (0.0)	A (0.0)	A (8.3)
	WB TR	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB LR	A (0.0)	A (0.0)	A (8.5)	A (0.0)	A (0.0)	A (8.8)
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.9)**	**A (0.0)**	**A (0.0)**	**A (0.5)**

Base = No-Build scenario *Projected = Build scenario*
ILOS = Overall Intersection Level of Service
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.

11. 95th percentile queue lengths for the study area intersection have been summarized in matrix form. **Table II** details the 95th percentile queue lengths at the study area intersection.

TABLE II
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement (Existing / Proposed)	Storage (Existing / Proposed)	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Opening Year 2028		Opening Year 2028	
			Base	Projected	Base	Projected
Washington Avenue & Newtown Commons West Driveway	EB T	--	<25	<25	<25	<25
	EB R	75'	<25	<25	<25	<25
	WB L	150'	<25	<25	<25	<25
	WB T	--	<25	<25	<25	<25
	NB L	SITE	<25	<25	<25	28
	NB R	75'	<25	<25	<25	<25
Penn Street & Existing Site Driveway	EB LT	--	<25	<25	<25	<25
	WB TR	--	<25	<25	<25	<25
	SB LR	SITE	<25	<25	<25	<25

INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Assessment (TIA) for the proposed residential development in Newtown Township, Bucks County, Pennsylvania. The project site is currently occupied by a vacant ±52,800 square-foot (sf) office building and is situated between vacant land to the east, Newtown Cemetery to the west, Newtown Commons West to the north, and Penn Street to the south, as shown in **Figure 1**. As shown in **Figure 2**, the proposed development will consist of 308 apartments (versus the previously proposed 316 apartments). ***However, it should be noted that for the purposes of this analysis, TPD has utilized the trip generation for the previously proposed 316 apartments. As such, it is TPD's opinion that the results of this TIA yield a conservative estimate of the traffic impact on the study area roadway networks.***

This report has been prepared in accordance with §22-402 of the Newtown Township Municipal Code. All relevant correspondence pertaining to this project has been included in **Appendix A**.

Site Access Locations

The site property is currently served by one (1) full access driveway to Penn Street. An internal access roadway is proposed to be constructed between the site property and the Newtown Commons West property. The Newtown Commons West property is currently served by one (1) full access driveway to Washington Avenue.

Upon construction of the proposed residential development, the site will be served by two (2) existing access locations, as follows; one (1) to Washington Avenue and one (1) to Penn Street. No modifications to the external driveways are proposed.

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[1]	Posted Speed Limit
Washington Avenue	Township	Minor Arterial	East-West	10,341	25 mph
Penn Street	Township	Local	East-West[2]	N/A	25 mph

1 = AADT Data from PennDOT Traffic Information Repository (TIRe) website (Accessed October 2025)
2 = Penn Street is situated in an east-west orientation in the study area

Land Use Context

In Section 1.1 of the Design Manual, Part 2, Contextual Roadway Design, there is guidance pertaining to defining the land use context(s) for a given area. Based upon review of this information, the land uses surrounding the proposed site best fits the Suburban designation, as described below:

***Suburban**, areas with low to medium density (where single-family structures predominate, along with some*

multi-family and multistory commercial structures); mixed residential neighborhood and commercial clusters (including town centers, commercial corridors, big box commercial, and light industrial); and varied setbacks with some sidewalks and mostly off-street parking.

Roadway Type

In Section 1.2.1 of the Design Manual, Part 2, Contextual Roadway Design, there is guidance pertaining to defining the transportation context(s) for a given area. Comparing the existing condition roadway characteristics to the various options presented in Table 1.2, the study area roadways best fit the following categories, as described below:

Minor Arterial, corridors of regional or community importance connecting centers of activity.

- Washington Avenue.

Local, roadways with no regional importance, providing local circulation and access. Local roadway type refers to the function of the road, not the ownership. For example, a collector might be locally owned but that does not make it a local roadway.

- Penn Street.

Bicycle and Pedestrian Facilities

Based on observations during field visits at the study area intersections, there is an existing sidewalk on the northern side of Washington Avenue and a shared-use path on the southern side of Washington Avenue, adjacent to the Newtown Commons West property. Additionally, there is an existing sidewalk on the southern side of Penn Street, opposite the proposed development site. Paved shoulders and/or travel lanes currently accommodate bicycle traffic in the vicinity of the proposed development.

Sidewalk is proposed to be constructed on the site frontage along Penn Street, which will be connected via internal sidewalks to Washington Avenue. Additionally, the shared-use path at the Washington Avenue/Newtown Commons West Driveway will be realigned to provide a ±5-foot grass buffer along the eastbound right-turn lane on Washington Avenue and utilize the existing median on the Newtown Commons West Driveway approach as a pedestrian refuge.

Mass Transit Facilities

Bucks County is provided with public transportation by the Southeastern Pennsylvania Transportation Authority (SEPTA). Public transportation is available in Newtown Township and Newtown Borough via SEPTA Bus Route 130. The nearest bus stop is located at Terry Drive & Pheasant Run in Newtown Township, ±0.35 miles east of the proposed development. However, it should be noted that this bus stop is provided with limited weekday service only. The nearest bus stop provided with full-time service is located at Lincoln Avenue & Penn Street in Newtown Borough, ±0.50 miles west of the proposed development. Additionally, no rail service is available within one (1) mile of the proposed development.

EXISTING TRAFFIC CONDITIONS

Intersection Turning Movement Counts

Intersection turning movement counts were conducted on 15-minute intervals during the weekday morning (7:00 to 9:00 A.M.) and weekday evening (4:00 to 6:00 P.M.) peak periods. Data pertaining to heavy vehicles,

pedestrians and transit vehicles were also recorded. Peak hours and count dates for the study area intersections are identified in **Table 2**.

TABLE 2
TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour[1]
Washington Avenue & Newtown Commons West Driveway	Tuesday, October 14, 2025	Weekday A.M.	8:00 to 9:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
Penn Street & Existing Site Driveway	Tuesday, October 14, 2025	Weekday A.M.	8:00 to 9:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.

1 = 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. and weekday P.M. peak hours are illustrated in **Figure 3**. Manual 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 2025 to July 2026 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.08% per year in Bucks County for urban non-interstate roadways. As such, the background growth factor was applied annually to yield overall growth percentages of 0.24% (0.08% per year, compounded over three (3) years) for the 2028 opening year.

Nearby Proposed Developments

Base (no-build) traffic conditions traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the 2028 opening year. No nearby planned developments were identified to be included in this study.

Base (No-Build) Conditions Volume Development

The additional traffic volumes due to background growth were added to the existing traffic volumes to produce 2028 base (no-build) condition traffic volumes. The 2028 base condition traffic volumes for the weekday A.M. and weekday P.M. peak hours are illustrated in **Figure 4**.

SCHEDULED ROADWAY IMPROVEMENTS

Programmed Improvements

Based on a review of the Pennsylvania Statewide Transportation Improvement Program (STIP), there are no programmed roadway improvements within the study area.

PROPOSED SITE ACCESS

The site property is currently served by one (1) full access driveway to Penn Street. An internal access roadway is proposed to be constructed between the site property and the Newtown Commons West

property. The Newtown Commons West property is currently served by one (1) full access driveway to Washington Avenue.

Upon construction of the proposed residential development, the site will be served by two (2) existing access locations, as follows; one (1) to Washington Avenue and one (1) to Penn Street. No modifications to the external driveway accesses are proposed.

PennDOT 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:

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

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 3 shows the measured, desirable, acceptable (SSSD), and required sight distances at the existing Newtown Commons West Driveway to Washington Avenue for vehicles entering and exiting the site.

TABLE 3
SIGHT DISTANCE ANALYSIS
EXISTING NEWTOWN COMMONS WEST DRIVEWAY TO WASHINGTON AVENUE

	Direction	Speed	Grade[1]	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	25 mph	-1%	250	148	**450+**
	To the right	25 mph	+1%	195	145	**450+**
Entering Left Turns	Approaching same direction	25 mph	+1%	--	145	**450+**
	Approaching opposite direction	25 mph	-1%	190	148	**450+**

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance
1 = Roadway Grade Approaching Driveway
EXIST = Existing (measured) Sight Distance

As shown in **Table 3** above, the measured sight distances at the site driveway exceed PennDOT's desirable sight distance requirements.

Table 4 shows the measured, desirable, acceptable (SSSD), and required sight distances at the Existing Site Driveway to Penn Street for vehicles entering and exiting the site.

TABLE 4
SIGHT DISTANCE ANALYSIS
EXISTING SITE DRIVEWAY TO PENN STREET

	Direction	Speed	Grade[1]	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	25 mph	0%	250	147	**450+**
	To the right	25 mph	-1%	195	148	**450+**
Entering Left Turns	Approaching same direction	25 mph	-1%	--	148	**450+**
	Approaching opposite direction	25 mph	0%	190	147	**450+**

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance
1 = Roadway Grade Approaching Driveway
EXIST = Existing (measured) Sight Distance

As shown in **Table 4** above, the measured sight distances at the site driveway exceed PennDOT's desirable sight distance requirements.

TRIP GENERATION

Trip generation rates were obtained from the *Trip Generation* Manual, Twelfth Edition, 2025, an Institute of Transportation Engineers (ITE) Informational Report. The data are categorized by Land Use Codes, with total vehicular trips for a given land use estimated using an independent variable and statistically generated rates or equations.

For the proposed development, Land Use Code 221 (Multifamily Housing (Mid-Rise)) from *Trip Generation* was used to calculate the number of vehicular trips the development will generate during the following time periods: (1) average weekday; (2) weekday A.M. peak hour; and (3) weekday P.M. peak hour. **Table 5** shows the rates/equations and directional percentages for the analyzed time periods.

TABLE 5
ITE TRIP GENERATION DATA

Land Use	ITE #	Time Period	Equations/Rates	Entering %	Exiting %
Multifamily Housing (Mid-Rise)	221	Average Weekday	T = 4.55(X) – 17.52	50%	50%
		Weekday A.M. Peak Hour	T = 0.42(X) – 7.77	23%	77%
		Weekday P.M. Peak Hour	T = 0.38(X)	64%	36%

T = number of site-generated vehicular trips
X = independent variable (dwelling units)

Table 6 summarizes the trip generation of each land use for the analyzed time periods.

TABLE 6
TRIP GENERATION SUMMARY

Land Use (ITE #)	Time Period	Site Trips		
		Total	Enter	Exit
Multifamily Housing (Mid-Rise) (#221)	Average Weekday	1,420	710	710
	Weekday A.M. Peak Hour	125	29	96
	Weekday P.M. Peak Hour	120	77	43

TPD has been made aware that the proposed development is currently anticipated to consist of 308 apartments (versus the previously proposed 316 apartments). Upon full build-out of the site when assuming the previously anticipated 316 apartments, the proposed development is expected to generate approximately **125 total vehicle-trips** during the weekday A.M. peak hour and **120 total vehicle-trips** during the weekday P.M. peak hour. ***However, it should be noted that if the existing vacant office building were re-occupied, it would generate approximately 79 total vehicle-trips during the weekday A.M. peak hour and 83 total vehicle-trips during the weekday P.M. peak hour.***

Furthermore, it is TPD's opinion that the results of this TIA yield a conservative estimate of the traffic impact on the study area roadway networks.

TRIP DISTRIBUTION

Internal Site Connection

An internal access roadway is proposed to be constructed between the site property and the Newtown Commons West property in conjunction with the proposed development. It is noted that all existing traffic traveling to/from Newtown Commons West currently utilizes the existing driveway on Washington Avenue. Upon construction of the internal connection, all vehicles which travel to/from the Newtown Commons West property will be able to access the site driveway on Penn Street via the internal access roadway.

However, based on the existing traffic patterns and existing roadway network in the vicinity of the site and the existing building locations within the existing Newtown Commons West property, TPD did not redistribute any of the existing traffic which utilizes the Newtown Commons West Driveway on Washington Avenue for the purposes of this analysis.

New Trips

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	Assignment (To/From)	Distribution %
East	Washington Avenue	44%
	Penn Street	6%
West	Washington Avenue	44%
	Penn Street	6%

The assignment of site-generated trips for the proposed development during the weekday A.M. and weekday P.M. peak hours are shown in **Figure 5**. The trip distribution and assignment percentage information are included in **Appendix D**.

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2028 base (no-build) condition traffic volumes to develop 2028 projected (build) condition traffic volumes.

Projected condition traffic volumes for the opening year of 2028 for the weekday A.M. and weekday P.M. peak hours are shown in **Figure 6**. Traffic volume development worksheets are contained in **Appendix D**.

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 8**. 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 8
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. and weekday P.M. 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;
- 2028 Base conditions (Build-out year without development);
- 2028 Projected conditions (Build-out year with development).

The following items should be noted with respect to the capacity analyses:

- The Pennsylvania default values for two-way stop-controlled intersections in a Suburban land use context contained in Chapter 10 of PennDOT's *Publication 46* were utilized for the base critical headway and base follow-up headways. The critical and follow-up headway calculation worksheets are included in **Appendix E**.
- The peak hour factors observed at the existing study area intersections during the turning movement counts for each peak hour analyzed were utilized for the analyses.
- It should be noted that no heavy vehicles were recorded for any turning movements to/from the Newtown Commons West Driveway on Washington Avenue and the Existing Site Driveway on Penn Street. As such, a heavy vehicle percentage of 0% was utilized for all turning movements to/from these driveways under existing and base (no-build) conditions.
- Per PennDOT standards, a heavy vehicle percentage of 2% was utilized for all turning movements to/from the proposed site driveways under projected (build) conditions.

The capacity analysis worksheets are included in **Appendix F**.

LEVELS OF SERVICE IN THE STUDY AREA

Level of service (LOS) matrices for the study area intersections are shown in **Table 9** for the weekday A.M. and weekday P.M. peak hours.

TABLE 9
LEVEL OF SERVICE (SECONDS) SUMMARY

Intersection	Movement (Existing / Proposed)	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Condition	Opening Year 2028		Existing Condition	Opening Year 2028	
			Base	Projected		Base	Projected
Washington Avenue & Newtown Commons West Driveway	EB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	EB R	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	WB L	A (9.6)	A (9.6)	A (9.7)	A (9.6)	A (9.6)	A (10.0)
	WB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	NB L	C (15.9)	C (15.9)	C (18.4)	C (22.3)	C (22.4)	D (28.7)
	NB R	A (0.0)	A (0.0)	B (10.5)	B (11.0)	B (11.0)	B (11.2)
	ILOS	**A (0.5)**	**A (0.5)**	**A (1.8)**	**A (1.3)**	**A (1.3)**	**A (2.3)**
Penn Street & Existing Site Driveway	EB LT	A (0.0)	A (0.0)	A (8.2)	A (0.0)	A (0.0)	A (8.3)
	WB TR	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB LR	A (0.0)	A (0.0)	A (8.5)	A (0.0)	A (0.0)	A (8.8)
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.9)**	**A (0.0)**	**A (0.0)**	**A (0.5)**

Base = No-Build scenario *Projected = Build scenario*
ILOS = Overall Intersection Level of Service
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.

As shown in **Table 9**, the study area intersections will operate at **consistent overall intersection level of service (ILOS) between base and projected conditions** during the weekday A.M. and weekday P.M. peak hours.

As shown in **Table 9**, all approaches and turning movements at the study area intersections will operate at **LOS D or better** under 2028 projected conditions during the weekday A.M. and weekday P.M. peak hours.

QUEUE ANALYSIS

Queue analyses were conducted at the study area intersections using *Synchro 12* software. The queue analysis results are summarized in **Table 10** for the analyzed peak hours.

TABLE 10
95TH PERCENTILE QUEUE ANALYSIS (FEET)

Intersection	Movement (Existing / Proposed)	Storage (Existing / Proposed)	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Opening Year 2028		Opening Year 2028	
			Base	Projected	Base	Projected
Washington Avenue & Newtown Commons West Driveway	EB T	--	<25	<25	<25	<25
	EB R	75'	<25	<25	<25	<25
	WB L	150'	<25	<25	<25	<25
	WB T	--	<25	<25	<25	<25
	NB L	SITE	<25	<25	<25	28
	NB R	75'	<25	<25	<25	<25
Penn Street & Existing Site Driveway	EB LT	--	<25	<25	<25	<25
	WB TR	--	<25	<25	<25	<25
	SB LR	SITE	<25	<25	<25	<25

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

AUXILIARY TURN LANE ANALYSIS

Methodology

TPD evaluated auxiliary turn lane warrants at the site access intersections. 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 11 summarizes the results of the auxiliary turn lane analysis at the site access intersection.

TABLE 11
AUXILIARY TURN LANE ANALYSIS SUMMARY

Intersection	Auxiliary Lane	Warrant Satisfied?		Required Lane Length	Existing Lane Length	Proposed Lane Length
		A.M.	P.M.			
Washington Avenue & Newtown Commons West Driveway	WB Left-Turn Lane	Yes	Yes	75'	150'	No Change
	EB Right-Turn Lane	No	No	--	75'	No Change
Penn Street & Existing Site Driveway	EB Left-Turn Lane	No	No	--	--	--
	WB Right-Turn Lane	No	No	--	--	--

Based on the criteria outlined above as shown in **Table 11**, under 2028 projected conditions, the following is a summary of the auxiliary turn lane warrants analysis.

Washington Avenue & Newtown Commons West Driveway

The left-turn lane warrants are satisfied for a 75-foot left-turn lane on westbound Washington Avenue for vehicles entering the site via a left-turn movement at the Newtown Commons West Driveway. It should be noted that a 150-foot westbound left-turn lane on Washington Avenue currently exists and exceeds the required lane lengths. As such, the existing 150-foot westbound left-turn lane will remain upon construction of the proposed development.

In addition, the right-turn lane warrants are not satisfied for movements into the site via eastbound Washington Avenue at the Newtown Commons West Driveway. However, it should be noted that a 75-foot eastbound right-turn lane on Washington Avenue currently exists. As such, the existing 75-foot eastbound right-turn lane will remain upon construction of the proposed development.

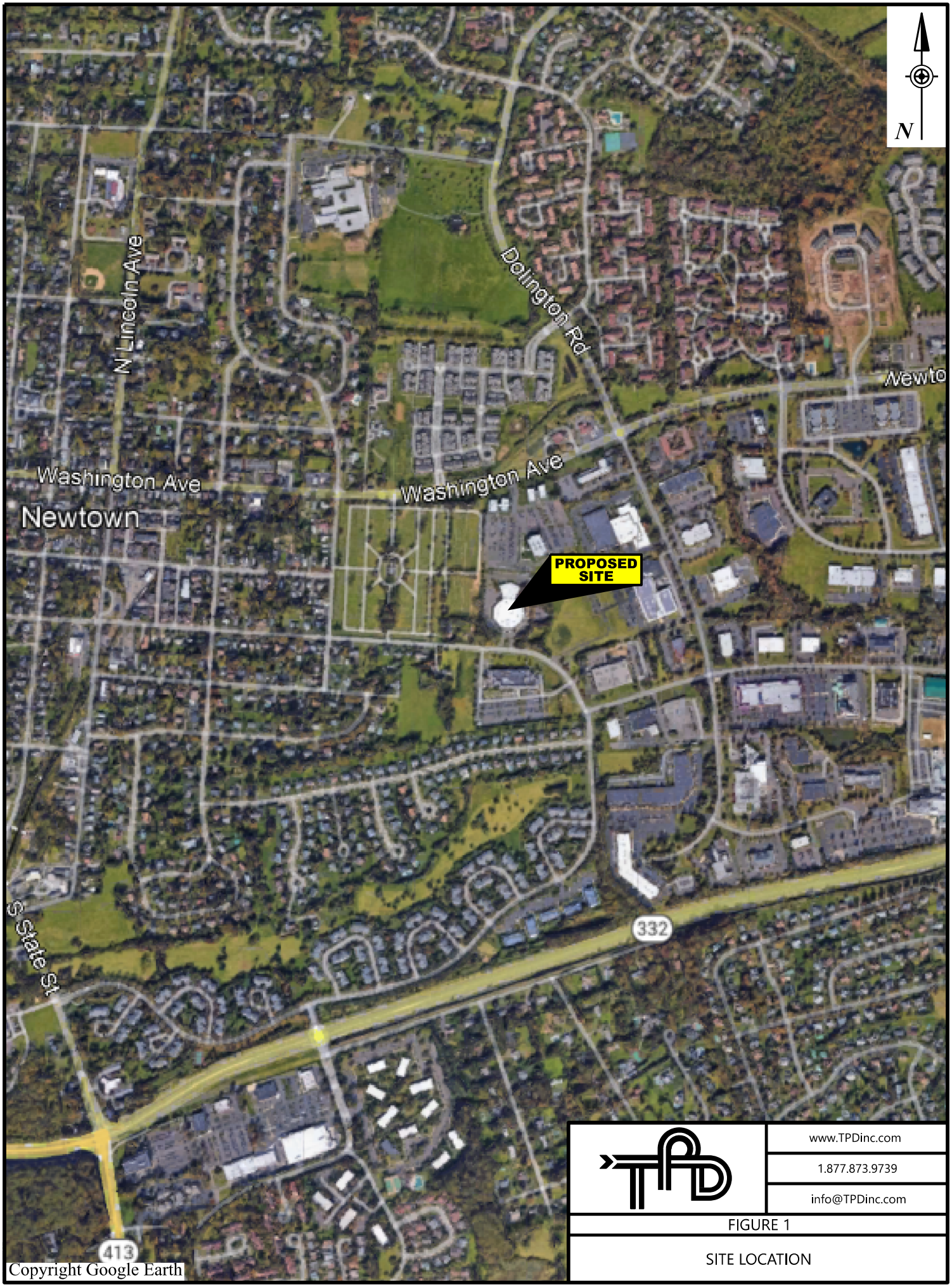
Penn Street & Existing Site Driveway

Left-turn lane and right-turn lane warrants are not satisfied on Penn Street at the Existing Site Driveway.

Auxiliary turn lane warrant analysis worksheets are included in **Appendix G**.

RECOMMENDATIONS AND CONCLUSIONS

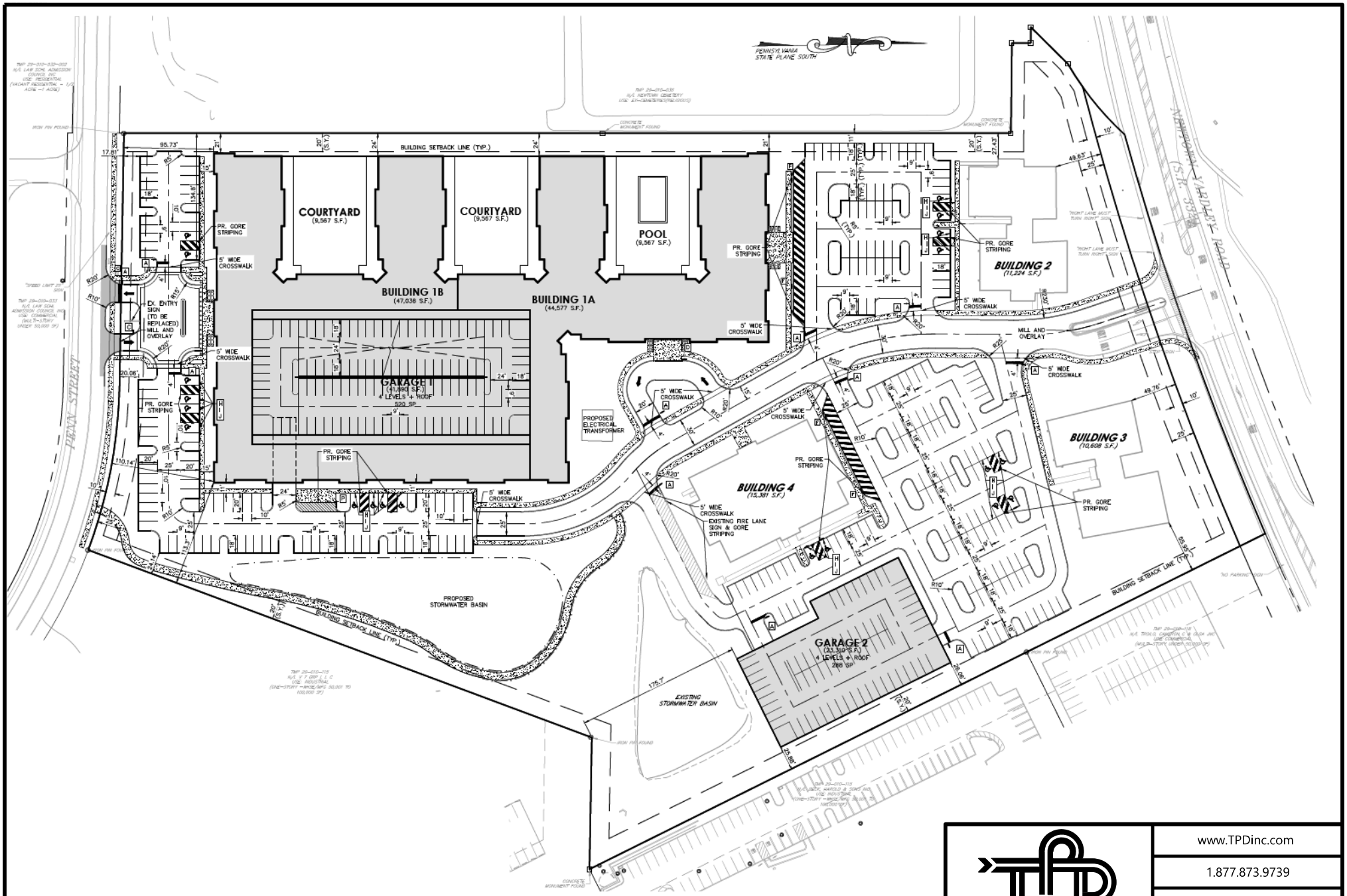
The recommendations and conclusions of this Transportation Impact Assessment (TIA) are identified in the Executive Summary.



	www.TPDinc.com
	1.877.873.9739
	info@TPDinc.com

FIGURE 1

SITE LOCATION



KEY:
SCHEMATIC DRAWING:NOT TO SCALE

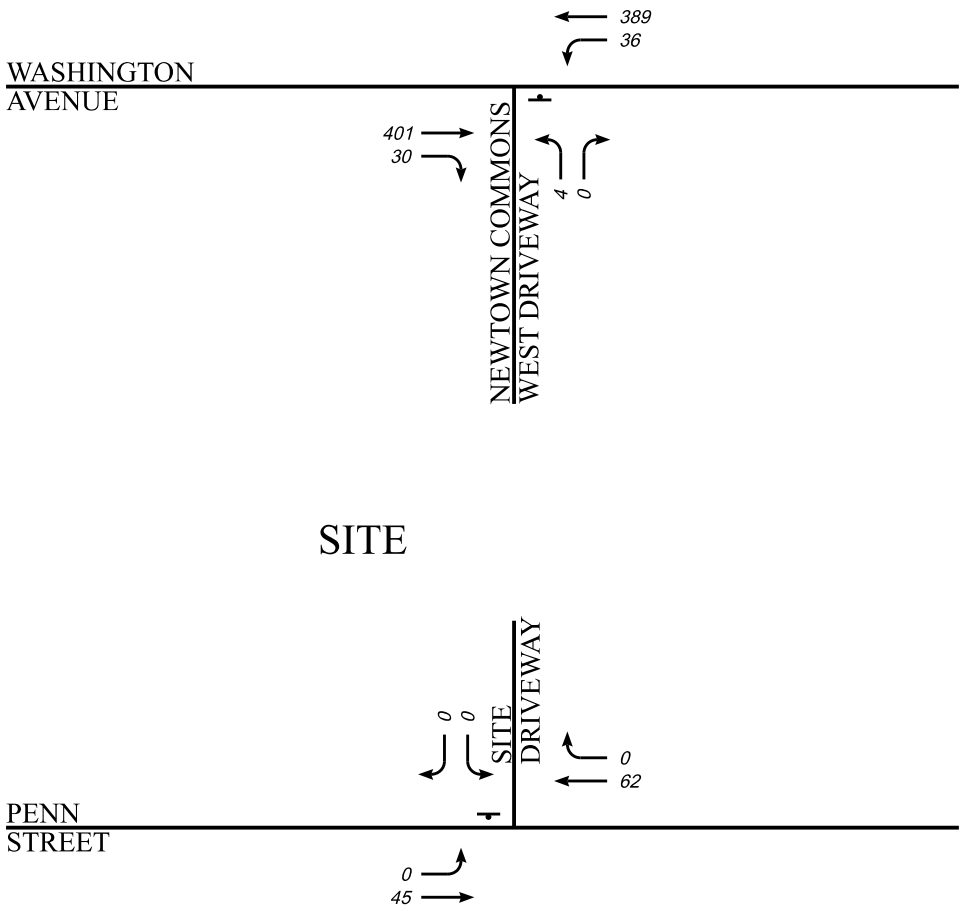
GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
CORPORATE HEADQUARTERS
85 EAST BUTLER AVENUE, SUITE 100, NEW BRITAIN, PA 18901 • (215) 345-4330 • www.gilmore-assoc.com

www.TPDinc.com
1.877.873.9739
info@TPDinc.com

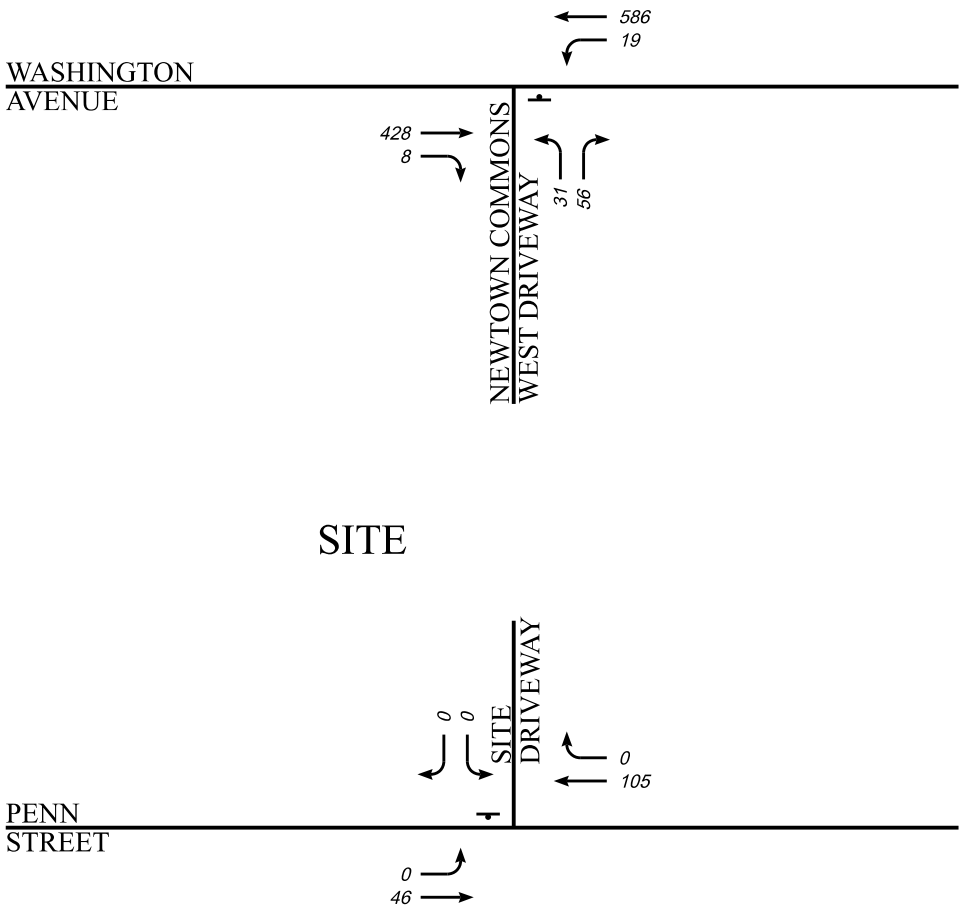
FIGURE 2

SITE PLAN

WEEKDAY A.M. PEAK HOUR



WEEKDAY P.M. PEAK HOUR



KEY:

STOP CONTROLLED

SCHEMATIC DRAWING:NOT TO SCALE

N

www.TPDinc.com

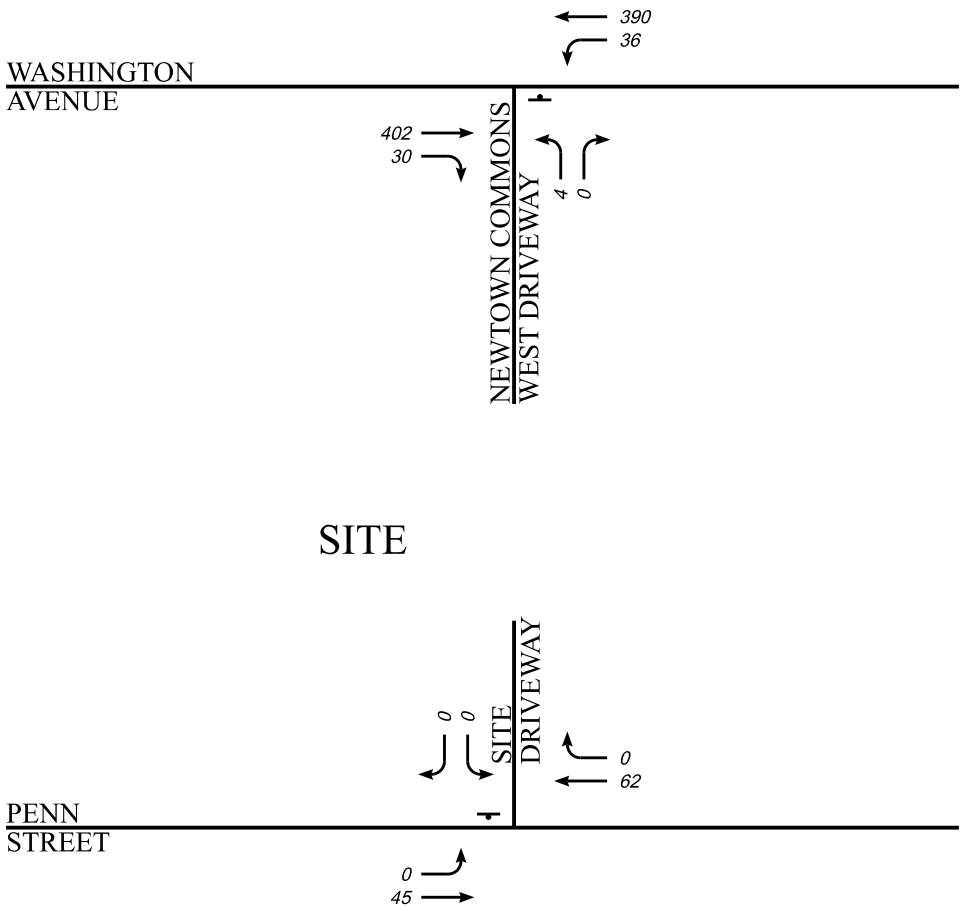
1.877.873.9739

info@TPDinc.com

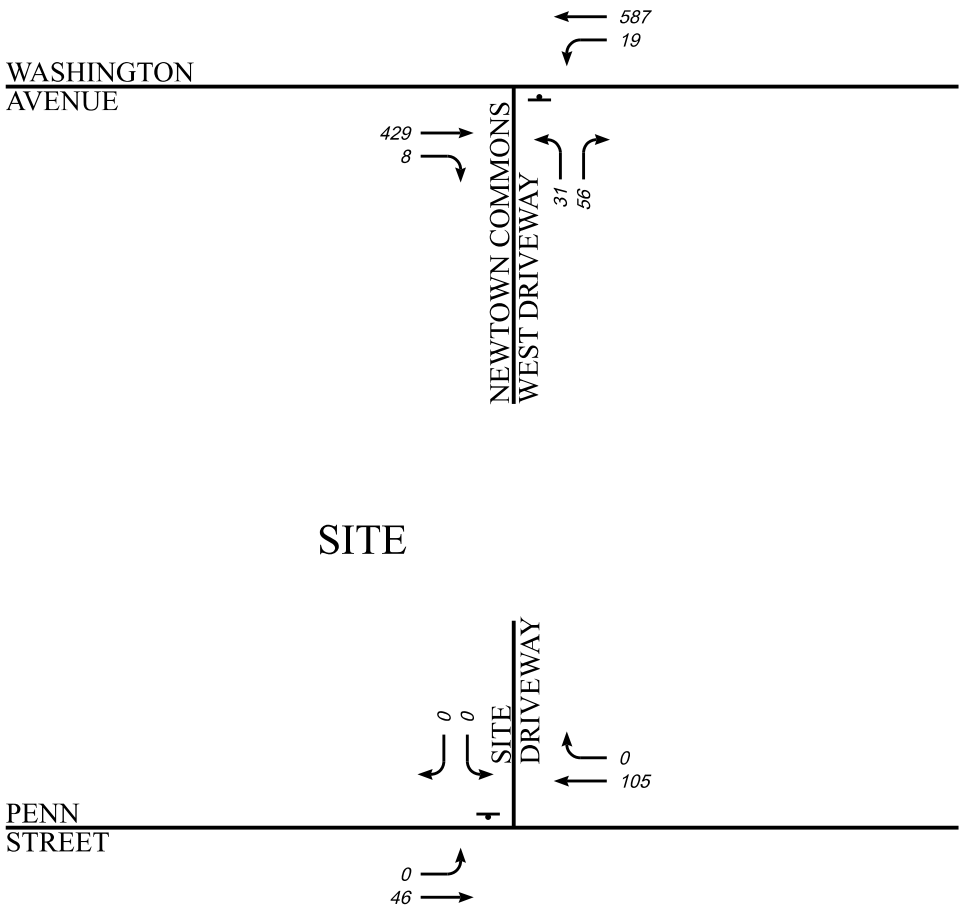
FIGURE 3

EXISTING CONDITIONS
WEEKDAY PEAK HOUR
TRAFFIC VOLUMES

WEEKDAY A.M. PEAK HOUR



WEEKDAY P.M. PEAK HOUR



KEY:

—•— **STOP CONTROLLED**

SCHEMATIC DRAWING:NOT TO SCALE

N

www.TPDinc.com

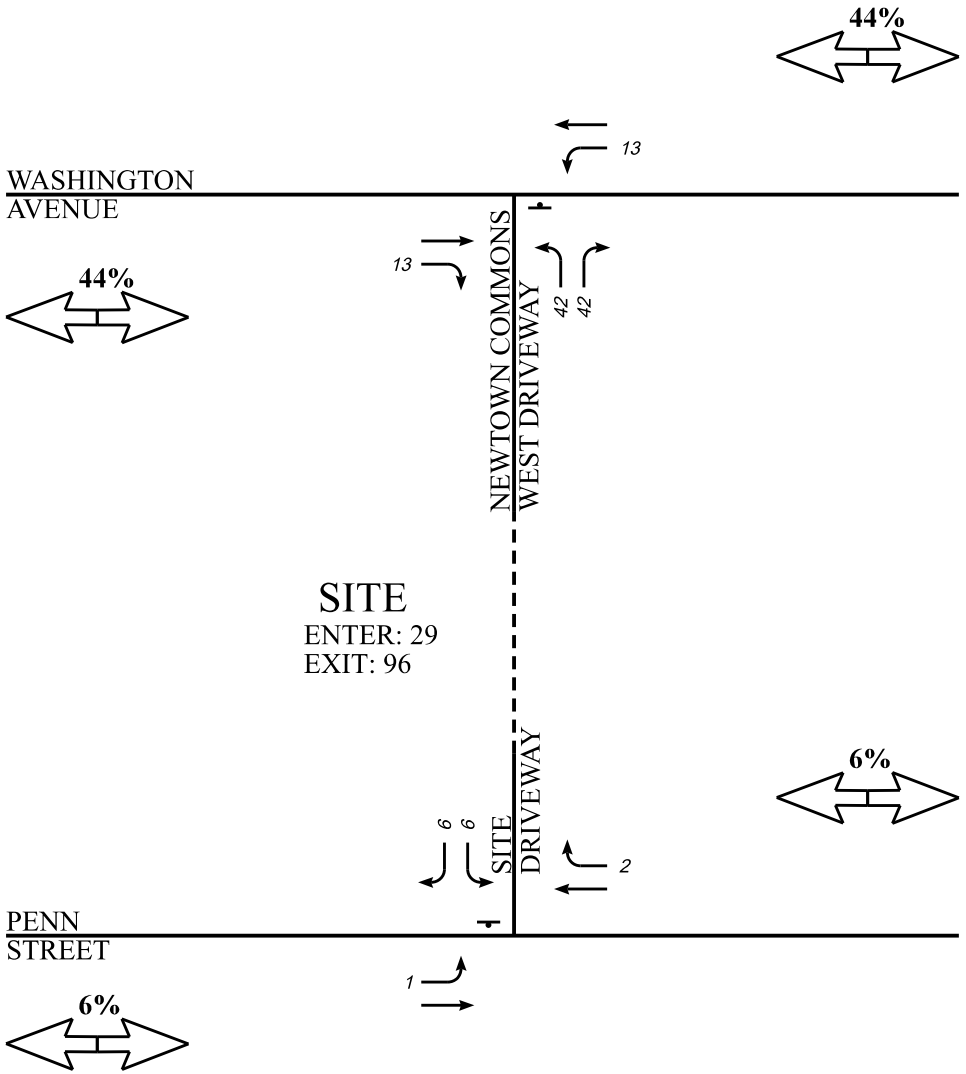
1.877.873.9739

info@TPDinc.com

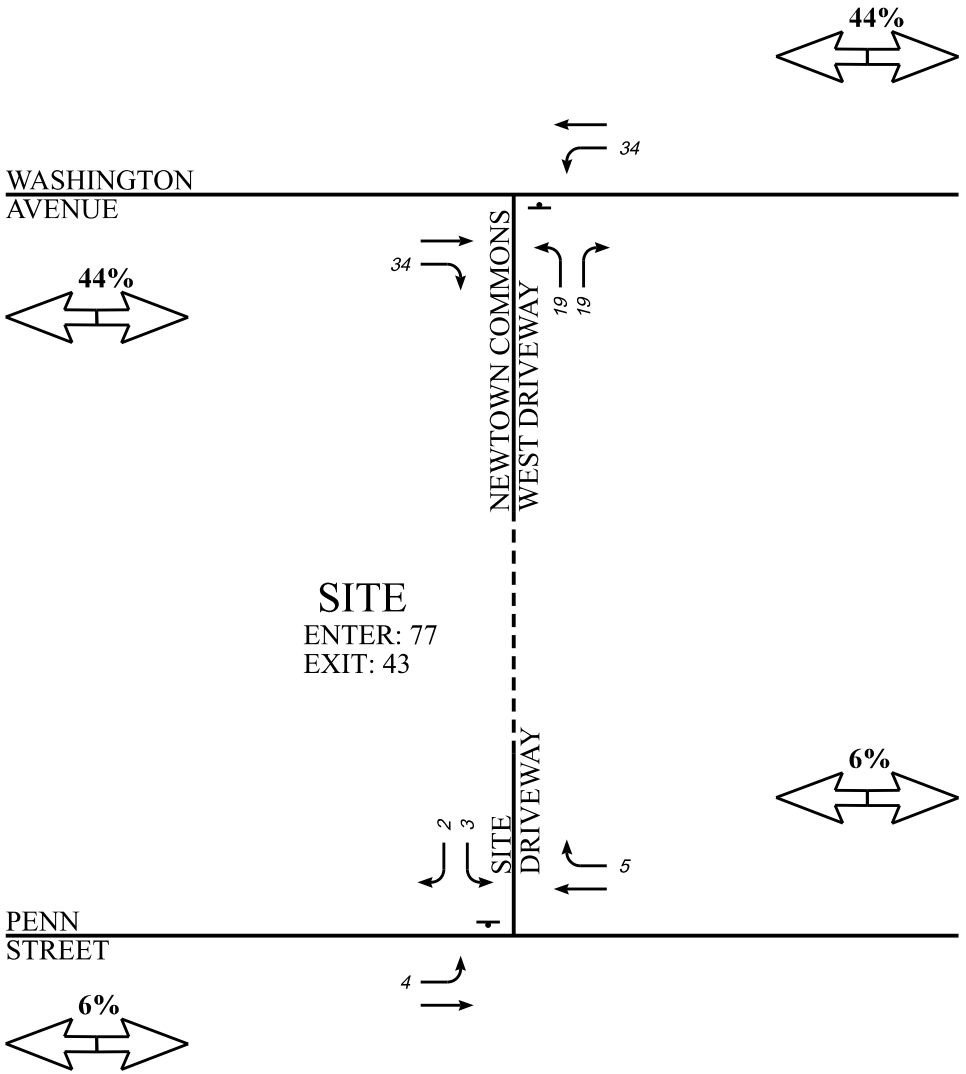
FIGURE 4

2028 BASE (NO-BUILD) CONDITIONS
WEEKDAY PEAK HOUR
TRAFFIC VOLUMES

WEEKDAY A.M. PEAK HOUR



WEEKDAY P.M. PEAK HOUR



KEY:

STOP CONTROLLED

SCHEMATIC DRAWING:NOT TO SCALE

<--> = NEW TRIP PERCENTAGES

- - - - - = PROPOSED INTERNAL CONNECTION

N

www.TPDinc.com

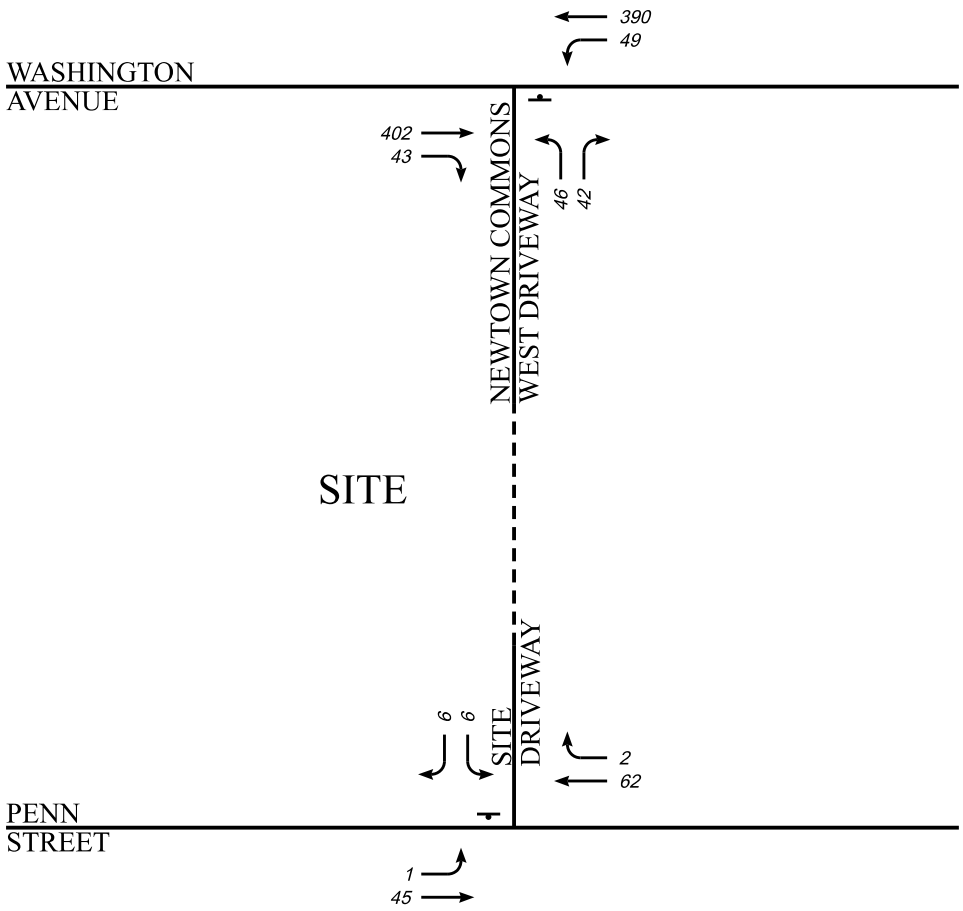
1.877.873.9739

info@TPDinc.com

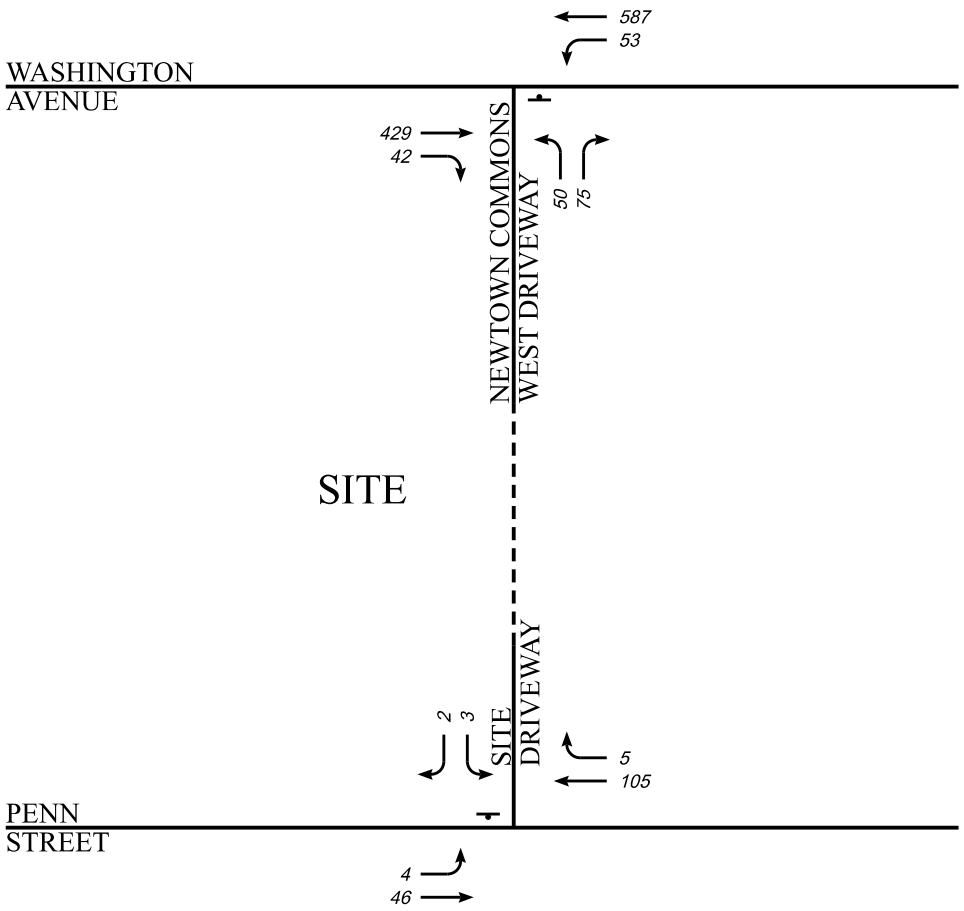
FIGURE 5

SITE TRIPS
WEEKDAY PEAK HOUR
TRIP DISTRIBUTION

WEEKDAY A.M. PEAK HOUR



WEEKDAY P.M. PEAK HOUR



KEY:

STOP CONTROLLED

SCHEMATIC DRAWING:NOT TO SCALE

- - - - - = PROPOSED INTERNAL CONNECTION

N

www.TPDinc.com

1.877.873.9739

info@TPDinc.com

FIGURE 6

2028 PROJECTED (BUILD) CONDITIONS
WEEKDAY PEAK HOUR
TRAFFIC VOLUMES

APPENDIX A:
Project Correspondence

This Appendix is reserved for future correspondence

APPENDIX B:
Study Area Photographs

Job #: *WORT.00001* *Date Taken:* *10-15-2025* *Intersection Of:* *Newtown Commons West Driveway & Washington Ave*



Direction / Road: **Nb.** ***Newtown Commons West Driveway***
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: **Nb.** ***Newtown Commons West Driveway***
Approach / Departure: Approach
Distance: 200 Feet

Job #: *WORT.00001* *Date Taken:* *10-15-2025* *Intersection Of:* *Newtown Commons West Driveway & Washington Ave*



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



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

Job #: *WORT.00001* *Date Taken:* *10-15-2025* *Intersection Of:* *Newtown Commons West Driveway & Washington Ave*



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



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

Job #: *WORT.00001* *Date Taken:* *10-15-2025* *Intersection Of:* *Existing Site Driveway & Penn Street*



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



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

Job #: *WORT.00001* *Date Taken:* *10-15-2025* *Intersection Of:* *Existing Site Driveway & Penn Street*



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



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

Job #: *WORT.00001* *Date Taken:* *10-15-2025* *Intersection Of:* *Existing Site Driveway & Penn Street*



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



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

APPENDIX C:
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 Newtown Commons West Driveway & Washington Avenue
Site Code:
Start Date: 10/14/2025

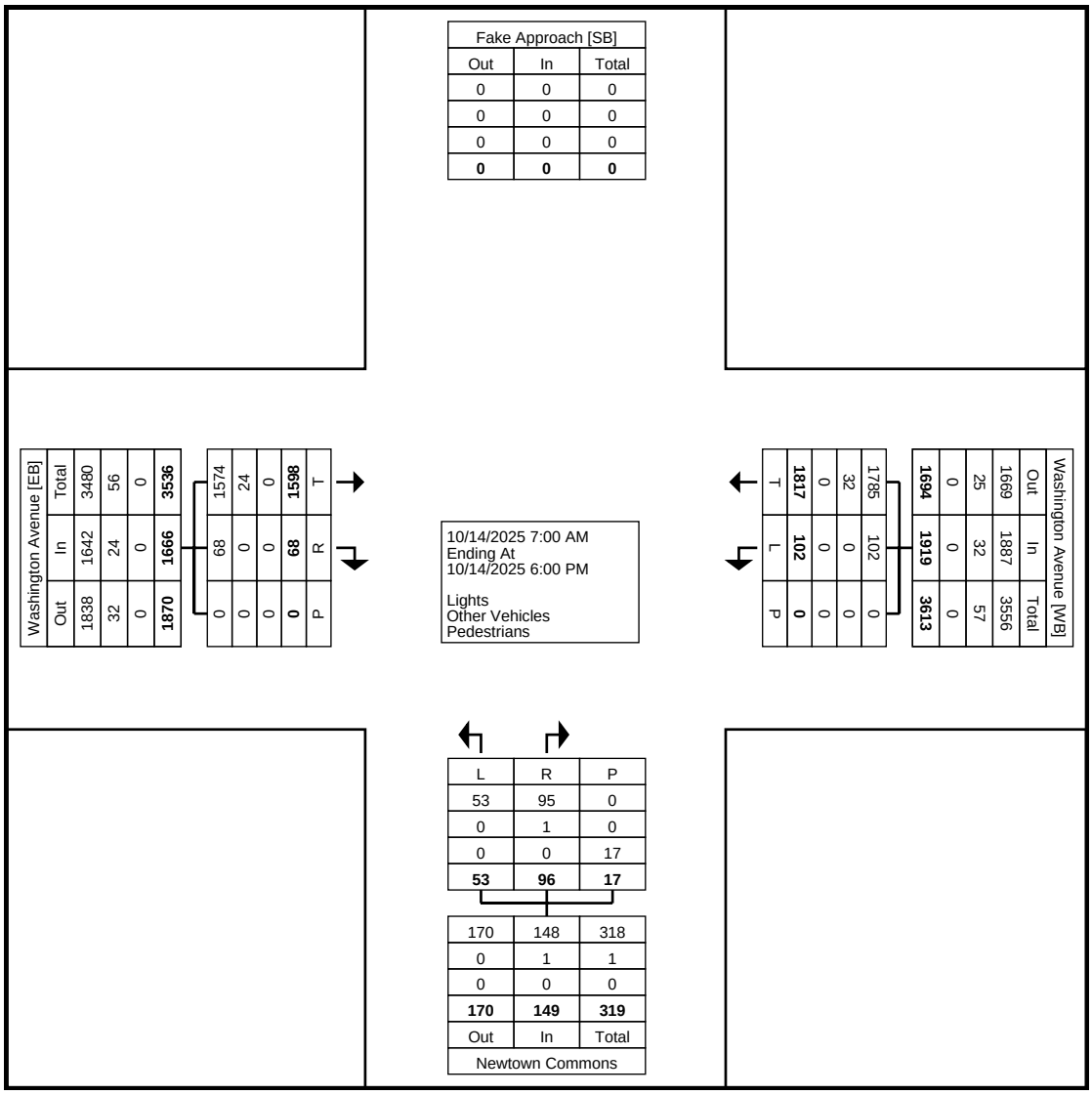
Turning Movement Data

Start Time	Washington Avenue Eastbound				Washington Avenue Westbound				Newtown Commons Driveway Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	68	2	0	70	3	77	0	80	0	2	1	2	152
7:15 AM	91	1	0	92	5	62	0	67	0	0	1	0	159
7:30 AM	110	6	0	116	6	67	0	73	0	1	1	1	190
7:45 AM	103	9	0	112	15	98	0	113	0	1	1	1	226
Hourly Total	372	18	0	390	29	304	0	333	0	4	4	4	727
8:00 AM	117	8	0	125	7	84	0	91	0	0	1	0	216
8:15 AM	102	10	0	112	7	91	0	98	0	0	0	0	210
8:30 AM	89	8	0	97	9	92	0	101	2	0	2	2	200
8:45 AM	93	4	0	97	13	122	0	135	2	0	3	2	234
Hourly Total	401	30	0	431	36	389	0	425	4	0	6	4	860
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	111	3	0	114	8	131	0	139	9	14	2	23	276
4:15 PM	111	2	0	113	1	151	0	152	5	10	0	15	280
4:30 PM	96	4	0	100	8	133	0	141	6	17	0	23	264
4:45 PM	112	1	0	113	5	130	0	135	8	7	0	15	263
Hourly Total	430	10	0	440	22	545	0	567	28	48	2	76	1083
5:00 PM	109	1	0	110	5	172	0	177	12	22	2	34	321
5:15 PM	86	3	0	89	1	126	0	127	5	6	0	11	227
5:30 PM	119	4	0	123	6	147	0	153	2	8	2	10	286
5:45 PM	81	2	0	83	3	134	0	137	2	8	1	10	230
Hourly Total	395	10	0	405	15	579	0	594	21	44	5	65	1064
Grand Total	1598	68	0	1666	102	1817	0	1919	53	96	17	149	3734
Approach %	95.9	4.1	-	-	5.3	94.7	-	-	35.6	64.4	-	-	-
Total %	42.8	1.8	-	44.6	2.7	48.7	-	51.4	1.4	2.6	-	4.0	-
Lights	1574	68	-	1642	102	1785	-	1887	53	95	-	148	3677
% Lights	98.5	100.0	-	98.6	100.0	98.2	-	98.3	100.0	99.0	-	99.3	98.5
Other Vehicles	24	0	-	24	0	32	-	32	0	1	-	1	57
% Other Vehicles	1.5	0.0	-	1.4	0.0	1.8	-	1.7	0.0	1.0	-	0.7	1.5
Pedestrians	-	-	0	-	-	-	0	-	-	-	17	-	-
% 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: 1 Newtown Commons West Driveway & Washington Avenue
Site Code:
Start Date: 10/14/2025
Page No: 2



Turning Movement Data Plot

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

Counter: MIO:
Set up By JH::

Count Name: 1 Newtown Commons West Driveway & Washington Avenue
Site Code:
Start Date: 10/14/2025

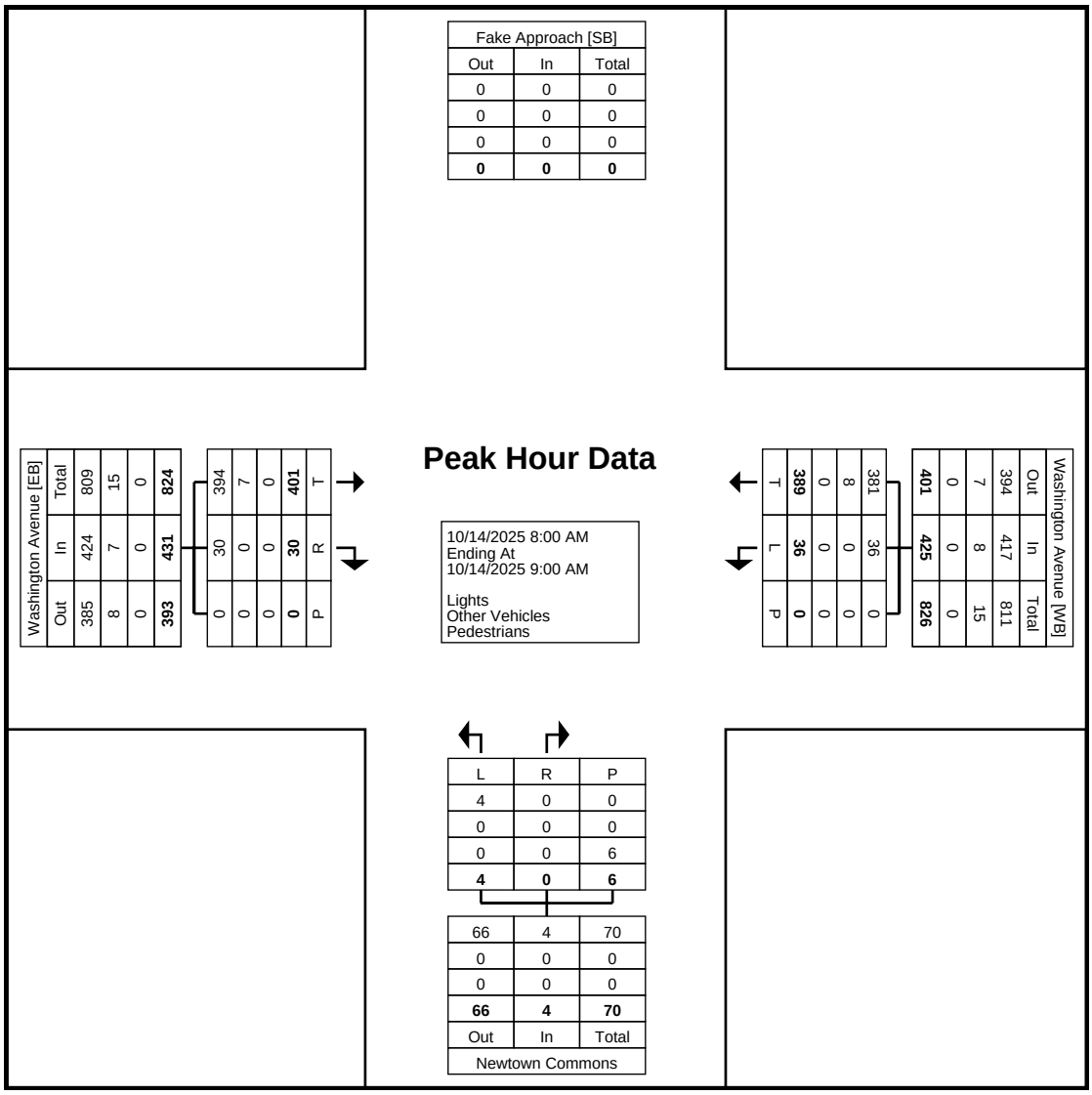
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Washington Avenue Eastbound				Washington Avenue Westbound				Newtown Commons Driveway Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	117	8	0	125	7	84	0	91	0	0	1	0	216
8:15 AM	102	10	0	112	7	91	0	98	0	0	0	0	210
8:30 AM	89	8	0	97	9	92	0	101	2	0	2	2	200
8:45 AM	93	4	0	97	13	122	0	135	2	0	3	2	234
Total	401	30	0	431	36	389	0	425	4	0	6	4	860
Approach %	93.0	7.0	-	-	8.5	91.5	-	-	100.0	0.0	-	-	-
Total %	46.6	3.5	-	50.1	4.2	45.2	-	49.4	0.5	0.0	-	0.5	-
PHF	0.857	0.750	-	0.862	0.692	0.797	-	0.787	0.500	0.000	-	0.500	0.919
Lights	394	30	-	424	36	381	-	417	4	0	-	4	845
% Lights	98.3	100.0	-	98.4	100.0	97.9	-	98.1	100.0	-	-	100.0	98.3
Other Vehicles	7	0	-	7	0	8	-	8	0	0	-	0	15
% Other Vehicles	1.7	0.0	-	1.6	0.0	2.1	-	1.9	0.0	-	-	0.0	1.7
Pedestrians	-	-	0	-	-	-	0	-	-	-	6	-	-
% 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: 1 Newtown Commons West Driveway & Washington Avenue
Site Code:
Start Date: 10/14/2025
Page No: 4



Turning Movement Peak Hour Data Plot (8:00 AM)

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

Counter: MIO:
Set up By JH::

Count Name: 1 Newtown Commons West Driveway & Washington Avenue
Site Code:
Start Date: 10/14/2025

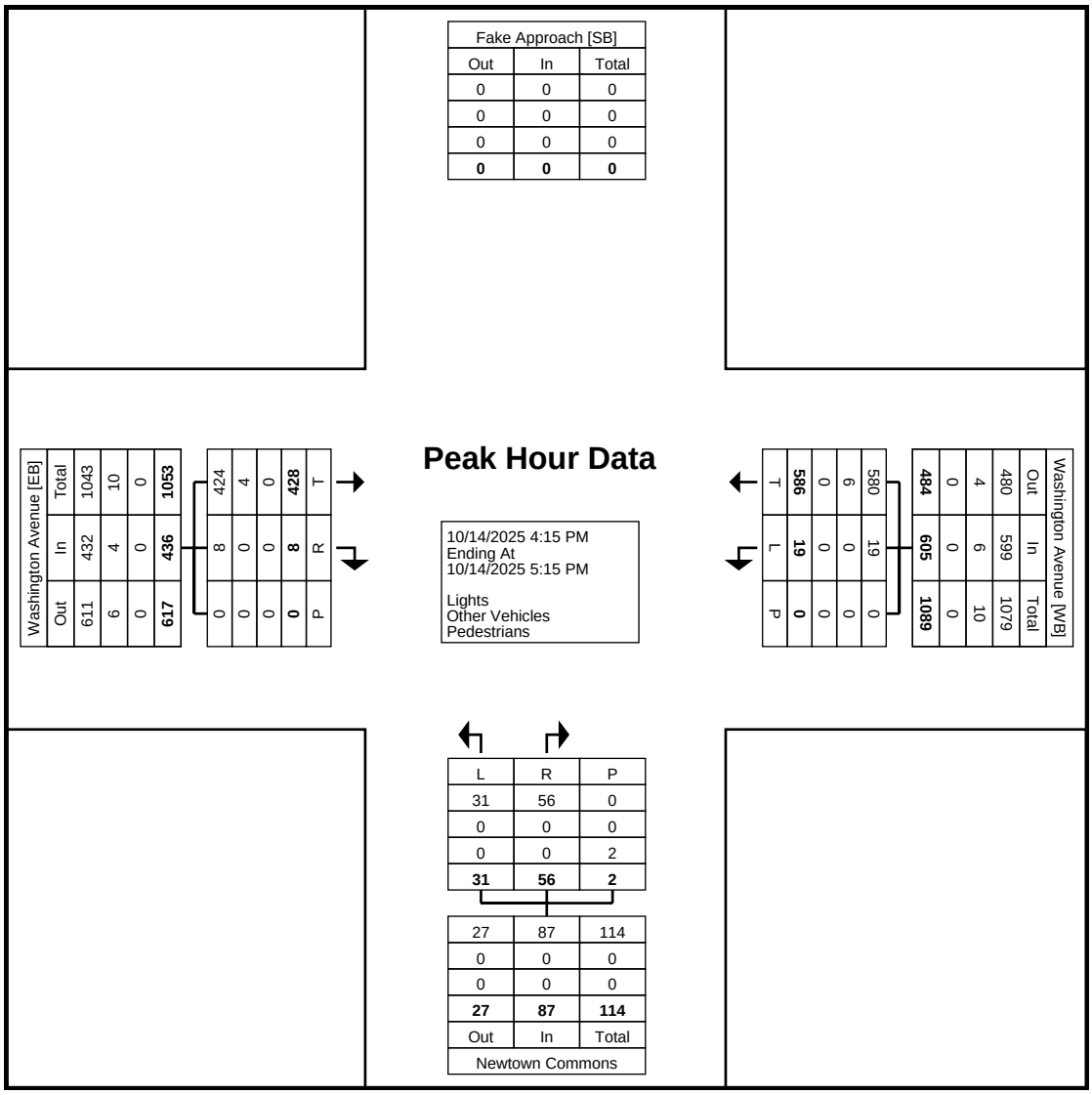
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Washington Avenue Eastbound				Washington Avenue Westbound				Newtown Commons Driveway Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:15 PM	111	2	0	113	1	151	0	152	5	10	0	15	280
4:30 PM	96	4	0	100	8	133	0	141	6	17	0	23	264
4:45 PM	112	1	0	113	5	130	0	135	8	7	0	15	263
5:00 PM	109	1	0	110	5	172	0	177	12	22	2	34	321
Total	428	8	0	436	19	586	0	605	31	56	2	87	1128
Approach %	98.2	1.8	-	-	3.1	96.9	-	-	35.6	64.4	-	-	-
Total %	37.9	0.7	-	38.7	1.7	52.0	-	53.6	2.7	5.0	-	7.7	-
PHF	0.955	0.500	-	0.965	0.594	0.852	-	0.855	0.646	0.636	-	0.640	0.879
Lights	424	8	-	432	19	580	-	599	31	56	-	87	1118
% Lights	99.1	100.0	-	99.1	100.0	99.0	-	99.0	100.0	100.0	-	100.0	99.1
Other Vehicles	4	0	-	4	0	6	-	6	0	0	-	0	10
% Other Vehicles	0.9	0.0	-	0.9	0.0	1.0	-	1.0	0.0	0.0	-	0.0	0.9
Pedestrians	-	-	0	-	-	-	0	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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

Counter: MIO:
Set up By JH::

Count Name: 1 Newtown Commons West Driveway & Washington Avenue
Site Code:
Start Date: 10/14/2025
Page No: 6



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: 2 Existing Site Driveway & Penn Street
Site Code:
Start Date: 10/14/2025

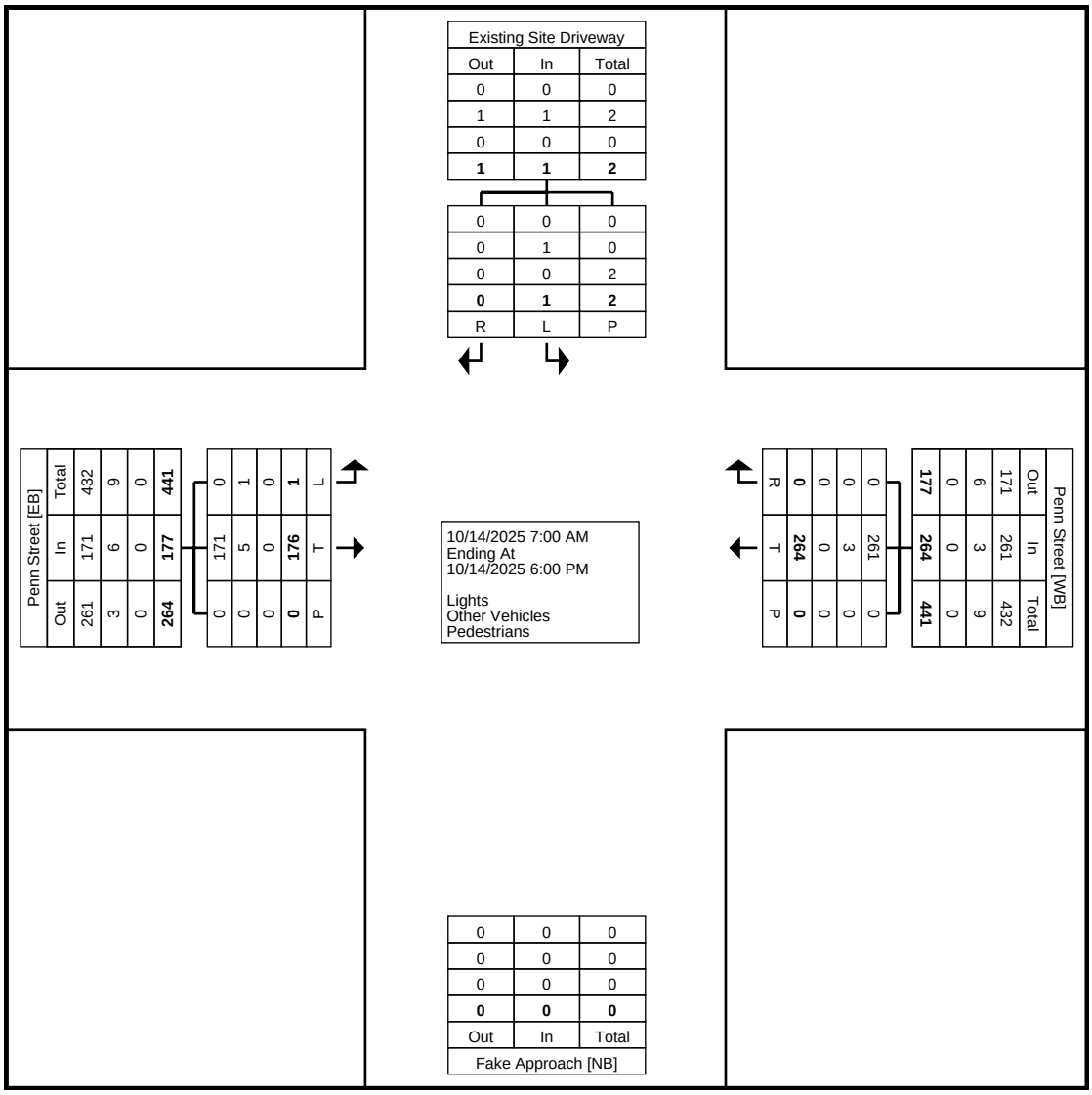
Turning Movement Data

Start Time	Penn Street Eastbound				Penn Street Westbound				Existing Site Driveway Southbound				
	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	1	8	0	9	3	0	0	3	0	0	0	0	12
7:15 AM	0	8	0	8	6	0	0	6	1	0	0	1	15
7:30 AM	0	8	0	8	8	0	0	8	0	0	0	0	16
7:45 AM	0	13	0	13	6	0	0	6	0	0	0	0	19
Hourly Total	1	37	0	38	23	0	0	23	1	0	0	1	62
8:00 AM	0	12	0	12	18	0	0	18	0	0	0	0	30
8:15 AM	0	13	0	13	17	0	0	17	0	0	0	0	30
8:30 AM	0	12	0	12	12	0	0	12	0	0	0	0	24
8:45 AM	0	8	0	8	15	0	0	15	0	0	1	0	23
Hourly Total	0	45	0	45	62	0	0	62	0	0	1	0	107
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	18	0	18	21	0	0	21	0	0	0	0	39
4:15 PM	0	14	0	14	18	0	0	18	0	0	1	0	32
4:30 PM	0	11	0	11	22	0	0	22	0	0	0	0	33
4:45 PM	0	12	0	12	31	0	0	31	0	0	0	0	43
Hourly Total	0	55	0	55	92	0	0	92	0	0	1	0	147
5:00 PM	0	9	0	9	34	0	0	34	0	0	0	0	43
5:15 PM	0	8	0	8	20	0	0	20	0	0	0	0	28
5:30 PM	0	13	0	13	19	0	0	19	0	0	0	0	32
5:45 PM	0	9	0	9	14	0	0	14	0	0	0	0	23
Hourly Total	0	39	0	39	87	0	0	87	0	0	0	0	126
Grand Total	1	176	0	177	264	0	0	264	1	0	2	1	442
Approach %	0.6	99.4	-	-	100.0	0.0	-	-	100.0	0.0	-	-	-
Total %	0.2	39.8	-	40.0	59.7	0.0	-	59.7	0.2	0.0	-	0.2	-
Lights	0	171	-	171	261	0	-	261	0	0	-	0	432
% Lights	0.0	97.2	-	96.6	98.9	-	-	98.9	0.0	-	-	0.0	97.7
Other Vehicles	1	5	-	6	3	0	-	3	1	0	-	1	10
% Other Vehicles	100.0	2.8	-	3.4	1.1	-	-	1.1	100.0	-	-	100.0	2.3
Pedestrians	-	-	0	-	-	-	0	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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

Counter: MIO:
Set up By JH::

Count Name: 2 Existing Site Driveway & Penn Street
Site Code:
Start Date: 10/14/2025



Turning Movement Data Plot

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

Counter: MIO:
Set up By JH::

Count Name: 2 Existing Site Driveway & Penn Street
Site Code:
Start Date: 10/14/2025

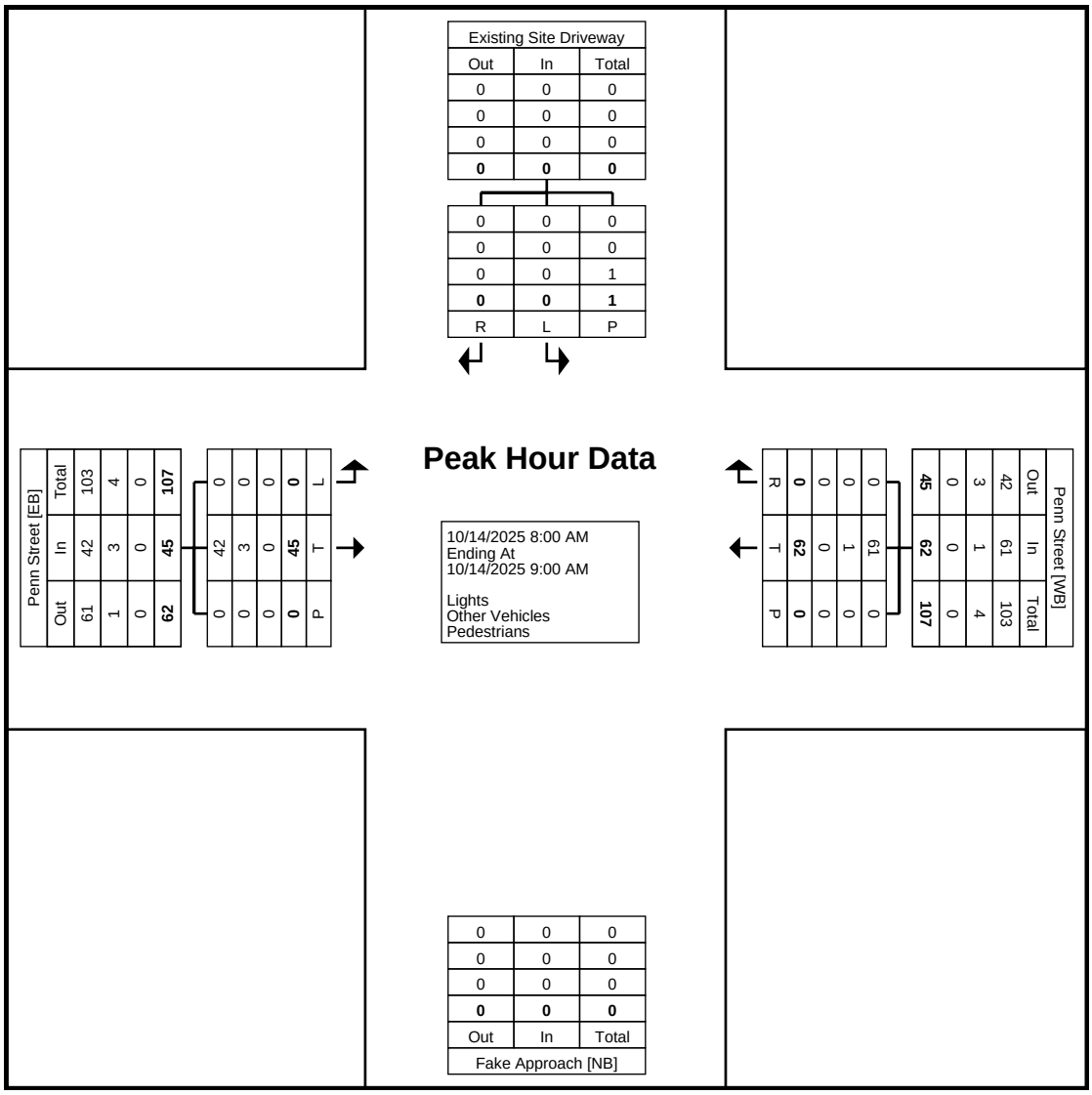
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Penn Street Eastbound				Penn Street Westbound				Existing Site Driveway Southbound				
	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	0	12	0	12	18	0	0	18	0	0	0	0	30
8:15 AM	0	13	0	13	17	0	0	17	0	0	0	0	30
8:30 AM	0	12	0	12	12	0	0	12	0	0	0	0	24
8:45 AM	0	8	0	8	15	0	0	15	0	0	1	0	23
Total	0	45	0	45	62	0	0	62	0	0	1	0	107
Approach %	0.0	100.0	-	-	100.0	0.0	-	-	0.0	0.0	-	-	-
Total %	0.0	42.1	-	42.1	57.9	0.0	-	57.9	0.0	0.0	-	0.0	-
PHF	0.000	0.865	-	0.865	0.861	0.000	-	0.861	0.000	0.000	-	0.000	0.892
Lights	0	42	-	42	61	0	-	61	0	0	-	0	103
% Lights	-	93.3	-	93.3	98.4	-	-	98.4	-	-	-	-	96.3
Other Vehicles	0	3	-	3	1	0	-	1	0	0	-	0	4
% Other Vehicles	-	6.7	-	6.7	1.6	-	-	1.6	-	-	-	-	3.7
Pedestrians	-	-	0	-	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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

Counter: MIO:
Set up By JH::

Count Name: 2 Existing Site Driveway & Penn Street
Site Code:
Start Date: 10/14/2025



Turning Movement Peak Hour Data Plot (8:00 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

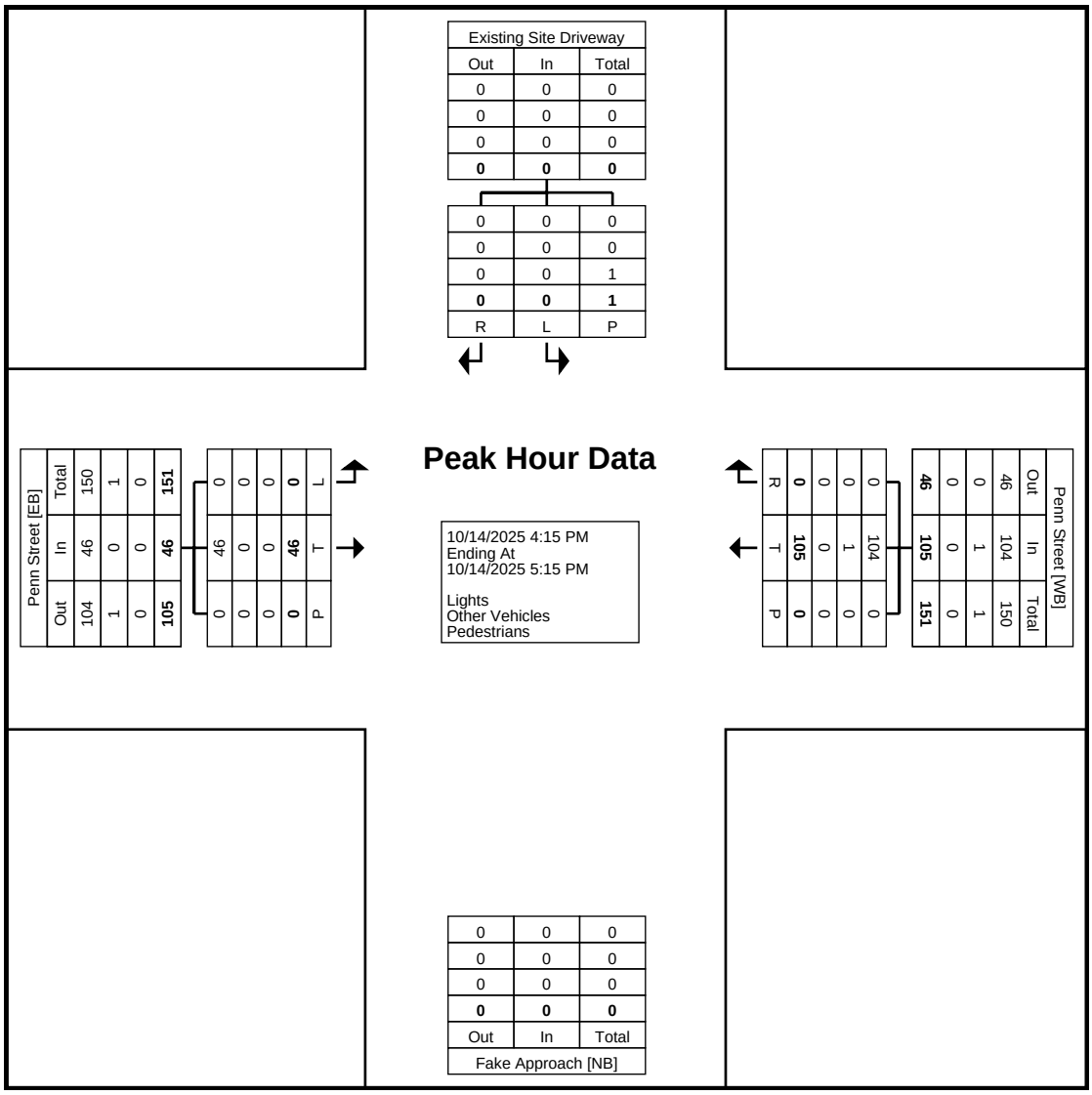
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Penn Street Eastbound				Penn Street Westbound				Existing Site Driveway Southbound				
	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:15 PM	0	14	0	14	18	0	0	18	0	0	1	0	32
4:30 PM	0	11	0	11	22	0	0	22	0	0	0	0	33
4:45 PM	0	12	0	12	31	0	0	31	0	0	0	0	43
5:00 PM	0	9	0	9	34	0	0	34	0	0	0	0	43
Total	0	46	0	46	105	0	0	105	0	0	1	0	151
Approach %	0.0	100.0	-	-	100.0	0.0	-	-	0.0	0.0	-	-	-
Total %	0.0	30.5	-	30.5	69.5	0.0	-	69.5	0.0	0.0	-	0.0	-
PHF	0.000	0.821	-	0.821	0.772	0.000	-	0.772	0.000	0.000	-	0.000	0.878
Lights	0	46	-	46	104	0	-	104	0	0	-	0	150
% Lights	-	100.0	-	100.0	99.0	-	-	99.0	-	-	-	-	99.3
Other Vehicles	0	0	-	0	1	0	-	1	0	0	-	0	1
% Other Vehicles	-	0.0	-	0.0	1.0	-	-	1.0	-	-	-	-	0.7
Pedestrians	-	-	0	-	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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

Counter: MIO:
Set up By JH::

Count Name: 2 Existing Site Driveway & Penn Street
Site Code:
Start Date: 10/14/2025



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

APPENDIX D:
Traffic Volume Development Data

Trip Distribution Calculations

Cordon Method Trip Distribution Calculations

New Trips											
	Weekday A.M. Peak Hour				Weekday P.M. Peak Hour				Overall		
To/From:	IN	OUT	TOTAL	%	IN	OUT	TOTAL	%	TOTAL	%	USE
East via Washington Avenue	425	401	826	44.3%	605	484	1089	44.6%	1915	44.5%	**44%**
West via Washington Avenue	431	393	824	44.2%	436	617	1053	43.1%	1877	43.6%	**44%**
East via Penn Street	62	45	107	5.7%	105	46	151	6.2%	258	6.0%	**6%**
West via Penn Street	45	62	107	5.7%	46	105	151	6.2%	258	6.0%	**6%**
Total:	**963**	**901**	**1864**	**100%**	**1192**	**1252**	**2444**	**100%**	**4308**	**100%**	**100%**

Notes:
(1) New trips are based on the 2025 Existing Volumes at the study area intersections
(2) Percentages highlighted in green were utilized for the New Trip percentages

Volume Development Worksheets

TPD# WORT.00001
10/16/2025
Traffic Volumes Worksheet

Intersection:	**Washington Aveune & Newtown Commons West 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
Existing Counts		**401**	**30**	**36**	**389**		**4**		**0**				**860**
Balancing													0
Existing Volumes (Balanced)	**0**	**401**	**30**	**36**	**389**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**860**
Base growth (0.08% compounded for 3 yrs)		1			1								2
2028 Base Volumes	**0**	**402**	**30**	**36**	**390**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**862**

Site Trips
New
Enter = 29
Exit = 96

Site Trip Assignment % - Enter			44%	44%									
Site Trip Assignment % - Exit							44%		44%				
Site Trips	0	0	13	13	0	0	42	0	42	0	0	0	
2028 Projected Volumes	**0**	**402**	**43**	**49**	**390**	**0**	**46**	**0**	**42**	**0**	**0**	**0**	**972**

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
Existing Counts		**428**	**8**	**19**	**586**		**31**		**56**				**1128**
Balancing													0
Existing Volumes (Balanced)	**0**	**428**	**8**	**19**	**586**	**0**	**31**	**0**	**56**	**0**	**0**	**0**	**1128**
Base growth (0.08% compounded for 3 yrs)		1			1								2
2028 Base Volumes	**0**	**429**	**8**	**19**	**587**	**0**	**31**	**0**	**56**	**0**	**0**	**0**	**1130**

Site Trips
New
Enter = 77
Exit = 43

Site Trip Assignment % - Enter			44%	44%									
Site Trip Assignment % - Exit							44%		44%				
Site Trips	0	0	34	34	0	0	19	0	19	0	0	0	
2028 Projected Volumes	**0**	**429**	**42**	**53**	**587**	**0**	**50**	**0**	**75**	**0**	**0**	**0**	**1236**

TPD# WORT.00001
10/16/2025
Traffic Volumes Worksheet

Intersection:	**Penn Street & Existing Site Driveway**								
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
Existing Counts	**0**	**45**			**62**	**0**				**0**		**0**	**107**
Balancing													0
Existing Volumes (Balanced)	**0**	**45**	**0**	**0**	**62**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**107**
Base growth (0.08% compounded for 3 yrs)		0			0								0
2028 Base Volumes	**0**	**45**	**0**	**0**	**62**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**107**

Site Trips
New
Enter = 29
Exit = 96

Site Trip Assignment % - Enter	6%					6%							
Site Trip Assignment % - Exit										6%		6%	
Site Trips	1	0	0	0	0	2	0	0	0	6	0	6	
2028 Projected Volumes	**1**	**45**	**0**	**0**	**62**	**2**	**0**	**0**	**0**	**6**	**0**	**6**	**122**

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
Existing Counts	**0**	**46**			**105**	**0**				**0**		**0**	**151**
Balancing													0
Existing Volumes (Balanced)	**0**	**46**	**0**	**0**	**105**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**151**
Base growth (0.08% compounded for 3 yrs)		0			0								0
2028 Base Volumes	**0**	**46**	**0**	**0**	**105**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**151**

Site Trips
New
Enter = 77
Exit = 43

Site Trip Assignment % - Enter	6%					6%							
Site Trip Assignment % - Exit										6%		6%	
Site Trips	4	0	0	0	0	5	0	0	0	3	0	2	
2028 Projected Volumes	**4**	**46**	**0**	**0**	**105**	**5**	**0**	**0**	**0**	**3**	**0**	**2**	**165**

APPENDIX E:
Critical and Follow-up Headway Calculations

WORT.00001
Washington Avenue & Newtown Commons West Driveway
Existing and Base Conditions

Crititcal Headway

			tc base	tc hv	phv	t cg	G	t 3lt	**Base Crit**
major left	AM	WB L	4.3	1	0%	0	1	0	**4.3**
	PM	WB L	4.3	1	0%	0	1	0	**4.3**
minor left	AM	NB L	7.1	1	0%	0.1	-3	0.7	**6.1**
	PM	NB L	7.1	1	0%	0.1	-3	0.7	**6.1**
minor right	AM	NB R	6.2	1	0%	0.2	-3	0	**5.6**
	PM	NB R	6.2	1	0%	0.2	-3	0	**5.6**

Follow-up headway

			t fbase	t fhv	phv	**Follow-up**
major left	AM	WB L	3	0.9	0%	**3.0**
	PM	WB L	3	0.9	0%	**3.0**
minor left	AM	NB L	3	0.9	0%	**3.0**
	PM	NB L	3	0.9	0%	**3.0**
minor right	AM	NB R	3.1	0.9	0%	**3.1**
	PM	NB R	3.1	0.9	0%	**3.1**

WORT.00001
Washington Avenue & Newtown Commons West Driveway
Projected Conditions

Crititcal Headway

			tc base	tc hv	phv	t cg	G	t 3lt	**Base Crit**
major left	AM	WB L	4.3	1	2%	0	1	0	**4.3**
	PM	WB L	4.3	1	2%	0	1	0	**4.3**
minor left	AM	NB L	7.1	1	2%	0.1	-3	0.7	**6.1**
	PM	NB L	7.1	1	2%	0.1	-3	0.7	**6.1**
minor right	AM	NB R	6.2	1	2%	0.2	-3	0	**5.6**
	PM	NB R	6.2	1	2%	0.2	-3	0	**5.6**

Follow-up headway

			t fbase	t fhv	phv	**Follow-up**
major left	AM	WB L	3	0.9	2%	**3.0**
	PM	WB L	3	0.9	2%	**3.0**
minor left	AM	NB L	3	0.9	2%	**3.0**
	PM	NB L	3	0.9	2%	**3.0**
minor right	AM	NB R	3.1	0.9	2%	**3.1**
	PM	NB R	3.1	0.9	2%	**3.1**

WORT.00001
Penn Street & Existing Site Driveway
Existing and Base Conditions

Crititcal Headway

			tc base	tc hv	phv	t cg	G	t 3lt	**Base Crit**
major left	AM	EB L	4.3	1	0%	0	-1	0	**4.3**
	PM	EB L	4.3	1	0%	0	-1	0	**4.3**
minor left	AM	SB L	7.1	1	0%	0.1	-1	0.7	**6.3**
	PM	SB L	7.1	1	0%	0.1	-1	0.7	**6.3**
minor right	AM	SB R	6.2	1	0%	0.2	-1	0	**6.0**
	PM	SB R	6.2	1	0%	0.2	-1	0	**6.0**

Follow-up headway

			t fbase	t fhv	phv	**Follow-up**
major left	AM	EB L	3	0.9	0%	**3.0**
	PM	EB L	3	0.9	0%	**3.0**
minor left	AM	SB L	3	0.9	0%	**3.0**
	PM	SB L	3	0.9	0%	**3.0**
minor right	AM	SB R	3.1	0.9	0%	**3.1**
	PM	SB R	3.1	0.9	0%	**3.1**

WORT.00001
Penn Street & Existing Site Driveway
Projected Conditions

Crititcal Headway

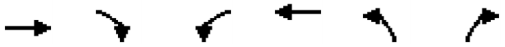
			tc base	tc hv	phv	t cg	G	t 3lt	**Base Crit**
major left	AM	EB L	4.3	1	2%	0	-1	0	**4.3**
	PM	EB L	4.3	1	2%	0	-1	0	**4.3**
minor left	AM	SB L	7.1	1	2%	0.1	-1	0.7	**6.3**
	PM	SB L	7.1	1	2%	0.1	-1	0.7	**6.3**
minor right	AM	SB R	6.2	1	2%	0.2	-1	0	**6.0**
	PM	SB R	6.2	1	2%	0.2	-1	0	**6.0**

Follow-up headway

			t fbase	t fhv	phv	**Follow-up**
major left	AM	EB L	3	0.9	2%	**3.0**
	PM	EB L	3	0.9	2%	**3.0**
minor left	AM	SB L	3	0.9	2%	**3.0**
	PM	SB L	3	0.9	2%	**3.0**
minor right	AM	SB R	3.1	0.9	2%	**3.1**
	PM	SB R	3.1	0.9	2%	**3.1**

APPENDIX F:
Capacity Analysis Worksheets

Existing Conditions



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	401	30	36	389	4	0
Future Volume (vph)	401	30	36	389	4	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	12	14	14
Grade (%)	-1%			1%	-3%	
Storage Length (ft)		75	150		0	75
Storage Lanes		1	1		1	1
Taper Length (ft)			75		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	577			607	276	
Travel Time (s)	15.7			16.6	7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

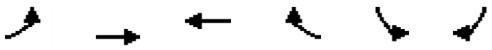
Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	401	30	36	389	4	0
Future Vol, veh/h	401	30	36	389	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	150	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-1	-	-	1	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	436	33	39	423	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	469	0	937	436
Stage 1	-	-	-	-	436	-
Stage 2	-	-	-	-	501	-
Critical Hdwy	-	-	4.3	-	6.1	5.6
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	828	-	353	707
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	753	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	828	-	336	707
Mov Cap-2 Maneuver	-	-	-	-	336	-
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	718	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.8	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	336	-	-	-	828	-
HCM Lane V/C Ratio	0.013	-	-	-	0.047	-
HCM Ctrl Dly (s/v)	15.9	0	-	-	9.6	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	-	0.1	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	45	62	0	0	0
Future Volume (vph)	0	45	62	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	11	11
Grade (%)		-1%	0%		-1%	
Link Speed (mph)		25	25		25	
Link Distance (ft)		518	442		147	
Travel Time (s)		14.1	12.1		4.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	7%	2%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

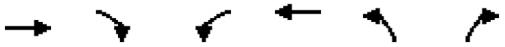
Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	45	62	0	0	0
Future Vol, veh/h	0	45	62	0	0	0
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, %	-	-1	0	-	-1	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	7	2	0	0	0
Mvmt Flow	0	51	70	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	121	70
Stage 1	-	-	-	-	70	-
Stage 2	-	-	-	-	51	-
Critical Hdwy	4.3	-	-	-	6.3	6
Critical Hdwy Stg 1	-	-	-	-	5.2	-
Critical Hdwy Stg 2	-	-	-	-	5.2	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1136	-	-	-	1021	1065
Stage 1	-	-	-	-	1117	-
Stage 2	-	-	-	-	1139	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1136	-	-	-	1021	1065
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1117	-
Stage 2	-	-	-	-	1139	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1136	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Ctrl Dly (s/v)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	428	8	19	586	31	56
Future Volume (vph)	428	8	19	586	31	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	12	14	14
Grade (%)	-1%			1%	-3%	
Storage Length (ft)		75	150		0	75
Storage Lanes		1	1		1	1
Taper Length (ft)			75		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	577			607	276	
Travel Time (s)	15.7			16.6	7.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

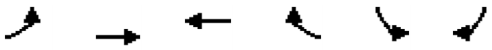
Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	428	8	19	586	31	56
Future Vol, veh/h	428	8	19	586	31	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	150	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-1	-	-	1	-3	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	486	9	22	666	35	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	495	0	1196	486
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	710	-
Critical Hdwy	-	-	4.3	-	6.1	5.6
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	811	-	250	667
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	811	-	243	667
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.3	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	243	667	-	-	811	-
HCM Lane V/C Ratio	0.145	0.095	-	-	0.027	-
HCM Ctrl Dly (s/v)	22.3	11	-	-	9.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q (veh)	0.5	0.3	-	-	0.1	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	46	105	0	0	0
Future Volume (vph)	0	46	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	11	11
Grade (%)		-1%	0%		-1%	
Link Speed (mph)		25	25		25	
Link Distance (ft)		518	442		147	
Travel Time (s)		14.1	12.1		4.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

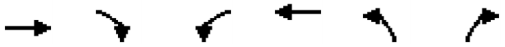
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	105	0	0	0
Future Vol, veh/h	0	46	105	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	0	-	-1	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	52	119	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	119	0	-	0	171	119
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	4.3	-	-	-	6.3	6
Critical Hdwy Stg 1	-	-	-	-	5.2	-
Critical Hdwy Stg 2	-	-	-	-	5.2	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1093	-	-	-	955	1002
Stage 1	-	-	-	-	1061	-
Stage 2	-	-	-	-	1137	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1093	-	-	-	955	1002
Mov Cap-2 Maneuver	-	-	-	-	955	-
Stage 1	-	-	-	-	1061	-
Stage 2	-	-	-	-	1137	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1093	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Ctrl Dly (s/v)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	-

2028 Base (No-Build) Conditions



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	402	30	36	390	4	0
Future Volume (vph)	402	30	36	390	4	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	12	14	14
Grade (%)	-1%			1%	-3%	
Storage Length (ft)		75	150		0	75
Storage Lanes		1	1		1	1
Taper Length (ft)			75		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	577			607	276	
Travel Time (s)	15.7			16.6	7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

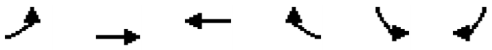
Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	402	30	36	390	4	0
Future Vol, veh/h	402	30	36	390	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	150	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-1	-	-	1	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	437	33	39	424	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	470	0	939	437
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	502	-
Critical Hdwy	-	-	4.3	-	6.1	5.6
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	827	-	352	706
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	827	-	335	706
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	717	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.8	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	335	-	-	-	827	-
HCM Lane V/C Ratio	0.013	-	-	-	0.047	-
HCM Ctrl Dly (s/v)	15.9	0	-	-	9.6	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	-	0.1	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	45	62	0	0	0
Future Volume (vph)	0	45	62	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	11	11
Grade (%)		-1%	0%		-1%	
Link Speed (mph)		25	25		25	
Link Distance (ft)		518	442		147	
Travel Time (s)		14.1	12.1		4.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	7%	2%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	45	62	0	0	0
Future Vol, veh/h	0	45	62	0	0	0
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, %	-	-1	0	-	-1	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	7	2	0	0	0
Mvmt Flow	0	51	70	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	121	70
Stage 1	-	-	-	-	70	-
Stage 2	-	-	-	-	51	-
Critical Hdwy	4.3	-	-	-	6.3	6
Critical Hdwy Stg 1	-	-	-	-	5.2	-
Critical Hdwy Stg 2	-	-	-	-	5.2	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1136	-	-	-	1021	1065
Stage 1	-	-	-	-	1117	-
Stage 2	-	-	-	-	1139	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1136	-	-	-	1021	1065
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1117	-
Stage 2	-	-	-	-	1139	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1136	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Ctrl Dly (s/v)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	429	8	19	587	31	56
Future Volume (vph)	429	8	19	587	31	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	12	14	14
Grade (%)	-1%			1%	-3%	
Storage Length (ft)		75	150		0	75
Storage Lanes		1	1		1	1
Taper Length (ft)			75		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	577			607	276	
Travel Time (s)	15.7			16.6	7.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

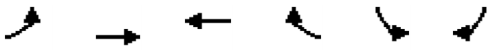
Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	429	8	19	587	31	56
Future Vol, veh/h	429	8	19	587	31	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	150	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-1	-	-	1	-3	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	488	9	22	667	35	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	497	0	1199	488
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	711	-
Critical Hdwy	-	-	4.3	-	6.1	5.6
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	809	-	249	666
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	809	-	242	666
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.3	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	242	666	-	-	809	-
HCM Lane V/C Ratio	0.146	0.096	-	-	0.027	-
HCM Ctrl Dly (s/v)	22.4	11	-	-	9.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q (veh)	0.5	0.3	-	-	0.1	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	46	105	0	0	0
Future Volume (vph)	0	46	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	11	11
Grade (%)		-1%	0%		-1%	
Link Speed (mph)		25	25		25	
Link Distance (ft)		518	442		147	
Travel Time (s)		14.1	12.1		4.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	105	0	0	0
Future Vol, veh/h	0	46	105	0	0	0
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, %	-	-1	0	-	-1	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	52	119	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	119	0	-	0	171	119
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	4.3	-	-	-	6.3	6
Critical Hdwy Stg 1	-	-	-	-	5.2	-
Critical Hdwy Stg 2	-	-	-	-	5.2	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1093	-	-	-	955	1002
Stage 1	-	-	-	-	1061	-
Stage 2	-	-	-	-	1137	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1093	-	-	-	955	1002
Mov Cap-2 Maneuver	-	-	-	-	955	-
Stage 1	-	-	-	-	1061	-
Stage 2	-	-	-	-	1137	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1093	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Ctrl Dly (s/v)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	-

2028 Projected (Build) Conditions



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	402	43	49	390	46	42
Future Volume (vph)	402	43	49	390	46	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	12	14	14
Grade (%)	-1%			1%	-3%	
Storage Length (ft)		75	150		0	75
Storage Lanes		1	1		1	1
Taper Length (ft)			75		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	577			607	276	
Travel Time (s)	15.7			16.6	7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

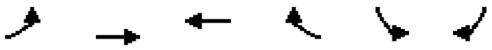
Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	402	43	49	390	46	42
Future Vol, veh/h	402	43	49	390	46	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	150	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-1	-	-	1	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	437	47	53	424	50	46

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	967	437
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	530	-
Critical Hdwy	-	-	4.3	-	6.1	5.6
Critical Hdwy Stg 1	-	-	-	-	4.82	-
Critical Hdwy Stg 2	-	-	-	-	4.82	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	818	-	340	706
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	730	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	818	-	318	706
Mov Cap-2 Maneuver	-	-	-	-	318	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	683	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	1.1	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	318	706	-	-	818	-
HCM Lane V/C Ratio	0.157	0.065	-	-	0.065	-
HCM Ctrl Dly (s/v)	18.4	10.5	-	-	9.7	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q (veh)	0.6	0.2	-	-	0.2	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	45	62	2	6	6
Future Volume (vph)	1	45	62	2	6	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	11	11
Grade (%)		-1%	0%		-1%	
Link Speed (mph)		25	25		25	
Link Distance (ft)		518	442		147	
Travel Time (s)		14.1	12.1		4.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	7%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	45	62	2	6	6
Future Vol, veh/h	1	45	62	2	6	6
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, %	-	-1	0	-	-1	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	7	2	2	2	2
Mvmt Flow	1	51	70	2	7	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	72	0	-	0	124	71
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.3	-	-	-	6.3	6
Critical Hdwy Stg 1	-	-	-	-	5.22	-
Critical Hdwy Stg 2	-	-	-	-	5.22	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1134	-	-	-	1017	1064
Stage 1	-	-	-	-	1115	-
Stage 2	-	-	-	-	1136	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1134	-	-	-	1016	1064
Mov Cap-2 Maneuver	-	-	-	-	1016	-
Stage 1	-	-	-	-	1114	-
Stage 2	-	-	-	-	1136	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.2	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1134	-	-	-	1039
HCM Lane V/C Ratio	0.001	-	-	-	0.013
HCM Ctrl Dly (s/v)	8.2	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	429	42	53	587	50	75
Future Volume (vph)	429	42	53	587	50	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	12	14	14
Grade (%)	-1%			1%	-3%	
Storage Length (ft)		75	150		0	75
Storage Lanes		1	1		1	1
Taper Length (ft)			75		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	577			607	276	
Travel Time (s)	15.7			16.6	7.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	2%	2%	1%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

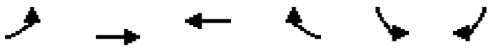
Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	429	42	53	587	50	75
Future Vol, veh/h	429	42	53	587	50	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	150	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-1	-	-	1	-3	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	2	2	1	2	2
Mvmt Flow	488	48	60	667	57	85

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	536	0	1275	488
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	787	-
Critical Hdwy	-	-	4.3	-	6.1	5.6
Critical Hdwy Stg 1	-	-	-	-	4.82	-
Critical Hdwy Stg 2	-	-	-	-	4.82	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	784	-	225	666
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	784	-	208	666
Mov Cap-2 Maneuver	-	-	-	-	208	-
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	526	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.8	18.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	208	666	-	-	784	-
HCM Lane V/C Ratio	0.273	0.128	-	-	0.077	-
HCM Ctrl Dly (s/v)	28.7	11.2	-	-	10	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q (veh)	1.1	0.4	-	-	0.2	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	46	105	5	3	2
Future Volume (vph)	4	46	105	5	3	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	11	11
Grade (%)		-1%	0%		-1%	
Link Speed (mph)		25	25		25	
Link Distance (ft)		518	442		147	
Travel Time (s)		14.1	12.1		4.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	0%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	46	105	5	3	2
Future Vol, veh/h	4	46	105	5	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, %	-	-1	0	-	-1	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	0	1	2	2	2
Mvmt Flow	5	52	119	6	3	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	125	0	-	0	184	122
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	62	-
Critical Hdwy	4.3	-	-	-	6.3	6
Critical Hdwy Stg 1	-	-	-	-	5.22	-
Critical Hdwy Stg 2	-	-	-	-	5.22	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1088	-	-	-	938	998
Stage 1	-	-	-	-	1057	-
Stage 2	-	-	-	-	1125	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1088	-	-	-	933	998
Mov Cap-2 Maneuver	-	-	-	-	933	-
Stage 1	-	-	-	-	1052	-
Stage 2	-	-	-	-	1125	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1088	-	-	-	958
HCM Lane V/C Ratio	0.004	-	-	-	0.006
HCM Ctrl Dly (s/v)	8.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	0

APPENDIX G:
Auxiliary Turn Lane Warrant Analyses

Washington Avenue &
Newtown Commons West Driveway

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Washington Avenue & Newtown Commons West Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday A.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25	**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	49	2.0%	50
	Through	-	390	2.0%	394
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	402	2.0%	407
	Right	Yes	43	2.0%	44

Advancing Volume:	444
Opposing Volume:	451
Left Turn Volume:	50
% Left Turns in Advancing Volume:	11.26%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No			N/A
	Through	-	402	2.0%	N/A
	Right	-	43	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 1**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	50
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: 1.0

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

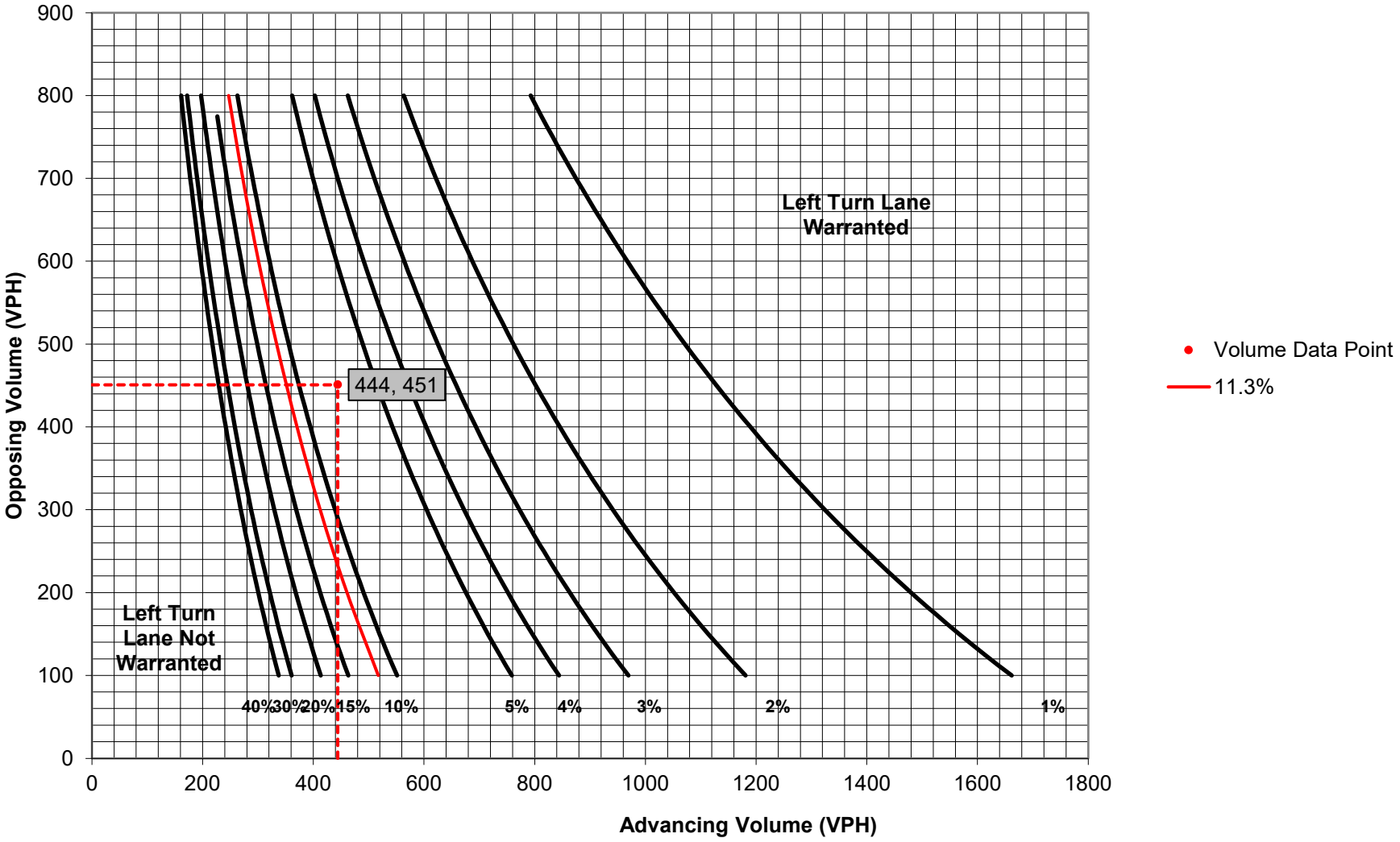
Left Turn Lane Storage Length, Condition A:	**75**	**Feet**
Condition B:	**N/A**	**Feet**
Condition C:	**N/A**	**Feet**
Required Left Turn Lane Storage Length:	**75**	**Feet**

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Washington Avenue & Newtown Commons West Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday A.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25	**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	49	2.0%	N/A
	Through	-	390	2.0%	N/A
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	402	2.0%	N/A
	Right	Yes	43	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	No			N/A
	Through	-	402	2.0%	407
	Right	-	43	2.0%	44

Advancing Volume:	451
Right Turn Volume:	44

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 9

Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	44
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: N/A

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

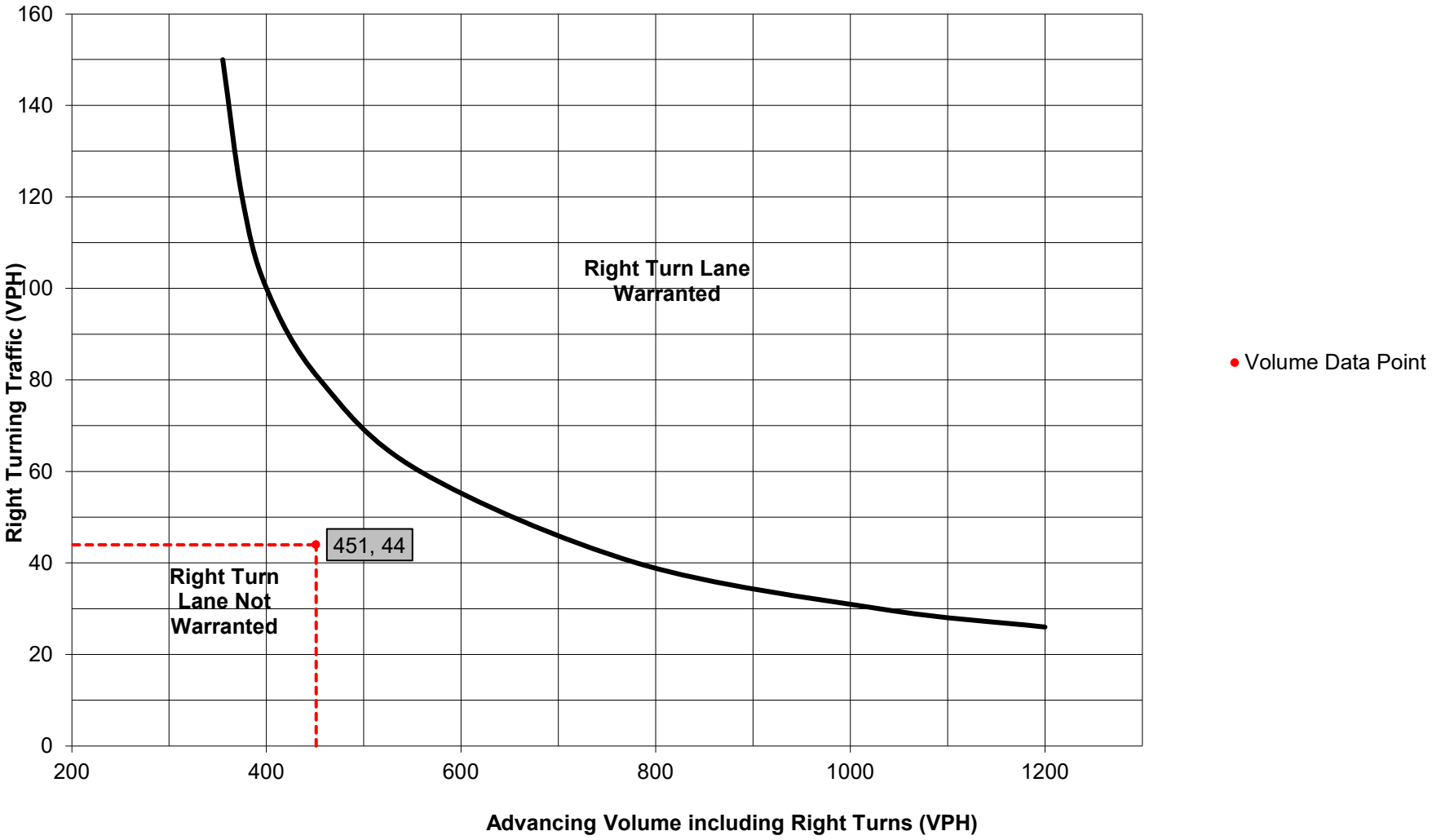
Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	N/A	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Washington Avenue & Newtown Commons West Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday P.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25	**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	53	2.0%	54
	Through	-	587	1.0%	590
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	429	1.0%	432
	Right	Yes	42	2.0%	43

Advancing Volume:	644
Opposing Volume:	475
Left Turn Volume:	54
% Left Turns in Advancing Volume:	8.39%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No			N/A
	Through	-	429	1.0%	N/A
	Right	-	42	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 1**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	54
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: 1.0

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

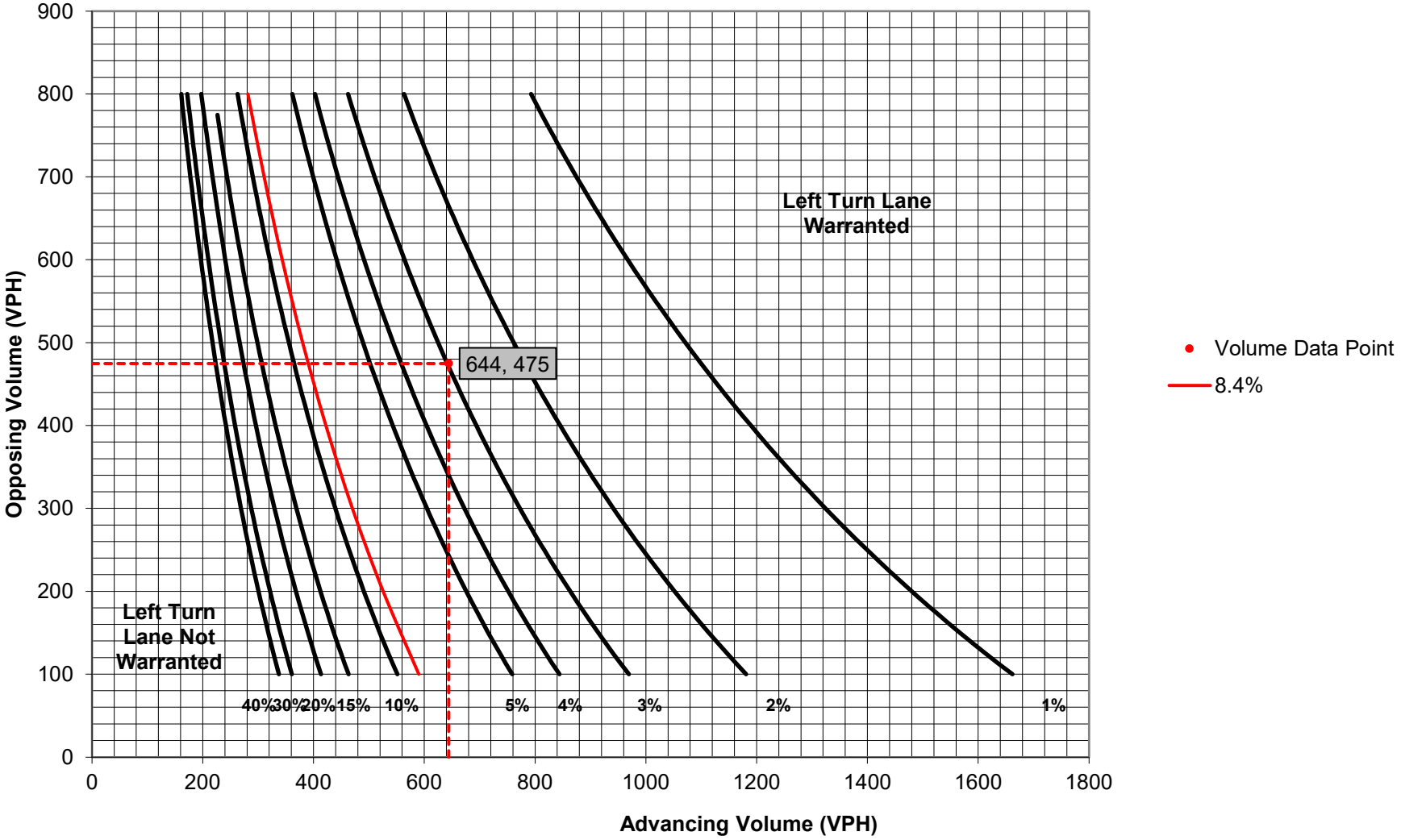
Left Turn Lane Storage Length, Condition A:	**75**	**Feet**
Condition B:	**N/A**	**Feet**
Condition C:	**N/A**	**Feet**
Required Left Turn Lane Storage Length:	**75**	**Feet**

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Washington Avenue & Newtown Commons West Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday P.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25		**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	53	2.0%	N/A
	Through	-	587	1.0%	N/A
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	429	1.0%	N/A
	Right	Yes	42	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	No			N/A
	Through	-	429	1.0%	432
	Right	-	42	2.0%	43

Advancing Volume:	475
Right Turn Volume:	43

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 9

Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	43
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: N/A

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

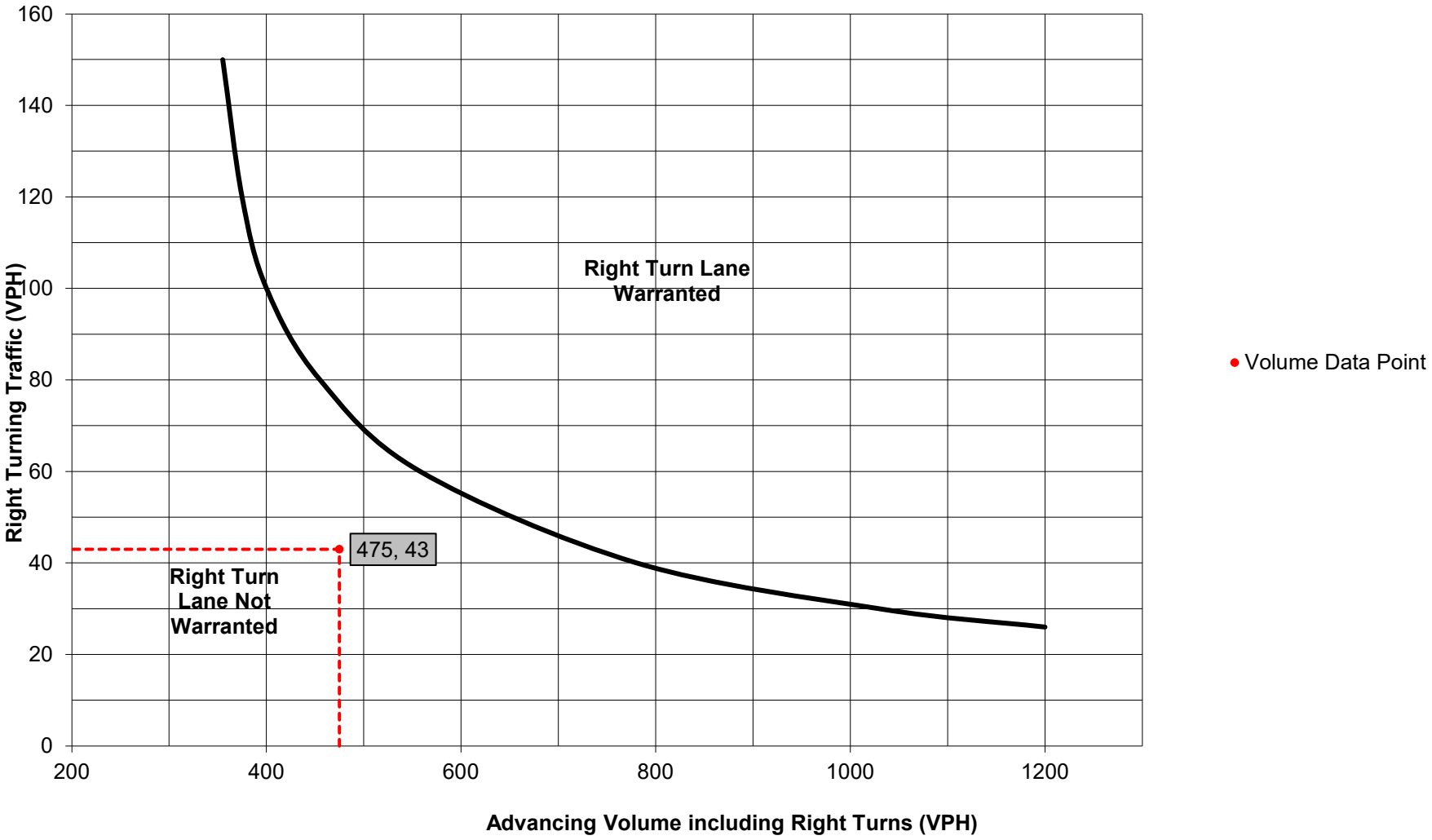
Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	N/A	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Penn Street &
Existing Site Driveway

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Penn Street & Existing Site Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday A.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25		**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	1	2.0%	2
	Through	-	45	7.0%	47
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	62	2.0%	63
	Right	Yes	2	2.0%	3

Advancing Volume:	49
Opposing Volume:	66
Left Turn Volume:	2
% Left Turns in Advancing Volume:	4.08%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No			N/A
	Through	-			N/A
	Right	-			N/A

Advancing Volume:	N/A
Right Turn Volume:	N/A

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **No**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	2
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: N/A

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

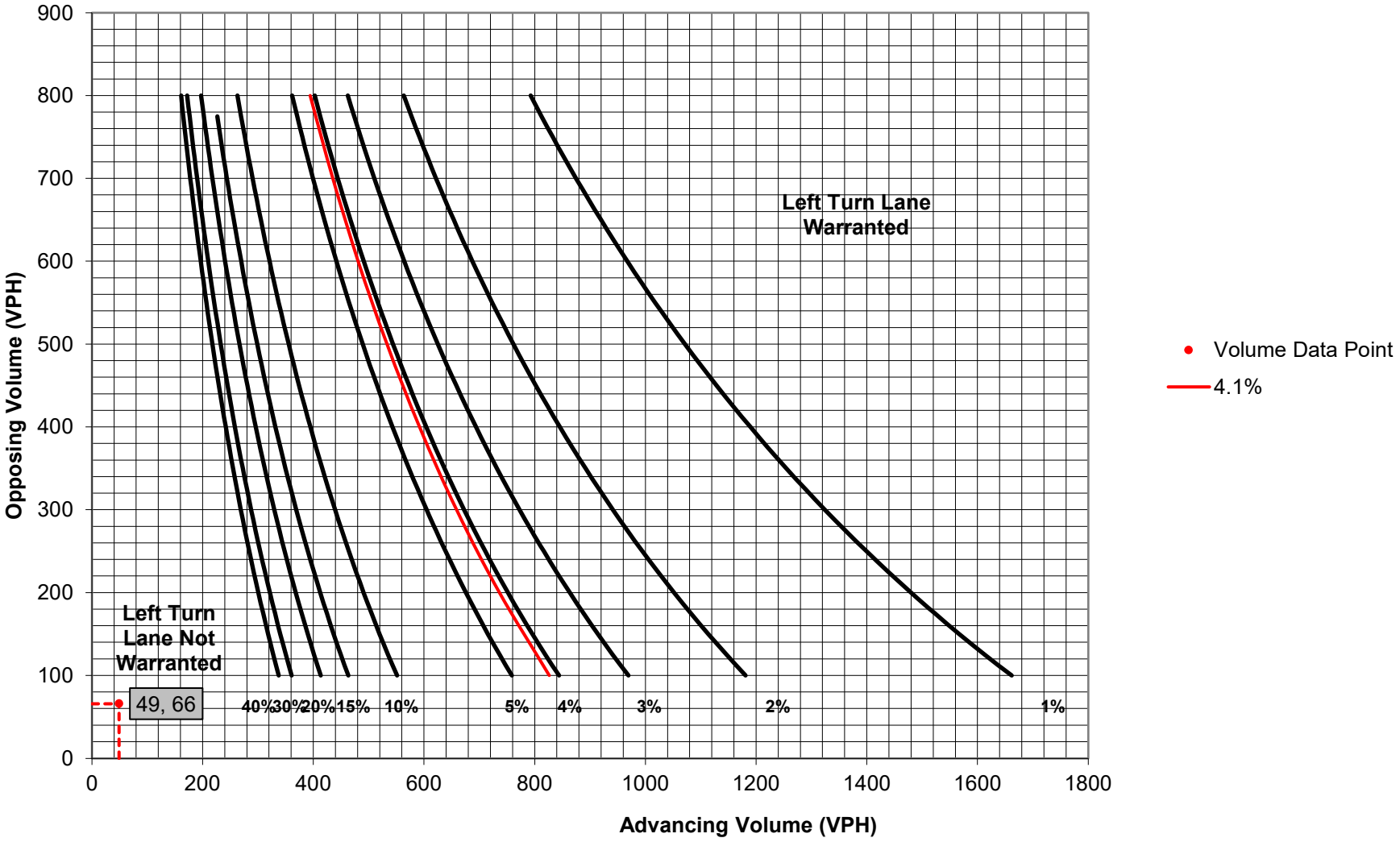
Left Turn Lane Storage Length, Condition A:	**N/A**	**Feet**
Condition B:	**N/A**	**Feet**
Condition C:	**N/A**	**Feet**
Required Left Turn Lane Storage Length:	**N/A**	**Feet**

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Penn Street & Existing Site Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday A.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25		**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	1	2.0%	N/A
	Through	-	45	7.0%	N/A
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	62	2.0%	N/A
	Right	Yes	2	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	No			N/A
	Through	-			0
	Right	-			0

Advancing Volume:	0
Right Turn Volume:	0

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 9

Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	0
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: N/A

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

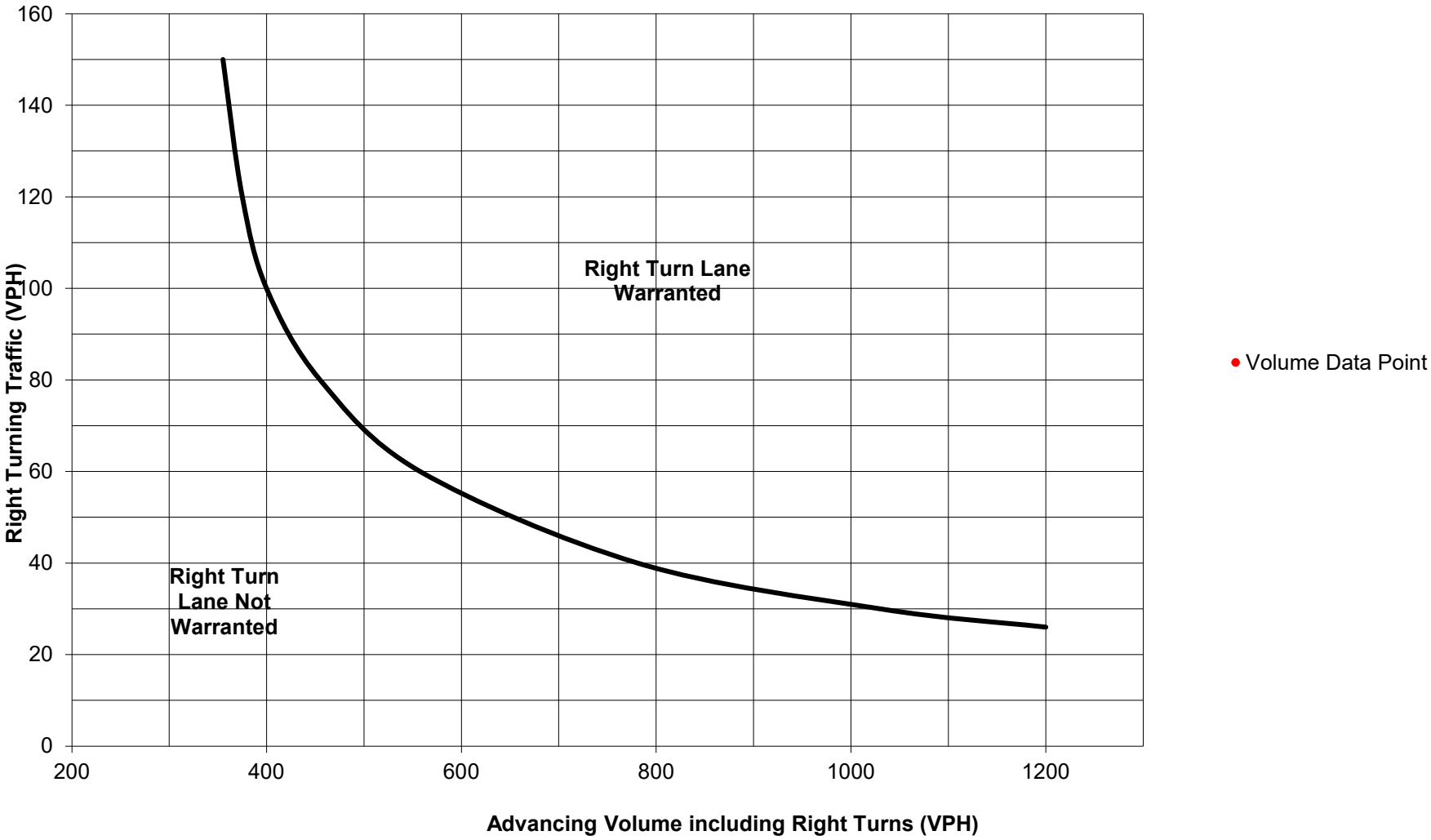
Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	N/A	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Penn Street & Existing Site Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday P.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25		**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	4	2.0%	5
	Through	-	46	0.0%	46
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	105	1.0%	106
	Right	Yes	5	2.0%	6

Advancing Volume:	51
Opposing Volume:	112
Left Turn Volume:	5
% Left Turns in Advancing Volume:	9.80%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No			N/A
	Through	-	105	1.0%	N/A
	Right	-	5	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 1**

Warrant Met?: **No**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	5
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: N/A

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

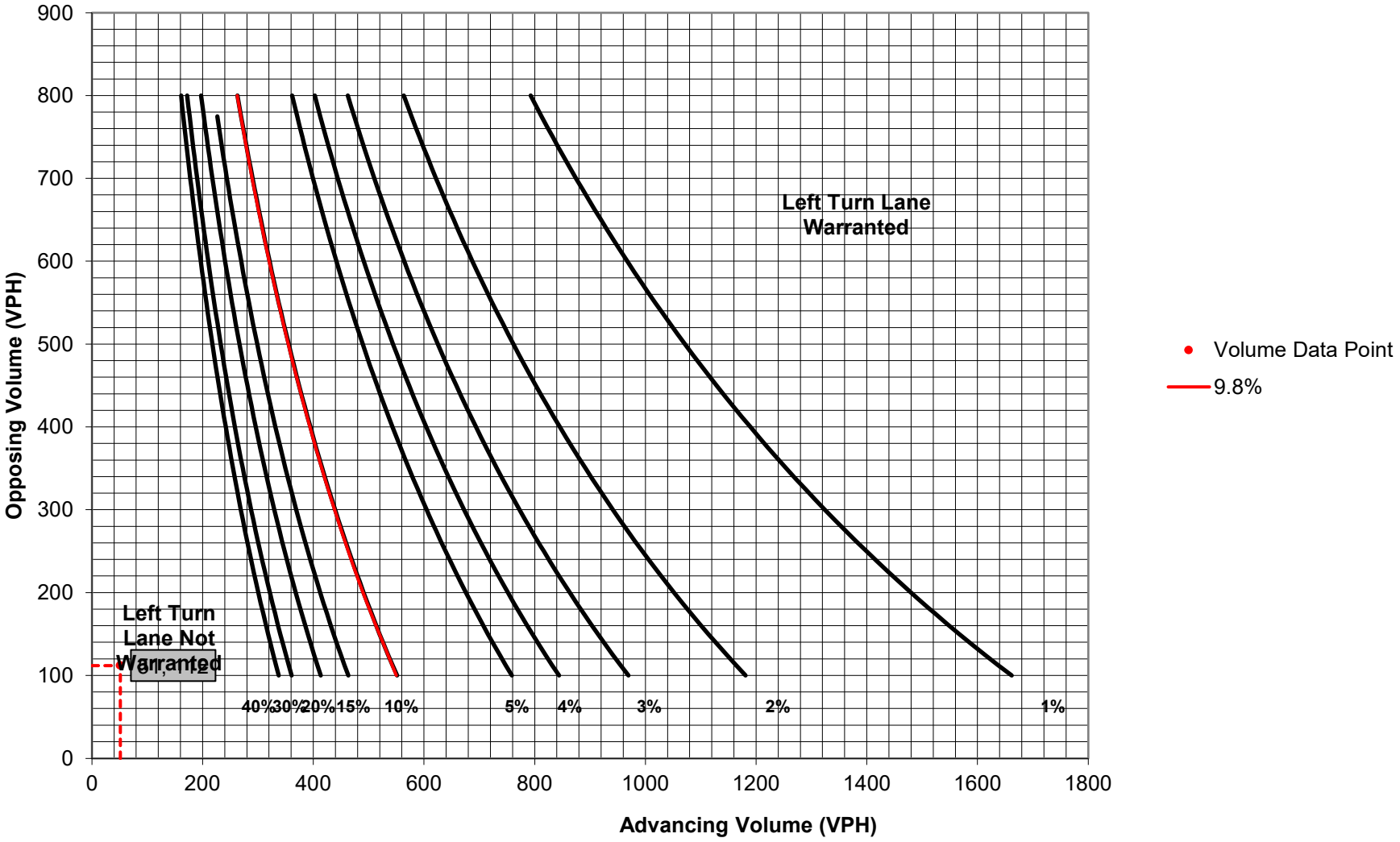
Left Turn Lane Storage Length, Condition A:	**N/A**	**Feet**
Condition B:	**N/A**	**Feet**
Condition C:	**N/A**	**Feet**
Required Left Turn Lane Storage Length:	**N/A**	**Feet**

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Newtown Township	**Analysis Date:**	10/16/2025
County:	Bucks County	**Conducted By:**	MF
PennDOT Engineering District:	6	**Checked By:**	PHS
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Penn Street & Existing Site Driveway

Analysis Period:	2028 Projected Conditions	**Number of Approach Lanes:**	1
Design Hour:	Weekday P.M. Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	25		**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	4	2.0%	N/A
	Through	-	46	0.0%	N/A
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-	105	1.0%	N/A
	Right	Yes	5	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	No			N/A
	Through	-	105	1.0%	106
	Right	-	5	2.0%	6

Advancing Volume:	112
Right Turn Volume:	6

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 9

Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	6
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	60

Average # of Vehicles/Cycle: N/A

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:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	N/A	Feet

Additional Findings:

N/A

Additional Comments / Justifications:

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)

