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TPD# BLC.00149

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## **Spotless Car Wash**

Transportation Impact Assessment

*Phoenixville Borough, Chester County, PA*

### **For Submission To:**

Phoenixville Borough

# SPOTLESS CAR WASH TRANSPORTATION IMPACT ASSESSMENT

*FOR SUBMISSION TO:*

Phoenixville Borough, Chester County, PA

Prepared For:  
**Spotless Brands**

December 18, 2024  
**TPD #BLC.00149**



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# TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	I
INTRODUCTION.....	1
EXISTING TRAFFIC CONDITIONS.....	2
BASE (NO-BUILD) CONDITIONS.....	3
SCHEDULED ROADWAY IMPROVEMENTS.....	4
TRIP GENERATION .....	4
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
95 <sup>TH</sup> PERCENTILE QUEUE ANALYSIS .....	9
AUXILIARY TURN LANE ANALYSIS .....	11
RECOMMENDATIONS & CONCLUSIONS .....	11

## FIGURES 1 – 10

### TECHNICAL APPENDICES

- Appendix A: Project Correspondence
- Appendix B: Study Area Photographs
- Appendix C: Manual Traffic Count Printouts
- Appendix D: Nearby Developments
- Appendix E: Trip Generation and Queuing Data
- Appendix F: Volume Development Worksheets
- Appendix G: Capacity Analyses
- Appendix H: Traffic Signal Plans
- Appendix I: Auxiliary Turn Lane Warrant Analyses

## EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed Spotless Car Wash development on the roadway network in Phoenixville Borough, Chester County, PA. Based on this evaluation, the following conclusions were reached:

1. The project scope and the extent of the study area were confirmed with Borough staff. The study area intersections included in this TIS are as follows:
  - » Kimberton Road (SR 0113) and Schuylkill Road/Nutt Road
  - » Schuylkill Road (SR 0023) and Site Driveway
  - » Kimberton Road (SR 0113) and Site Driveway
2. The project site is located on the southwest corner of the intersection of Kimberton Road (SR 0113) and Schuylkill Road/Nutt Road. The development proposal consists of using the existing building (and squaring off the northeast corner) to provide a 11,272 s.f. Automated Car Wash. The car wash will have a wet tunnel (northbound direction) for the car wash, and 2 tunnels (southbound direction) available for drying/detailing after the car wash.
3. The subject site is currently served by one (1) full-access driveway to Kimberton Road (SR 0113) and one (1) right-in/right-out driveway to Schuylkill Road. With redevelopment of the site, no modifications to the site access driveways are proposed. In addition, the one-way counterclockwise traffic circulation that exists around the western and southern sides of the existing building will remain with the proposed car wash use.
4. Upon full build-out, the proposed development is expected to generate 42 new vehicle-trips during the weekday P.M. peak hour and 76 new vehicle-trips during the Saturday midday peak hour.
5. Under the 2026 projected conditions with the development of the proposed site, the study area intersections will operate at the same overall intersection level of service (ILOS) as under the 2026 base conditions during the weekday P.M. and Saturday midday peak hours.
6. All levels of service at the study area intersection comply with the requirement outlined in PennDOT's TIS Guidelines.
7. Levels of Service (LOS) for the study area intersections have been summarized in matrix form. **Table I** details the overall intersection LOS for each study area intersection.

**TABLE I**  
**OVERALL INTERSECTION LEVEL OF SERVICE SUMMARY**

Intersection	Weekday P.M. Peak Hour			Saturday Midday Peak Hour			Meets LOS Requirements?
	Existing	2026 Conditions		Existing	2026 Conditions		
		Base	Projected		Base	Projected	
Schuylkill Road/Nutt Road & Kimberton Road (SR 0113)	C (29.1)	C (32.1)	C (33.3)	C (33.9)	C (34.4)	C (34.7)	YES
Schuylkill Road (SR 0023) & Right-In/Right-Out Driveway	--	--	A (0.1)	--	--	A (0.2)	YES
Kimberton Road (SR 0113) & Site Driveway	--	--	A (0.4)	--	--	A (0.9)	YES

*Base = No-Build; Projected = Build*

8. TPD recommends the following in conjunction with the proposed development:
- » Coordinate with PennDOT, as needed, per the 11/27/24 Bowman review related to signage, ADA ramps and striping.
  - » Monitor the on-site queuing, and assign staff to direct on-site motorists should the queue approach capacity.

## INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Study (TIS) for the proposed Spotless Car Wash Development in Phoenixville Borough, Chester County, Pennsylvania. The project site is located at the southwest corner of Kimberton Road (SR 0113) and Schuylkill Road/Nutt Road (SR 0023), as shown in **Figure 1**. The subject site consisted of a former ±11,178 square-foot (s.f.) Rite Aid with a drive-through. As shown in **Figure 2**, The development proposal consists of using the existing building (and squaring off the northeast corner) to provide a 11,272 s.f. Automated Car Wash. The car wash will have a wet tunnel (northbound direction) for the car wash, and 2 tunnels (southbound direction) available for drying/detailing after the car wash.

This report has been prepared in accordance with PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated February 2024. The project scope and the extent of the study area were confirmed with Borough staff. All relevant correspondence pertaining to this project has been included in **Appendix A**.

### Site Access Locations

The subject site is currently served by one (1) full-access driveway to Kimberton Road (SR 0113) and one (1) right-in/right-out driveway to Schuylkill Road. With redevelopment of the site, no modifications to the site access driveways are proposed. In addition, the one-way counterclockwise traffic circulation that exists around the western and southern sides of the existing building will remain with the proposed car wash use.

### Existing Roadway Network

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

TABLE 1  
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	Functional Classification/ Roadway Type	Predominant Directional Orientation	Average Daily Traffic	Posted Speed Limit
Kimberton Road	State (SR 0113)	Minor Arterial	North-South	15,236	35 mph
Schuylkill Road/Nutt Road	State (SR 0023)	Minor Arterial	East-West	21,766	35 mph

### Bicycle and Pedestrian Facilities

Based on observations during field visits at the study area intersections, sidewalks currently accommodate pedestrian and bicycle traffic in the vicinity of the proposed development. The traffic signal at the intersection of Kimberton Road (SR 0113) and Schuylkill Road/Nutt Road (SR 0023) is equipped with pedestrian crossing signals, pedestrian push buttons and pedestrian crosswalks.

## Mass Transit Facilities

Chester County and the Phoenixville Borough area are provided with public transportation by SEPTA. SEPTA Bus Route 139, which runs from Limerick to King of Prussia, a stop on Schuylkill Road across from the site and in Phoenixville Plaza.

## Crash Data Investigation

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

**TABLE 2**  
**PENNDOT REPORTABLE CRASH DATA**

Study Area Intersection	Number of Reportable Crashes				
	2019	2020	2021	2022	2023
Kimberton Road (SR 0113) and Schuylkill Road/Nutt Road (SR 0023)	0	1	2	3	4

Based on a review of the crash data, there were no continuous twelve-month periods during the past five years where 5 or more crashes occurred that were deemed correctable. Although there were five crashes during the twelve-month period from 2022-2023, the majority (five out of seven) crashes were caused by improper driver actions, which are not correctable.

## EXISTING TRAFFIC CONDITIONS

Traffic counts were conducted on 15-minute intervals during the weekday evening (4:00 to 6:00 P.M.) and Saturday midday (11:00 A.M. to 2:00 P.M.) peak periods. Peak hours and count dates for the study area intersections are identified in **Table 3**.

**TABLE 3**  
**TRAFFIC COUNT INFORMATION**

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour <sup>1</sup>
Schuylkill Road/Nutt Road (SR 0023) & Kimberton Road (SR 0113)	Tuesday, October 1, 2024	Weekday P.M.	5:00 to 6:00 P.M.
	Saturday, September 28, 2024	Saturday Midday	11:45 A.M. to 12:45 P.M.

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

Existing condition traffic volumes for the weekday P.M. and Saturday peak hours are illustrated in **Figures 3-4**, respectively. Traffic count data sheets are provided in **Appendix C**.

## BASE (NO-BUILD) CONDITIONS

### Annual Background Growth

A background growth factor for the roadways in the study area was developed based on growth factors for August 2024 to July 2025 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.44% per year in Chester County for urban non-interstate roadways. As such, the background growth factor was applied annually to yield overall growth percentages of 0.88% (0.44% per year, compounded over 2 years) for 2026 future conditions.

### Nearby Proposed Developments

Base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the future conditions. Based on coordination with Phoenixville Borough staff, the following nearby planned developments were specifically included in this study:

**Odessa Residential** is a proposed mixed-use development consisting of 168 townhomes, 224 apartments, and 12,000 square feet of retail space. The site is located on the east side of Township Line Road, south of Fillmore Street. Access is proposed via one driveway to Fillmore Street and one driveway to Township Line Road. Trip distributions for this development were developed based on data provided by Bowman.

**Trieste Residential** is a proposed residential development consisting of 195 townhomes. The site is located on the north side of Fillmore Street, east of Township Line Road. Access is proposed via one driveway to Fillmore Street. Trip distributions for this development were developed based on data provided by Bowman.

**Paradise Village** is a proposed mixed-use development consisting of a 4,500 square-foot restaurant, and a 3,670 square-foot coffee shop. The site is located on the north side of Hall Road, between Paradise Street and Bridge Street. Access is proposed via two driveways to Hall Street and one driveway to Paradise Street. Trip distributions for this development were developed based on data provided by Bowman.

**Steelworks Village** is a proposed mixed-use development consisting of 40,600 square feet of retail and restaurant space. The site is located on the west side of Bridge Street, north of Wheatland Street. Access is proposed via one driveway to Bridge Street and one driveway to Hall Street. Trip distributions for this development were developed based on data provided by Bowman.

**348-370 Bridge Street** is a proposed mixed-use development consisting of 76 apartments and 19,380 square feet of retail space. The site is located on the southeast and southwest corners of Bridge Street and Prospect Street. Access is proposed via one driveway to Bridge Street and three driveways to Prospect Street. Trip distributions for this development were developed based on data provided by Bowman.

**Aldi Food Market and Bank with Drive-Through** is a proposed mixed-use development consisting of a 19,680 square-foot Aldi Food Market and a 3,475 square-foot bank with a drive thru. The site is located on the north side of Schuylkill Road, west of the Shoppes at Valley Forge/Kimberton Square. Access is proposed via one driveway to Schuylkill Road (SR 0023) and cross access to the adjacent Kimberton Square Driveway. Trip distributions for this development were developed based on data provided by Dynamic Traffic.

**Hares Hill Road Elementary School** is a proposed elementary school that will be attended by 700 students in grades 2 through 6. The site is located on the east side of Hares Hill Road between Schuylkill Road (SR 0023) and Ridge Road. Access is proposed via one driveway to Ridge Road and one driveway to Hares Hill Road. Trip distributions for this development were developed based on data provided by Bowman.

The additional traffic volumes due to background growth and background developments were added to the existing traffic data to produce the 2026 base (no-build) condition traffic volumes. The 2026 base condition

volumes for the weekday P.M. and Saturday midday peak hours are illustrated in **Figures 5 and 6**. Trip distributions for the background developments are provided in **Appendix D**.

## SCHEDULED ROADWAY IMPROVEMENTS

Based on a review of the Pennsylvania Transportation Improvement Program (TIP), there are programmed roadway improvements in the vicinity of the proposed site. These improvements, as part of Project #115423, involve safety improvements at 11 signalized intersections along Route 23, including the intersection of Kimberton Road (SR 0113) and Schuylkill Road/Nutt Road. These improvements are expected to cost a total of \$3,000,000 and are scheduled during Fiscal Year 2025. It is TPD’s understanding that the improvements include replacing the existing signal heads and push buttons and installing new retroreflective backplates to the existing signal heads, which is not anticipated to impact roadway operations.

## TRIP GENERATION

As requested by the Borough’s Traffic Engineer, Bowman, peak period trip generation data was collected at four (4) existing Flagship Car Wash sites in Maryland and Virginia that have similar characteristics to the proposed site. Vehicle counts were completed during the weekday P.M. and Saturday midday time periods at each locations. Utilizing the counts, peak hours, which is the highest four consecutive 15-minute intervals (i.e. 4:00-5:00 P.M.), were determined. **Table 4** shows summarizes the trip generation data for the analyzed time periods. Additional details regarding the trip generation data are summarized in a memo included in **Appendix E**.

Please note, due to the lack of available data for the average weekday peak hour calculations, TPD applied a factor of 10 to the number of trips generated by the weekday P.M. peak hour of the adjacent street. **Table 4** shows the ITE trip generation data for the analyzed time periods.

**TABLE 4**  
**ITE TRIP GENERATION DATA**

Land Use	Time Period	Equations/Rates	Entering %	Exiting %	Pass-By %
Automated Car Wash	Weekday P.M. Peak Hour	$T = 7.40*(X)$	50%	50%	50% <sup>2</sup>
	Saturday Midday Peak Hour	$T = 13.44*(X)$	50%	50%	50% <sup>2</sup>
	Weekday (24-Hour Total)	$T = 74.00*(X)$ <sup>1</sup>	50%	50%	--

*T = number of site-generated vehicular trips*

*X = independent variable (ksf, thousand square feet of gross leasable area)*

<sup>1</sup> No ITE data available, used 10\*weekday P.M. peak hour adjacent street rate

<sup>2</sup>No ITE data available, see explanation in Pass-By Trips section of this report

### Pass-By Trips

According to the *Trip Generation Manual*, typically for retail or service establishments, not all of the trips generated by the proposed development will be new to the surrounding area. A distinction was made between “new” trips, which are trips made to/from the study area for the express purpose of visiting the site, and “pass-by” trips, which are trips made to the site by traffic passing the carwash on the adjacent roadways en route to another destination. The pass-by trips do not add any additional traffic to the surrounding intersections but will result in shifts in turning movement at the site driveway intersections.

Spotless Car Wash facilities are membership-heavy uses and attract customers in relatively close proximity to the facility. With members' knowledge of not only the traffic patterns in the area but also of the specific traffic surges during particular times of day, it is anticipated that pass-by traffic would constitute a majority of trips during those time periods. Typically, members using the facility during the roadway peak hours would do so while commuting or while traveling to/from commercial facilities along the corridor and in the region. It is anticipated that new trips to the car wash will be more prevalent during off-peak hours.

TPD has reviewed and prepared various studies for car wash facilities during which the consensus is to utilize a pass-by rate of 50%. The justification is that this land use operates similarly to other car-related service land uses such as ITE LUC 944 (Gasoline/Service Station) and ITE LUC 945 (Convenience Store/Gas Station), which have higher pass-by rates. The trip generation summary is provided in **Table 5**.

**TABLE 5  
TRIP GENERATION SUMMARY**

Time Period	Total Trips	Pass-By Trips			New Trips		
		Total	Enter	Exit	Total	Enter	Exit
Weekday (24-hour period)	834	--	--	--	--	--	--
Weekday PM Peak Hour	83	42	21	21	42	20	21
Saturday Peak Hour	152	76	38	38	76	38	38

Based on the trip generation analysis summarized in **Table 5**, the proposed development is anticipated to generate approximately 42 new trips during the weekday P.M. peak hour and 76 new trips during the Saturday midday peak hour.

### **Trip Generation Comparison to Former Use**

As previously indicated, the subject site was formerly occupied by a Rite Aid (11,178± s.f.) that generated traffic to the surrounding roadway network. For purposes of the comparison, ITE data for Land Use Code 881 (Pharmacy/Drugstore with Drive-Through) were utilized for the former use and the above summarized ITE car wash data were utilized for the proposed use. A trip generation comparison was conducted to quantify the potential reduction in vehicular trip generation for the subject site with the proposed development proposal, as shown in **Table 6**.

**TABLE 6  
TRIP GENERATION COMPARISON**

Time Period	Scenario	External Trips		
		Total	Enter	Exit
Weekday (24-hour period)	Proposed Car Wash <sup>1</sup>	834	417	417
	Former Rite Aid <sup>2</sup>	1220	610	610
	<i>Difference</i>	-386	-193	-193
Weekday PM Peak Hour	Proposed Car Wash <sup>1</sup>	83	42	41
	Former Rite Aid <sup>2</sup>	115	57	58
	<i>Difference</i>	-32	-15	-17
Saturday Peak Hour	Proposed Car Wash <sup>1</sup>	152	76	76
	Former Rite Aid <sup>2</sup>	98	48	50
	<i>Difference</i>	+54	+28	+26

<sup>1</sup> ITE LUC 948 (Automated Car Wash)

<sup>2</sup> ITE LUC 881 (Pharmacy/Drugstore with Drive-Through)

As shown in **Table 6**, the proposed car wash is anticipated to generate less traffic than the former Rite Aid use during a typical weekday and during the weekday P.M. peak hour. During the Saturday midday peak hours, the proposed car wash is anticipated to generate more trips than the Rite Aid use, or less than 1 additional trip per minute during the peak hour.

## TRIP DISTRIBUTION

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

**TABLE 7  
TRIP DISTRIBUTION PERCENTAGES – NEW TRIPS**

Direction - To/From	Assignment (To/From)	Distribution Percentage
East	via Nutt Road (SR 0023)	45%
West	via Schuylkill Road (SR 0023)	30%
South	via Kimberton Road (SR 0113)	25%

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

**TABLE 8**  
**TRIP DISTRIBUTION PERCENTAGES – PASS-BY TRIPS**

Direction - From	Pass-by Trip Distribution Percentages	
	Weekday P.M.	Saturday Midday
Eastbound via Schuylkill Road (SR 0023)	28%	23%
Westbound via Nutt Road (SR 0023)	30%	32%
Northbound via Kimberton Road (SR 0113)	21%	27%
Southbound via Kimberton Road (SR 0113)	21%	18%

The assignment of site-generated trips for the proposed development during the weekday P.M. and Saturday midday peak hours are shown in **Figures 7 and 8**, respectively.

## PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2026 base (no-build) condition traffic volumes to develop 2026 projected (build) condition traffic volumes. The 2026 projected condition traffic volumes for the weekday P.M. and Saturday midday peak hours are shown in **Figures 9 and 10**, respectively. Traffic volume development worksheets are contained in **Appendix F**.

## LEVELS OF SERVICE FOR AN INTERSECTION

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

**TABLE 9**  
**LEVEL OF SERVICE CRITERIA**  
**UNSIGNALIZED AND SIGNALIZED INTERSECTIONS<sup>1</sup>**

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

<sup>1</sup> Obtained from Exhibits 19-8 and 20-2 of the Transportation Research Board's Highway Capacity Manual 6<sup>th</sup> Edition

## CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted for the weekday P.M., and Saturday midday peak hours at the study area intersections. These analyses were conducted according to the methodologies contained in the *Highway Capacity Manual 6<sup>th</sup> Edition* (HCM) using *Synchro 11* software, a Trafficware product.

The following conditions were analyzed, as applicable:

- » Existing conditions;
- » 2026 Base conditions (Build-out year without development);
- » 2026 Projected conditions (Build-out year with development);

It should be noted that based on methodologies contained in Chapter 10 of PennDOT's Publication 46, TPD adjusted the following HCM default values in the *Synchro 11* capacity analysis. These adjustments were made at the signalized intersections within the study area for all time periods based on the study area location being classified as Suburban:

- » Base saturation flow rates for signalized intersections. The saturation flow rate was changed from the default value of 1900 to 1800 based on Exhibit 10-9.
- » Start-up lost time and extension of effective green time for signalized intersections. The startup lost time was changed from the default value of 2.0 seconds to 2.5 seconds. Based on the total clearance time (yellow plus all-red time) being greater than 5 seconds, the extension of green time was changed from the default value of 2 seconds to 3.5 seconds. These adjusted values were based on Exhibit 10-10.

In addition, capacity analyses were conducted at the site driveway intersections under the 20## projected conditions. The capacity analysis worksheets are included in **Appendix G**. The PennDOT-approved signal plans are included in **Appendix H**.

PennDOT's Transportation Impact Study Guidelines outlined in PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated February 2024 contain the following criteria regarding levels of service:

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

## LEVELS OF SERVICE IN THE STUDY AREA

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

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

Intersection	Movement	Level of Service					
		Weekday P.M. Peak Hour			Saturday Midday Peak Hour		
		Existing	Base	Projected	Existing	Base	Projected
Schuylkill Road/Nutt Road (SR 0023) & Kimberton Road (SR 0113)	EB L	B	B	B	B	B	B
	EB T/R	C	C	C	B	C	C
	WB L	B	B	B	B	B	B
	WB T	C	C	C	B	C	C
	WB R	B	B	B	B	B	B
	NB L	E	E	E	D	D	D
	NB T	D	D	D	D	D	D
	NB R	A	A	A	A	A	A
	SB L	E	E	E	F (119.9)	F (122.3)	F (122.3)
	SB T/R	D	D	D	D	D	D
	<b>ILOS</b>	<b>C (29.1)</b>	<b>C (32.1)</b>	<b>C (33.3)</b>	<b>C (33.9)</b>	<b>C (34.4)</b>	<b>C (34.7)</b>
Schuylkill Road (SR 0023) & Right-In/Right-Out Site Driveway	NB R	--	--	B	--	--	B
	<b>ILOS</b>	--	--	<b>A (0.1)</b>	--	--	<b>A (0.2)</b>
Kimberton Road (SR 0113) & Site Driveway	EB L/R	--	--	C	--	--	B
	NB L	--	--	A	--	--	A
	<b>ILOS</b>	--	--	<b>A (0.4)</b>	--	--	<b>A (0.9)</b>

*Base = No-Build, Projected = Build*

As shown in **Table 9**, under the 2026 projected conditions with the development of the proposed site, the study area intersections will operate at the same overall intersection level of service (ILOS) as under the 2026 base conditions during the weekday P.M. and Saturday midday peak hours.

All levels of service at the study area intersection comply with the requirement outlined in PennDOT's TIS Guidelines.

## 95<sup>TH</sup> PERCENTILE QUEUE ANALYSIS

Queue analyses were conducted at the study area intersections using *Synchro* software. For this analysis, the 95<sup>th</sup> percentile queue is defined as the queue length that is exceeded in 5% of the signal cycles. As an example, for a signal with a 90-second cycle, this means that the 95<sup>th</sup> percentile queue length will be exceeded during 2 of the 40 signal cycles that occur during the peak hour. The queue analysis results are summarized in **Table 11** for the analyzed peak hours.

**TABLE 11**  
**95<sup>TH</sup> PERCENTILE QUEUE ANALYSIS**

Intersection	Movement	Available Storage	95 <sup>th</sup> Percentile Queues			
			Weekday P.M. Peak Hour		Saturday Midday Peak Hour	
			Base	Projected	Base	Projected
Schuylkill Road/ Nutt Road (SR 0023) & Kimberton Road (SR 0113)	EB L	185	<25	<25	25	25
	EB T/R	550	288	295	288	300
	WB L	TWLTL	150	163	135	158
	WB T	650 <sup>1</sup>	558	553	468	455
	WB R	175	35	35	50	50
	NB L	TWLTL	193	230	123	155
	NB T	600+	210	210	183	183
	NB R	325	<25	<25	<25	<25
	SB L	160	135	135	240	240
	SB T/R	300+	195	195	248	248
Schuylkill Road (SR 0023) & Right-In/Right-Out Site Driveway	NB R	--	<25	<25	<25	<25
Kimberton Road (SR 0113) & Site Driveway	EB L/R	--	<25	<25	<25	<25
	NB L	100+	<25	<25	<25	<25

*Base = No-Build, Projected = Build*  
<sup>1</sup> Approximate distance to Paradise Street

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

### On-Site Queue Analysis

As requested by the Borough's Traffic Engineer, Bowman, peak period queuing data was collected at four (4) existing Flagship Car Wash sites in Maryland and Virginia that have similar characteristics to the proposed site. The vehicle queuing approaching the pay station and queuing between the wash tunnel and the pay station were observed on 5-minute intervals during the weekday evening (3:00-7:00 P.M.) and Saturday midday (10:00 A.M.-3:00 P.M.) time periods. **Table 12** summarizes the peak queuing of each site and calculates an average queue. Additional details regarding the queuing data are in a memo included in **Appendix E**.

**TABLE 12**  
**CAR WASH QUEUEING**

Location	Size (ksf)	Weekday PM Peak (between 3-7 PM)			Saturday Midday Peak (between 10 AM-3 PM)		
		Pay Station Queue	Pay to Tunnel Queue	Total Queue	Pay Station Queue	Pay to Tunnel Queue	Total Queue
Bowie, MD	12.871	4	2	6	16	3	19
Waldorf, MD	15.842	16	4	20	15	4	19
Gainesville, VA	11.255	7	3	10	10	3	13
Herndon, VA	10.992	2	2	4	5	5	10
<b>Average</b>	---	<b>7</b>	<b>3</b>	<b>10</b>	<b>12</b>	<b>4</b>	<b>16</b>

As shown in **Table 12**, the maximum total queuing observed during the peak periods was 20 vehicles, with an average peak queue of 16 vehicles occurring during the Saturday midday peak. Based on the observations, the car wash tunnel operations/speed appeared to control the total queuing.

Per the BL Companies site plan for the site, 10 vehicles are shown a stacking approaching the pay station. In addition, there is staking area between the pay station and the entrance for the car wash tunnel to accommodate 7 vehicles, or a 17 total vehicles in the queue shown on the site plan. Furthermore, there is additional area on-site to accommodate 3 or more vehicles in the queue without extending to Schuylkill Road/Nutt Road. TPD recommends that Flagship monitor the on-site queuing, and assign staff to direct on-site motorists should the queue approach capacity.

## AUXILIARY TURN LANE ANALYSIS

TPD evaluated auxiliary turn lane warrants at the proposed site driveways. The warrant analysis was conducted according to the methodologies contained in Chapter 11 of PennDOT's *Publication 46* and Strike-Off Letter 470-08-07. **Table 13** summarizes the results of the auxiliary turn lane analysis at the site access intersections.

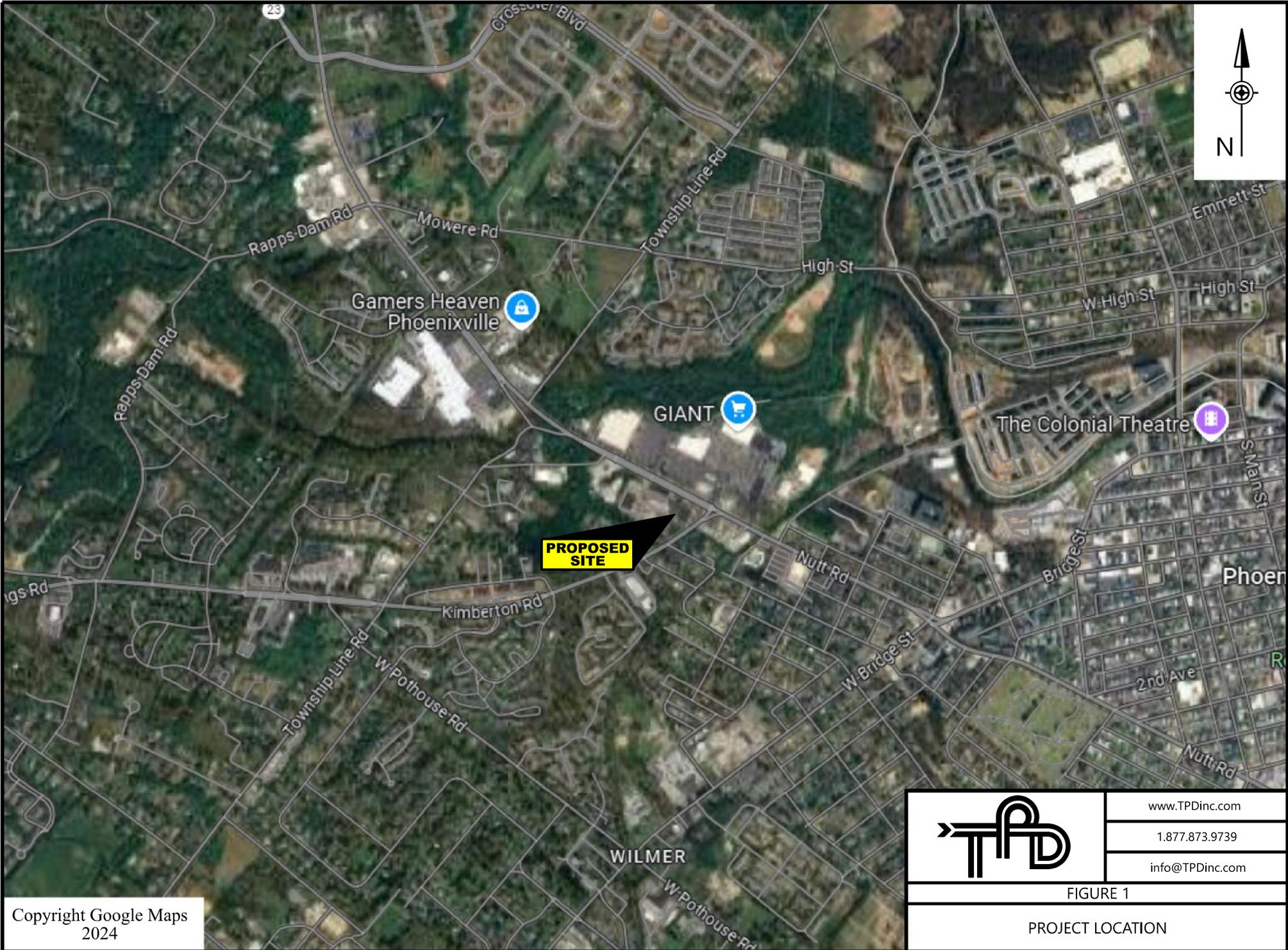
**TABLE 13**  
**AUXILIARY TURN LANE ANALYSIS SUMMARY**

Intersection	Auxiliary Lane	Warrant Satisfied?	Required Lane Length	Proposed Lane Length
Schuylkill Road (SR 0023) Site Driveway	EB Right-Turn Lane	No	--	--
Kimberton Road (SR 0113) Site Driveway	NB Left-Turn Lane	Yes	75'	TWLTL Exists
	SB Right-Turn Lane	No	--	--

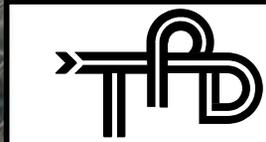
The calculations for the auxiliary turn lane warrants are included in **Appendix I**.

## RECOMMENDATIONS & CONCLUSIONS

The recommendations and conclusions are noted in the Executive Summary of this report.



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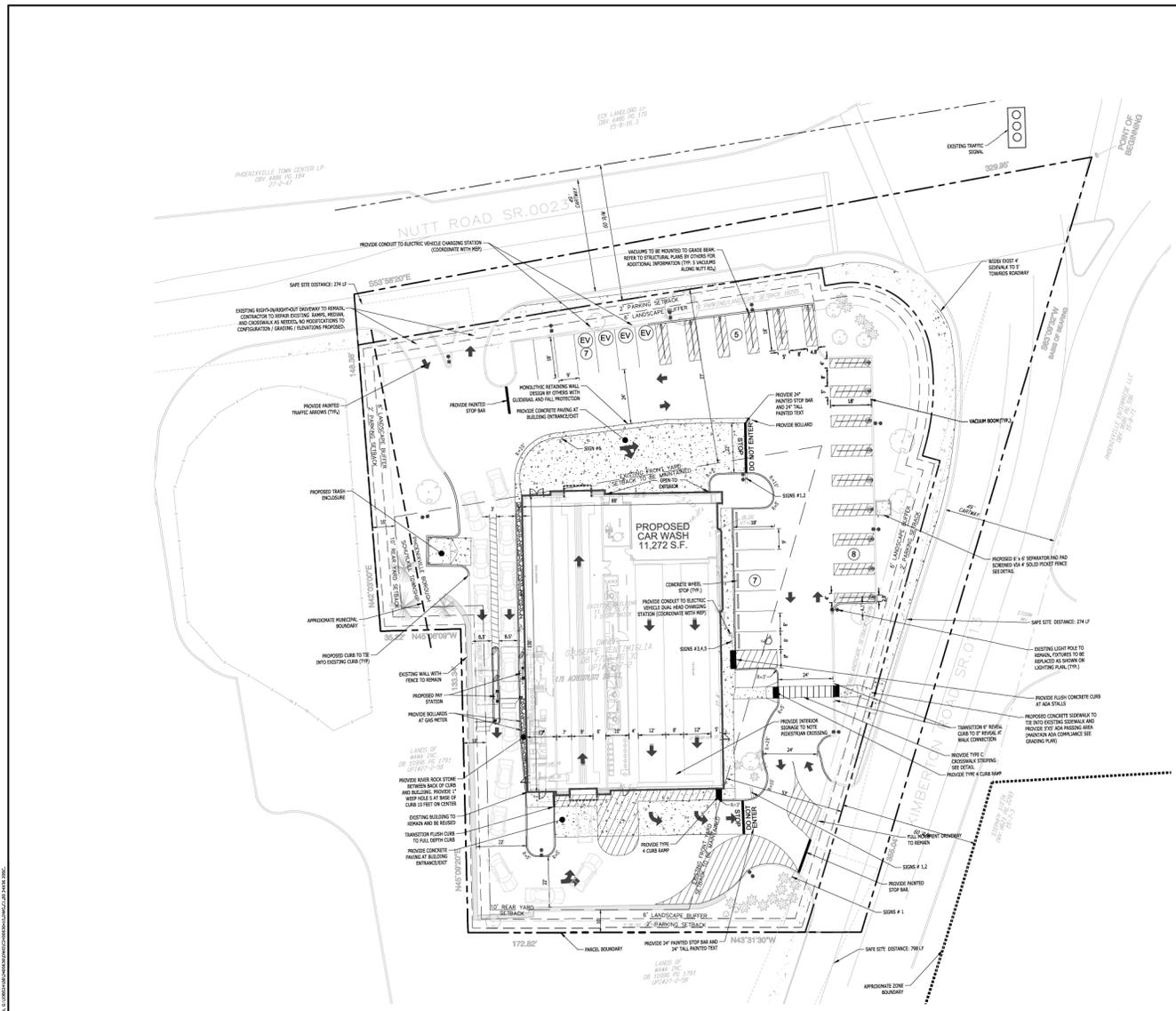
FIGURE 1  
PROJECT LOCATION

### SITE PLAN LEGEND

- PROPERTY LINE
- MUNICIPAL BOUNDARY
- ZONE BOUNDARY
- PROPOSED CURBING
- PROPOSED CONCRETE
- PROPOSED DECK ROCK STONE
- PROPOSED RETAINING WALL
- PROPOSED SIGN
- PROPOSED VACUUM BODY
- PROPOSED ROLLAD
- EXISTING LIGHT POLE
- PROPOSED BUILDING MOUNTED LIGHT
- PROPOSED TRAFFIC ARROWS
- PARKING COUNT

### SIGN LEGEND

SIGN NO.	FIELD NO., SIGN NAME AND SIZE	LEGEND
1	8'x11' STOP SIGN, 30"X30"	
2	8'x11' DO NOT ENTER SIGN, 30"X30"	
3	8'x14' RESERVED PARKING, 32"X32"	
4	8'x14' VOLUNTARY, 32"X32"	
5	8'x14' VEH. VEH. ACCESSIBLE, 32"X32"	
6	8'x14' CHEVRON RIGHT TURN, 32"X32"	



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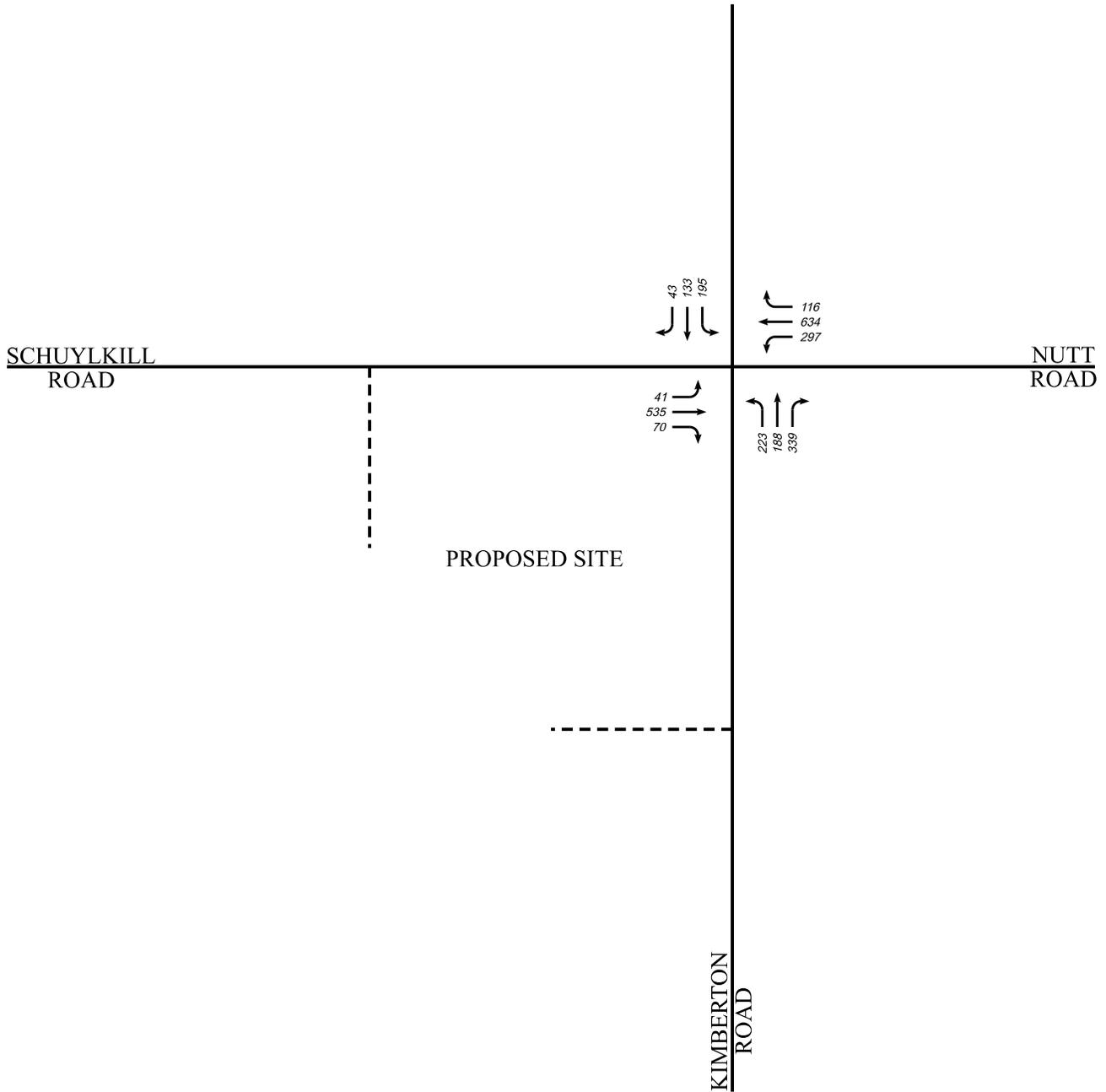
1.877.873.9739

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FIGURE 2

SITE PLAN

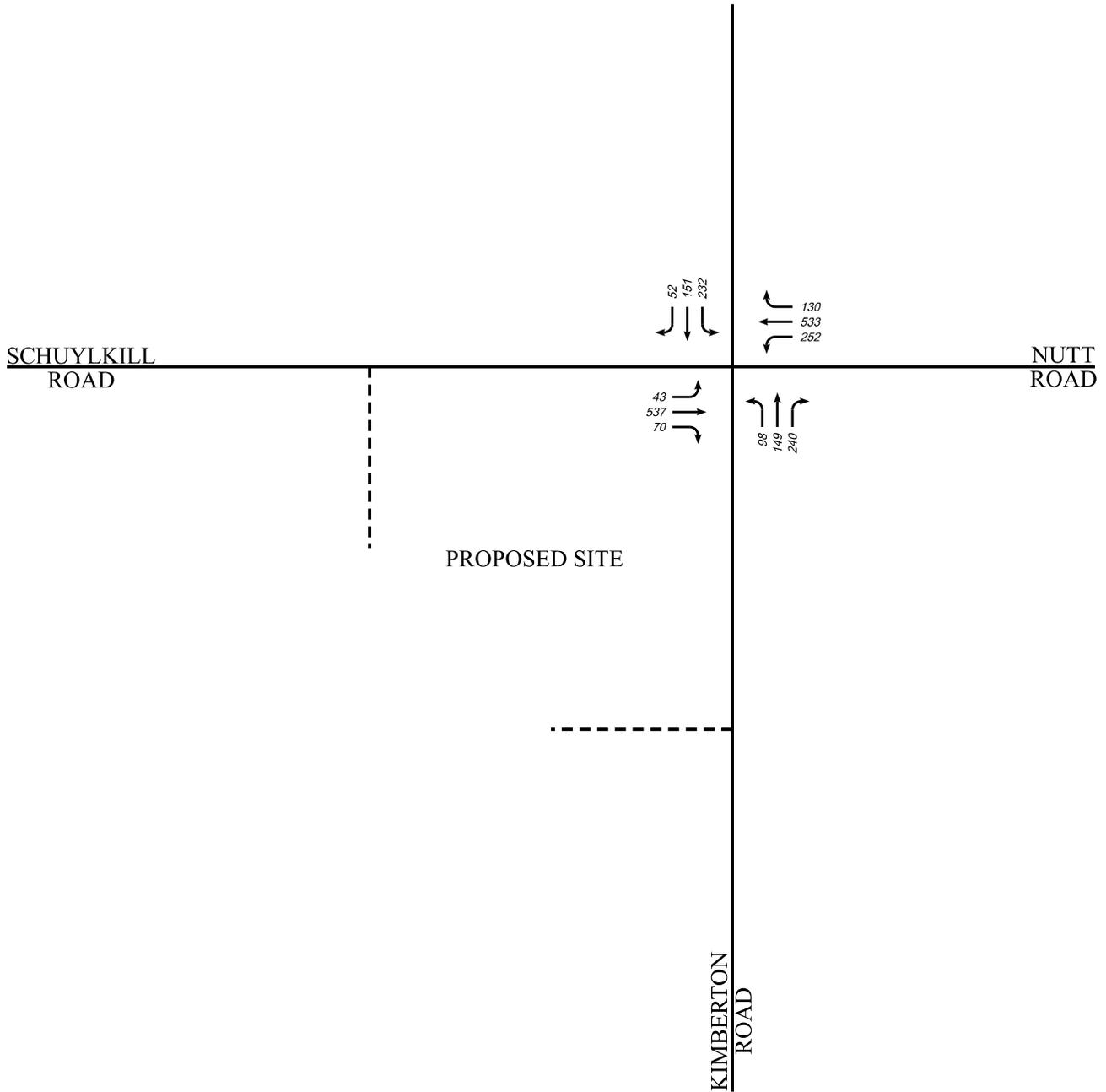
PHOENIXVILLE  
TOWN CENTER



**KEY:**  
 ----- PROPOSED DRIVEWAY  
 SCHEMATIC DRAWING: NOT TO SCALE

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<b>FIGURE 3</b> EXISTING CONDITION WEEKDAY P.M. PEAK HOUR VEHICULAR TRAFFIC VOLUMES		

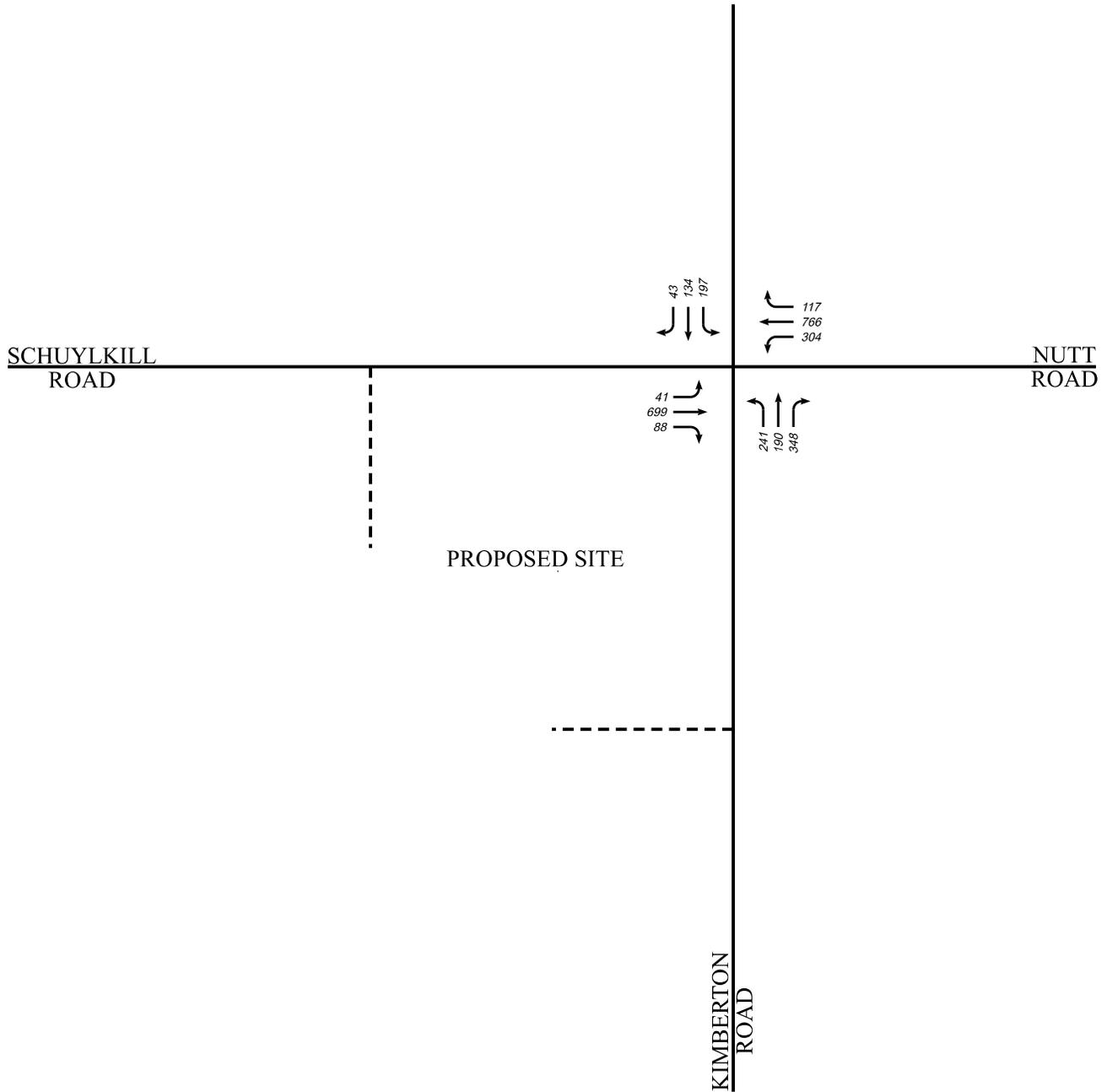
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**KEY:**  
 ----- PROPOSED DRIVEWAY  
 SCHEMATIC DRAWING: NOT TO SCALE

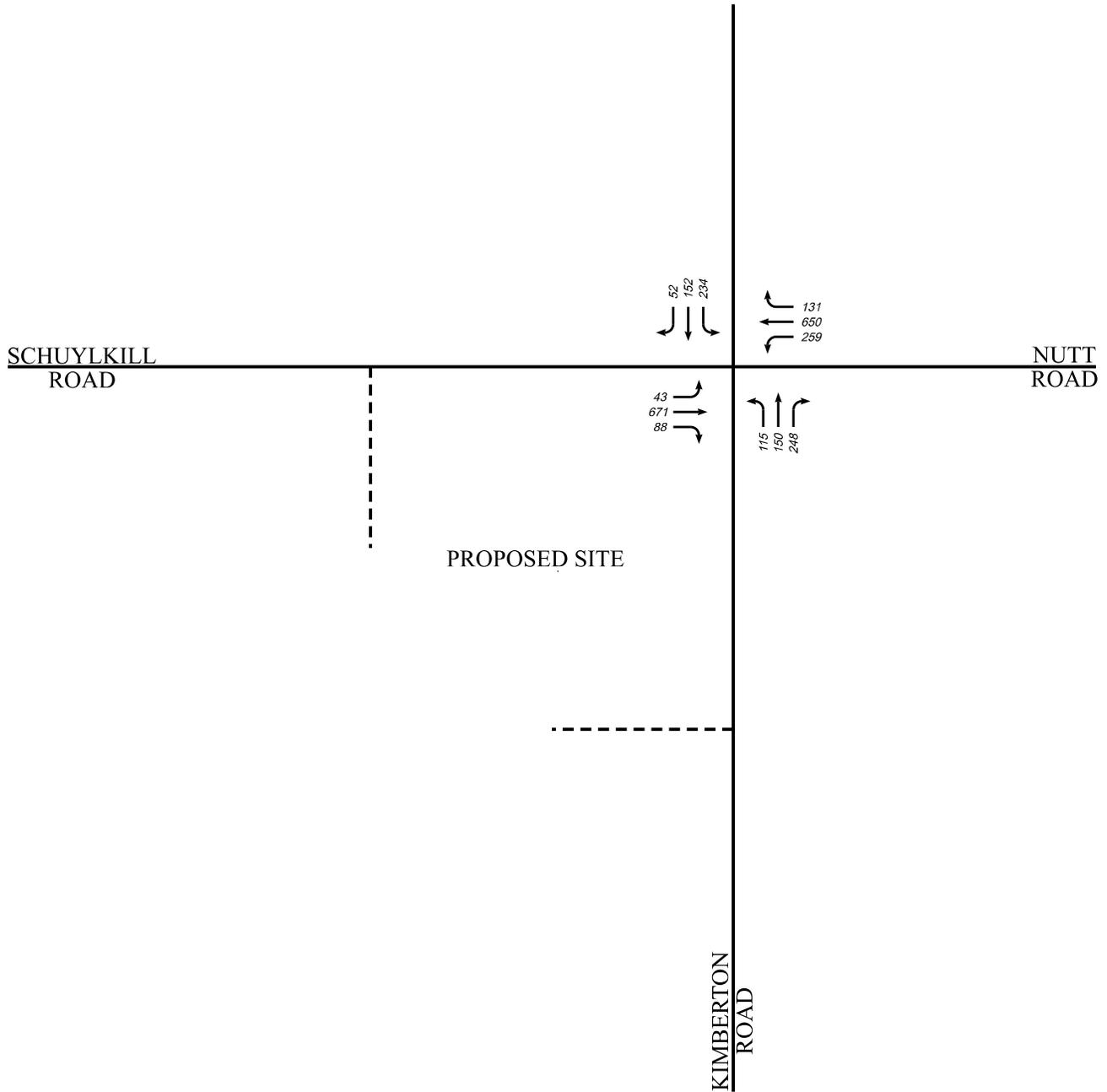
		www.TPDinc.com
		1.877.873.9739
		info@TPDinc.com
FIGURE 4		
EXISTING CONDITION SATURDAY MIDDAY PEAK HOUR VEHICULAR TRAFFIC VOLUMES		

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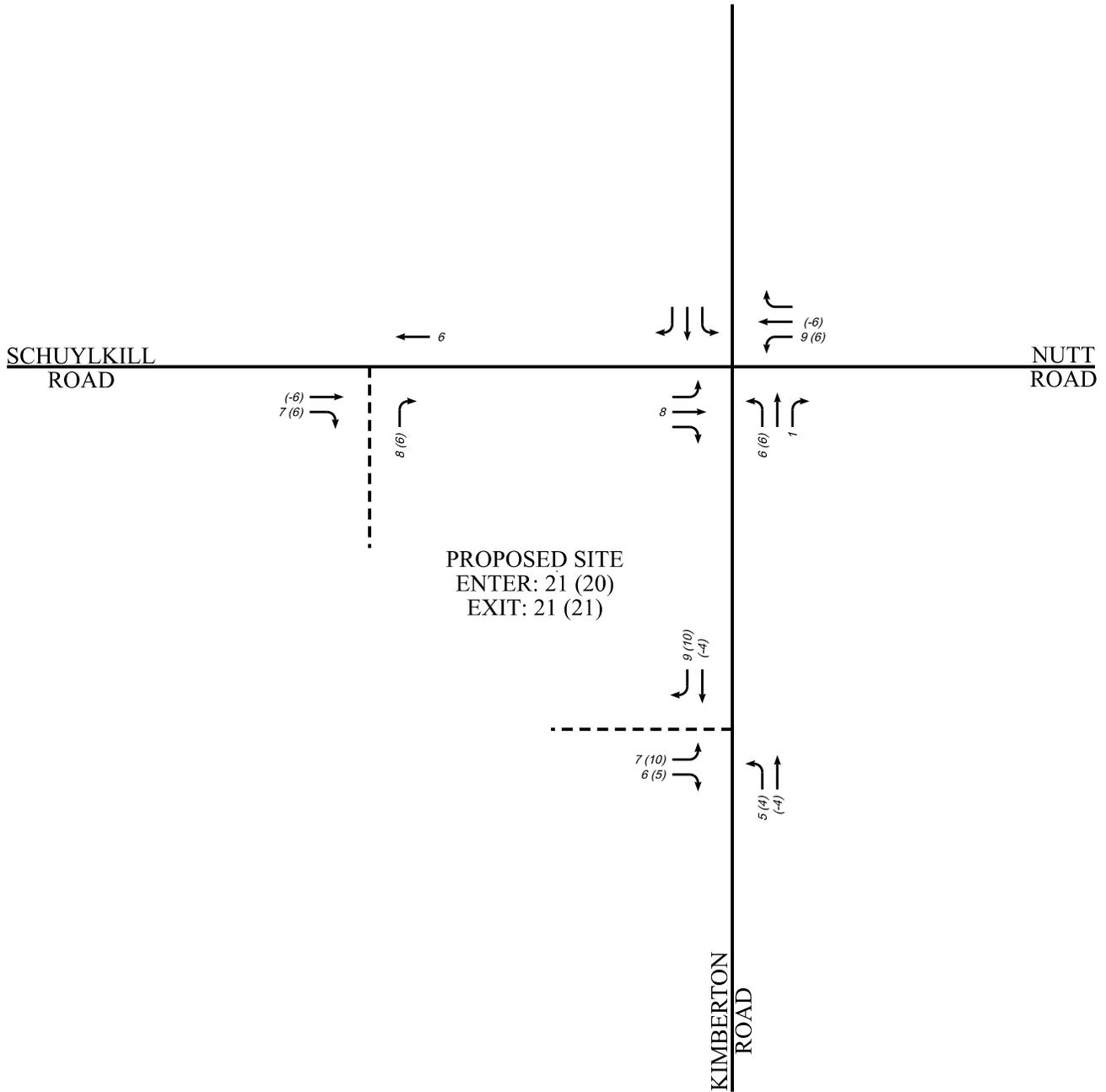
		www.TPDinc.com
		1.877.873.9739
		info@TPDinc.com
FIGURE 5		
2026 BASE (NO-BUILD) CONDITION WEEKDAY P.M. PEAK HOUR VEHICULAR TRAFFIC VOLUMES		

PHOENIXVILLE  
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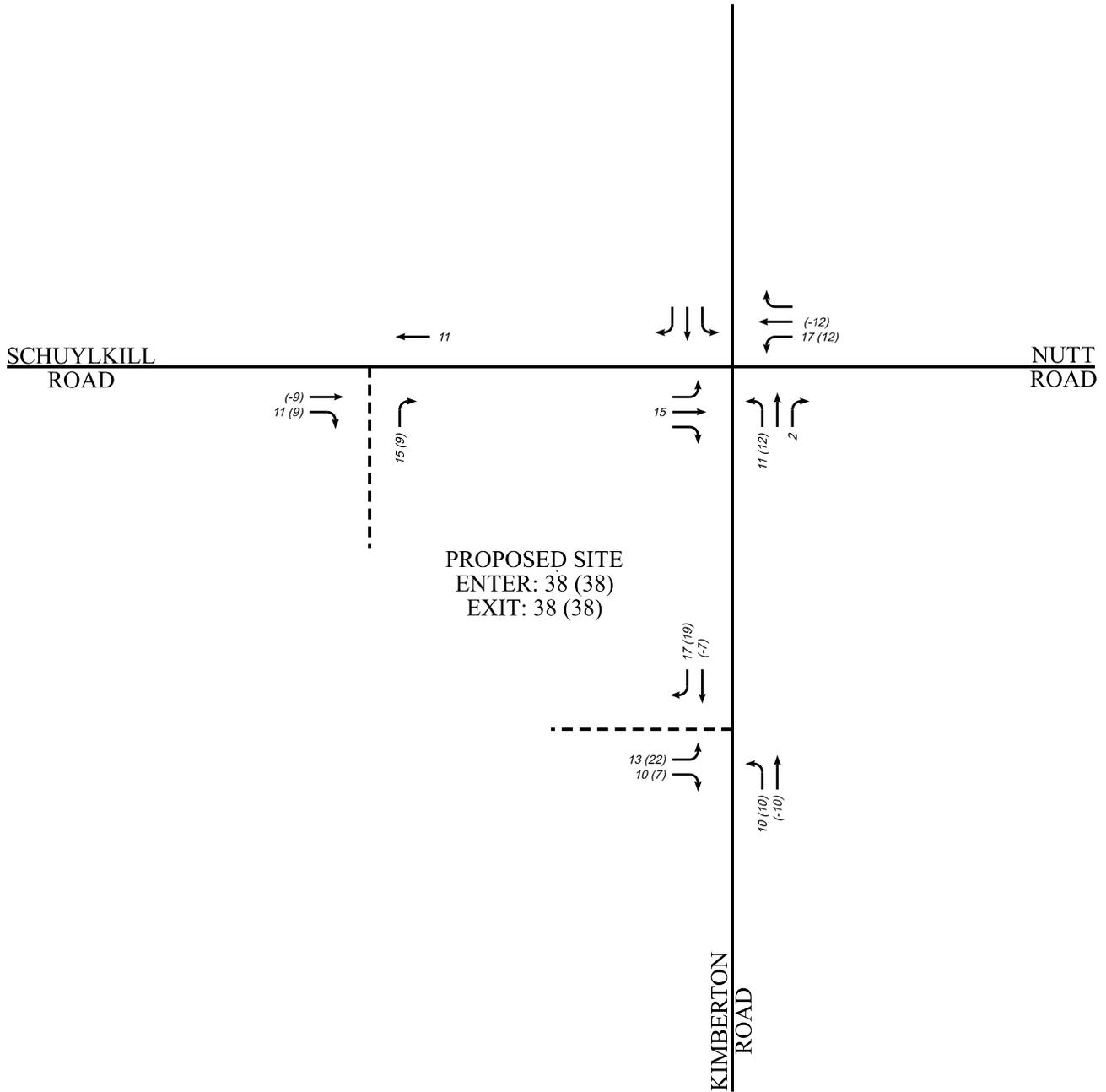
		www.TPDinc.com
		1.877.873.9739
		info@TPDinc.com
FIGURE 6		
2026 BASE (NO-BUILD) CONDITION SATURDAY MIDDAY PEAK HOUR VEHICULAR TRAFFIC VOLUMES		

PHOENIXVILLE  
TOWN CENTER



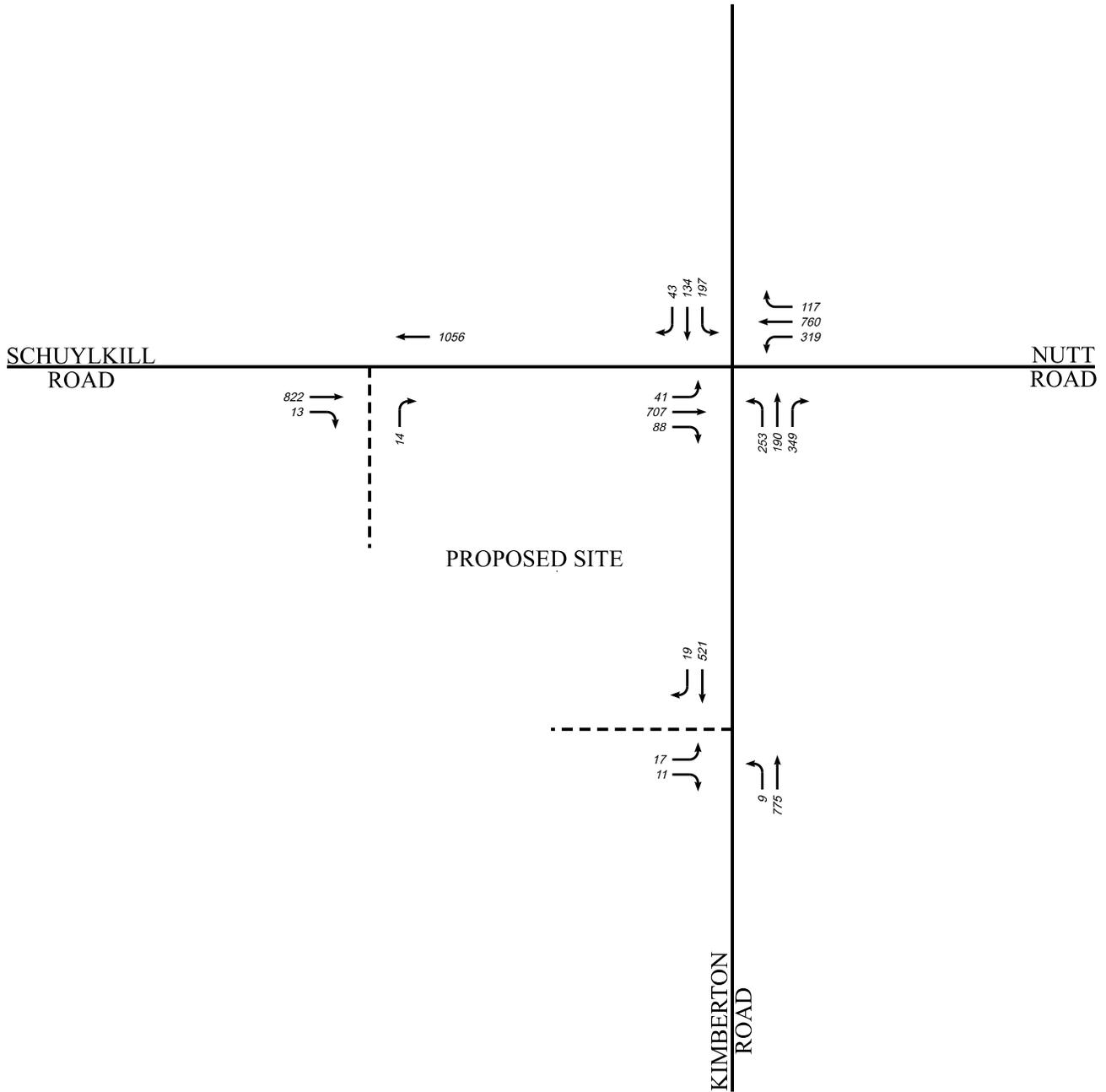
		www.TPDinc.com
		1.877.873.9739
		info@TPDinc.com
FIGURE 7		
SITE TRIPS WEEKDAY P.M. PEAK HOUR		

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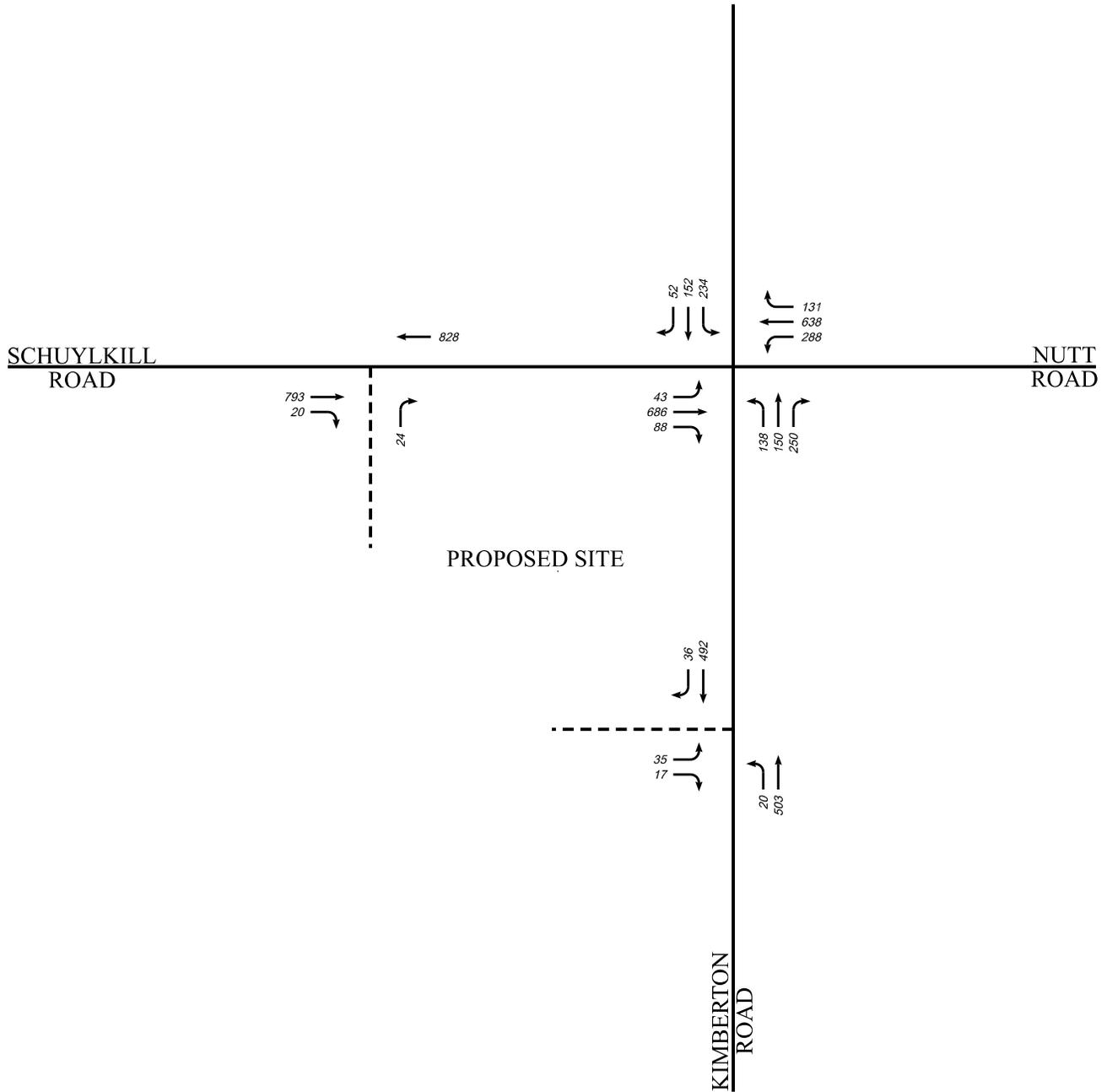
		www.TPDinc.com
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		info@TPDinc.com
FIGURE 8		
SITE TRIPS SATURDAY MIDDAY PEAK HOUR		

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FIGURE 9		
2026 PROJECTED (BUILD) CONDITION WEEKDAY P.M. PEAK HOUR VEHICULAR TRAFFIC VOLUMES		

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FIGURE 10		
2026 PROJECTED (BUILD) CONDITION SATURDAY MIDDAY PEAK HOUR VEHICULAR TRAFFIC VOLUMES		

# APPENDIX A: Project Correspondence





**December 18, 2024**

Mr. E. Jean Krack, Manager  
Phoenixville Borough  
351 Bridge Street, 2<sup>nd</sup> Floor  
Phoenixville, PA 19460

**RE: Response to the Borough's 11/27/24 Traffic Review**

Spotless Car Wash Redevelopment  
*Phoenixville Borough, Chester County*  
TPD Job #BLC.00149

Dear Mr. Krack:

This letter pertains to the proposed Spotless Car Wash redevelopment on the southwest corner of the intersection of Kimberton Road (S.R. 0113) and Nutt Road (S.R. 0023) in Phoenixville Borough, Chester County. TPD has prepared this response letter to address the Traffic Impact Assessment (TIA) review comments prepared by Bowman on behalf of the Borough, dated November 27, 2024 (attached for reference). For the discussion below, the review comments are shown in *italics*, with TPD's responses shown in **bold** type.

**TRAFFIC IMPACT ASSESSMENT COMMENTS**

- 1. The traffic study estimates the trip generation for the site based on data contained in the ITE publication Trip Generation Manual, 11<sup>th</sup> Edition for the Automated Car Wash land use (ITE Land Use Code 948), and assumes the proposed site is 5,000 square feet. It is noted that the original traffic evaluation prepared for the site (dated July 10, 2024) also uses this trip generation methodology. However, the proposed car wash is 11,272 square feet, and the trip generation using the full size of the building would result in more than double the trip generation assumed in the study. According to the applicant's traffic engineer, using the full size of the proposed site would present an unrealistically high trip generation for the site. As noted in our October 7, 2024 traffic study scope memo, the trip generation for the site should be revised based on traffic counts conducted at existing Spotless Car Wash facilities in order to capture the trip generation characteristics of the proposed use. It is our understanding that the applicant's engineer is in the process of conducting the trip generation studies at other facilities.*

**Response: The TIA has been revised utilizing Spotless/Flagship Car Wash specific trip generation data. Please note, this trip generation data resulted in 6 additional new trips during the weekday P.M. peak hour when compared to previously submitted TIA. The Spotless/Flagship Car Wash specific trip generation data resulted in an identical trip generation during the Saturday midday peak hour when compared to previously submitted TIA.**

- 2. The traffic study assumes 50% of the traffic generated by the site will be pass-by traffic; however, ITE does not provide any published data for the Automated Car Wash land use (ITE Land Use Code 948). We believe that it is logical to assume a portion of the trips generated by the site will be pass-by trips due to the convenience nature of the land use, and it is our experience that PennDOT has approved the use of a*

50% pass-by rate for car wash land uses in the pass.

**Response: So noted. The 50% pass-by rate for the car wash use has been reviewed/accepted by PennDOT for other applications.**

3. *The traffic study includes an evaluation of the drive-through queuing within the site based on the methodology contained in Chapter 19 of the 2010 Highway Capacity Manual, and based on this evaluation, the maximum expected queues for the drive-through lanes will be two vehicles (approximately 50 feet) during the weekday afternoon peak hour and four vehicles (approximately 100 feet) during the Saturday midday peak hour. These estimated queues will fit within the storage area between the car wash tunnel and the point of sales, which provides space approximately six to seven vehicles. Further, we note:*
  - a. *As outlined in our October 7, 2024 scoping review memo, the applicant should verify the estimated queues noted above based on queuing observations at existing Spotless Car Wash locations to determine the actual peak queuing conditions. In addition, separate queuing observations should be provided for the entrance to the car wash tunnel, as well as from the point of sale as appropriate.*
  - b. *The applicant may need to provide mitigation measures to prevent queues spilling back onto adjacent roadways or disrupting on-site operations.*

**Response: The TIA has been revised to include Spotless/Flagship Car Wash specific queuing data.**

4. *Based on the results of the traffic study, mitigation improvements are not required to accommodate the traffic generated by the proposed site with regard to capacity and vehicular delays. However, this should be verified based on the trip generation counts requested in comment 1.*

**Response: The TIA has been revised based on the Spotless/Flagship Car Wash specific trip generation data.**

5. *The traffic study indicates a dedicated 75-foot long left-turn lane is warranted at the full movements Route 113 site access. It is noted that in the vicinity of this access, Route 113 provides a center two-way left-turn lane which connects the dedicated northbound Route 113 left-turn lane at Route 23, and the dedicated southbound Route 113 left-turn lane at the Pennsylvania Avenue/Wawa/CVS access. The need to restripe the two-way center left-turn lane in the vicinity of the full-movement site access should be discussed with PennDOT and should be based on a reevaluation of the left-turn lane warrants based on the trip generation counts noted in comment 1.*

**Response: So noted.**

6. *We recommend the existing All Traffic Must Turn Right (R3-7R) sign at the Route 23 right-in/right-out site access should be replaced with a No Left-Turn (R3-2) sign. In addition, a No Left-Turn (R32) sign should also be provided on the westbound Route 23 approach to this intersection to restrict the entering left-turn movement.*

**Response: So noted.**

7. *The existing driveways for the site are located long State Road (S.R. 0113 and S.R. 0023). The applicant should verify with PennDOT whether updated Highway Occupancy Permit applications are required as part of the redevelopment.*

**Response: So noted.**

8. *The applicant should verify the ADA compliance of the existing curb ramps across the existing site driveways. Based on our review, it appears that at a minimum, the pork chop island at the right-in/right-out access along S.R. 0023 does not provide ADA compliant ramps.*

**Response: So noted.**

We hope that these responses are helpful. If you require any additional information, please feel free to contact us.

Sincerely,

**TPD**

A handwritten signature in blue ink, appearing to read "Guido W. DiMartino", with a long horizontal flourish extending to the right.

Guido W. DiMartino, P.E.

*Regional Leader – Transportation Planning*

Attachment: 11/27/2024 Bowman Review

November 27, 2024

Mr. E. Jean Krack, Manager  
Phoenixville Borough  
351 Bridge Street, 2<sup>nd</sup> Floor  
Phoenixville, PA 19460

**RE: Traffic Review | Spotless Car Wash Redevelopment  
Phoenixville Borough, Chester County, Pennsylvania  
Bowman Project No: 310120-24-001**

Dear Mr. Krack:

As requested, Bowman has completed a review of the proposed Spotless Car Wash redevelopment proposed on the southwest corner of the intersection of Kimberton Road (S.R. 0113) and Nutt Road (S.R. 0023). The site currently contains a vacant Rite Aid pharmacy with drive-through, with access provided via a full movement access along Kimberton Road (S.R. 0113) and a right-in/right-out only access along Nutt Road (S.R. 0023). The existing Rite Aid is proposed to be replaced by a 11,272 automated car wash, with access provided via the existing site accesses, with no new accesses proposed as part of the redevelopment. Our review is based on the following document:

1. Spotless Car Wash Transportation Impact Study, Prepared by TPD, and dated October 10, 2024.

Based on our review of the above documents, we offer the following comments, which are based on SALDO Section 22-600.

1. The traffic study estimates the trip generation for the site based on data contained in the ITE publication Trip Generation Manual, 11<sup>th</sup> Edition for the Automated Car Wash land use (ITE Land Use Code 948), and assumes the proposed site is 5,000 square feet. It is noted that the original traffic evaluation prepared for the site (dated July 10, 2024) also uses this trip generation methodology. However, the proposed car wash is 11,272 square feet, and the trip generation using the full size of the building would result in more than double the trip generation assumed in the study. According to the applicant's traffic engineer, using the full size of the proposed site would present an unrealistically high trip generation for the site. As noted in our October 7, 2024 traffic study scope memo, the trip generation for the site should be revised based on traffic counts conducted at existing Spotless Car Wash facilities in order to capture the trip generation characteristics of the proposed use. It is our understanding that the applicant's engineer is in the process of conducting the trip generation studies at other facilities.
2. The traffic study assumes 50% of the traffic generated by the site will be pass-by traffic; however, ITE does not provide any published data for the Automated Car Wash land use (ITE Land Use Code 948). We believe that it is logical to assume a portion of the trips generated by the site will be pass-

by trips due to the convenience nature of the land use, and it is our experience that PennDOT has approved the use of a 50% pass-by rate for car wash land uses in the pass.

3. The traffic study includes an evaluation of the drive-through queuing within the site based on the methodology contained in Chapter 19 of the 2010 Highway Capacity Manual, and based on this evaluation, the maximum expected queues for the drive-through lanes will be two vehicles (approximately 50 feet) during the weekday afternoon peak hour and four vehicles (approximately 100 feet) during the Saturday midday peak hour. These estimated queues will fit within the storage area between the car wash tunnel and the point of sales, which provides space approximately six to seven vehicles. Further, we note:
  - a. As outlined in our October 7, 2024 scoping review memo, the applicant should verify the estimated queues noted above based on queuing observations at existing Spotless Car Wash locations to determine the actual peak queuing conditions. In addition, separate queuing observations should be provided for the entrance to the car wash tunnel, as well as from the point of sale as appropriate.
  - b. The applicant may need to provide mitigation measures to prevent queues spilling back onto adjacent roadways or disrupting on-site operations.
4. Based on the results of the traffic study, mitigation improvements are not required to accommodate the traffic generated by the proposed site with regard to capacity and vehicular delays. However, this should be verified based on the trip generation counts requested in comment 1.
5. The traffic study indicates a dedicated 75-foot long left-turn lane is warranted at the full-movements Route 113 site access. It is noted that in the vicinity of this access, Route 113 provides a center two-way left-turn lane which connects the dedicated northbound Route 113 left-turn lane at Route 23, and the dedicated southbound Route 113 left-turn lane at the Pennsylvania Avenue/Wawa/CVS access. The need to restripe the two-way center left-turn lane in the vicinity of the full-movement site access should be discussed with PennDOT and should be based on a re-evaluation of the left-turn lane warrants based on the trip generation counts noted in comment 1.
6. We recommend the existing All Traffic Must Turn Right (R3-7R) sign at the Route 23 right-in/right-out site access should be replaced with a No Left-Turn (R3-2) sign. In addition, a No Left-Turn (R3-2) sign should also be provided on the westbound Route 23 approach to this intersection to restrict the entering left-turn movement.
7. The existing driveways for the site are located along State Road (S.R. 0113 and S.R. 0023). The applicant should verify with PennDOT whether updated Highway Occupancy Permit applications are required as part of the redevelopment.
8. The applicant should verify the ADA compliance of the existing curb ramps across the existing site driveways. Based on our review, it appears that at a minimum, the pork chop island at the right-in/right-out access along S.R. 0023 does not provide ADA compliant ramps.

**The applicant's engineer should provide an updated traffic study based on the results of the additional trip generation studies as well as a response letter to this review letter. Additional comments may follow based on our review of the additional information.**

If you should have any questions, or require further information, please do not hesitate to reach out to our office.

Sincerely,



John. J. Yurick, P.E., PTOE, PTP  
Senior Project Manager

cc: David Boelker, Director of Planning and Code Enforcement, Phoenixville Borough  
Owen Hyne, PE, CEA, Remington & Vernick Engineers  
Guy DiMartino, PE, Traffic Planning & Design, Inc.

:V:\310120 - Phoenixville PA\310120-24-001 (TRA) - Spotless\Engineering\Correspondence\Reviews\2024-11-20 Review (TIS)\Review\Z-QA\_QC\2024-11-27 Krack Spotless Carwash Review (2024-11-27 JJY QC).docx

**TO:** Jean Krack, Manager  
David Boelker, CZO/BCO, Director of Planning and Code Enforcement  
Guy DiMartino, PE, Traffic Planning and Design, Inc.

**FROM:** John J. Yurick, P.E., PTOE, PTP, Borough Traffic Engineer

**SUBJECT:** Spotless Carwash  
Transportation Impact Study Scoping Memorandum

**DATE:** October 7, 2024

Bowman has prepared this scoping memorandum for the proposed Spotless Carwash redevelopment project at the former Rite-Aid property situated on the northwest corner of the Nutt Road (SR 0023)/Kimberton Road (SR 0113) intersection in Borough of Phoenixville. We preliminarily reviewed the following information provided by the applicant with respect to developing a scope of study:

- Traffic Evaluation, prepared by Traffic Planning and Design, Inc., dated July 10, 2024
- Site Plan, prepared by BL Companies, dated June 12, 2024

Based on our review of the above information, we offer the following recommended Transportation Impact Study Scope:

#### **Study Intersections**

- Nutt Road (SR 0023) and Kimberton Road (SR 0113)
- Nutt Road (SR 0023) and Site Access
- Kimberton Road (SR 0113) and Existing Site Access

#### **Study Peak Periods**

- Weekday afternoon commuter peak period (3:00 PM to 7:00 PM)
- Saturday midday peak period (11:00 AM to 2:00 PM)

#### **Horizon Year**

- Opening Year – since this project is a redevelopment of an existing retail facility, we recommend evaluation of the opening year of the project. The anticipated opening year should consider the typical duration of the permitting and approval process.

#### **Other Development Traffic**

- The buildout of the following projects in the study area should be considered in the future traffic forecasts. Although there are other development projects in the Borough, these projects are most likely to influence traffic volumes in the study area of the proposed project. Trip distribution figures from recent transportation impact studies are attached (as available) for use in the current study.

- Odessa Residential
- Trieste Residential
- Paradise Village Multi-Use
- Steelworks Village Multi-Use
- 348-370 Bridge Street
- Due to the location of the site, please contact East Pikeland Township and Charlestown Township to determine if there are any other significant projects to include.

**Additional Considerations**

- **Crash History** – Provide documentation of the crash histories over the last five-year period for the study intersection and site access driveways.
  
- **Trip Generation and Queuing Information** – available data from existing Spotless Carwash facilities is requested to verify the atypical Trip Generation methodology utilized in the applicant’s prior traffic evaluation. Also, due to the proximity of the Nutt Road site access to the entry lane for the car wash, we recommend consideration of queuing data based on similar facilities, as available.
  
- **Paradise Street/Nutt Road** – intersection improvements are planned that will include a slight realignment of Paradise Street at Nutt Road, a fourth-leg to provide access to the car dealership and apartment complex, lane re-striping, and traffic signalization. Please note that the existing center left-turn lane along Nutt Road will be converted to a 175-foot long separate eastbound left-turn lane at the Paradise Street intersection. Accordingly, the transportation impact study should verify that queues from the Kimberton Road intersection will not interfere with queuing at the improved Paradise Street intersection.
  
- **Additional Report Content** – the transportation impact study should provide a detailed evaluation of the proposed redevelopment traffic impacts and presented in a format consistent with standard practices and applicable PennDOT guidelines.

# APPENDIX B:

## Study Area Photographs





**Direction / Road:** EB Schuylkill Road  
**Approach / Departure:** Approach



**Direction / Road:** WB Nutt Road  
**Approach / Departure:** Approach

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---



**Direction / Road:** NB Kimberton Road  
**Approach / Departure:** Approach



**Direction / Road:** SB Phoenixville Town Center Driveway  
**Approach / Departure:** Approach

# APPENDIX C: Manual Traffic Count Data Sheets





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

Count Name: 1 Kimberton Rd-  
 Shopping Center & Nutt Rd-  
 Schuylkill Rd  
 Site Code:  
 Start Date: 09/28/2024  
 Page No: 1

Counter: MIO:  
 Set up By JH::

### Turning Movement Data

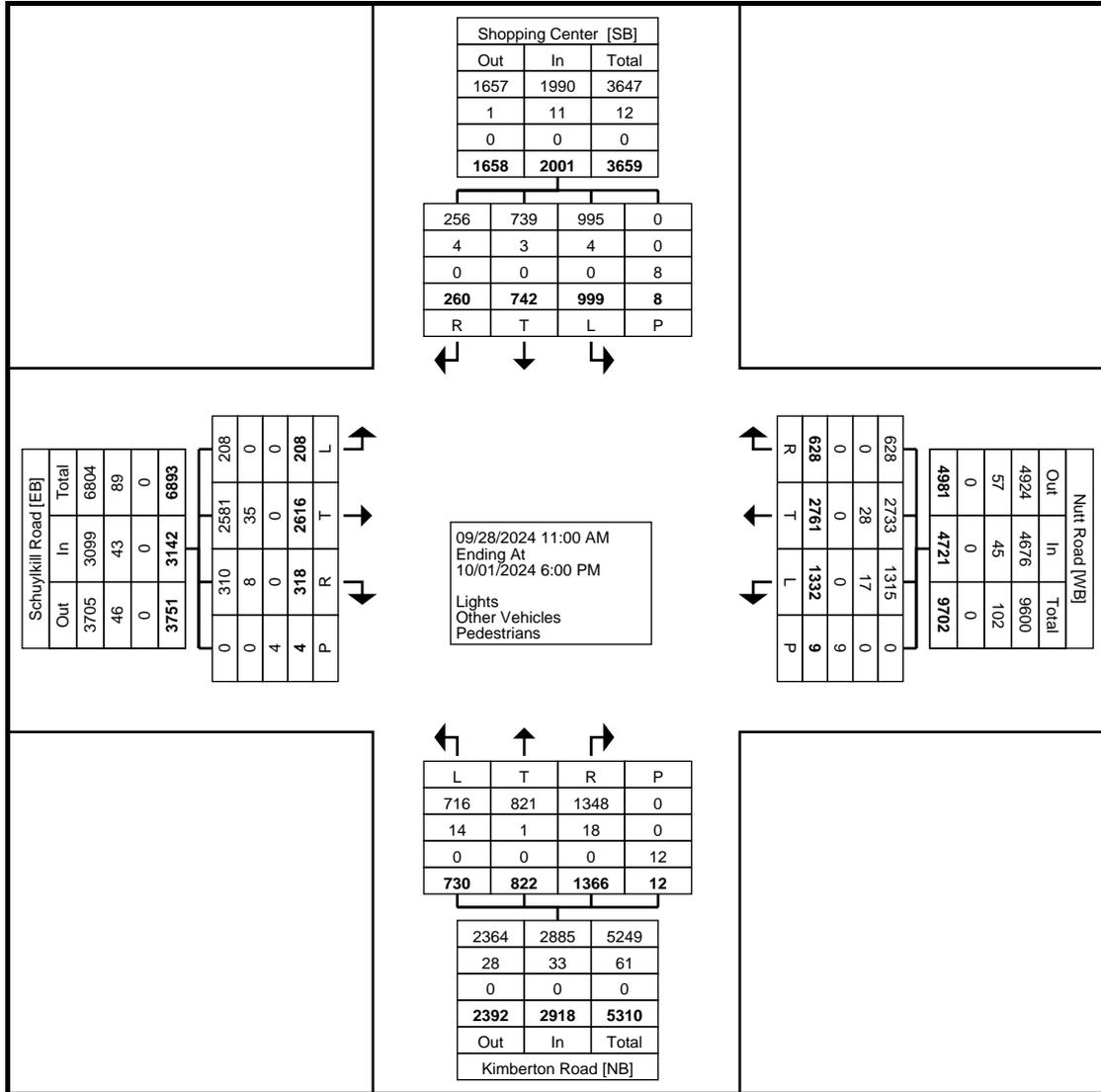
Start Time	Schuylkill Road Eastbound						Nutt Road Westbound						Kimberton Road Northbound						Shopping Center Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
11:00 AM	10	128	14	6	0	158	59	107	23	11	0	200	29	46	31	28	0	134	31	45	15	0	0	91	583
11:15 AM	8	125	13	5	0	151	72	117	23	12	0	224	33	43	39	26	0	141	58	41	10	7	0	116	632
11:30 AM	13	121	4	6	1	144	64	116	28	11	0	219	20	38	30	29	1	117	51	35	6	4	0	96	576
11:45 AM	7	147	13	3	0	170	64	140	25	4	0	233	32	39	45	22	0	138	58	46	7	3	0	114	655
Hourly Total	38	521	44	20	1	623	259	480	99	38	0	876	114	166	145	105	1	530	198	167	38	14	0	417	2446
12:00 PM	16	134	15	4	1	169	62	145	24	14	1	245	17	26	38	22	1	103	52	31	15	0	0	98	615
12:15 PM	11	133	12	3	0	159	68	126	19	10	3	223	21	37	33	20	1	111	55	37	10	1	2	103	596
12:30 PM	9	123	17	3	0	152	58	122	20	14	1	214	28	47	36	24	1	135	67	37	13	3	0	120	621
12:45 PM	15	132	15	7	0	169	62	131	17	16	0	226	28	38	42	21	0	129	48	33	13	1	0	95	619
Hourly Total	51	522	59	17	1	649	250	524	80	54	5	908	94	148	149	87	3	478	222	138	51	5	2	416	2451
1:00 PM	12	145	7	2	0	166	51	128	15	14	0	208	36	48	33	20	0	137	51	29	13	2	0	95	606
1:15 PM	13	112	6	7	0	138	55	118	22	8	0	203	22	38	32	16	0	108	70	52	11	1	1	134	583
1:30 PM	10	122	12	7	0	151	53	144	17	11	0	225	27	43	50	18	0	138	54	40	16	3	0	113	627
1:45 PM	18	146	9	2	0	175	51	136	25	20	0	232	15	39	28	12	3	94	52	48	15	3	0	118	619
Hourly Total	53	525	34	18	0	630	210	526	79	53	0	868	100	168	143	66	3	477	227	169	55	9	1	460	2435
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	7	116	13	2	0	138	49	141	12	13	0	215	56	37	31	40	0	164	43	26	13	0	1	82	599
4:15 PM	4	132	13	0	0	149	99	146	21	6	2	272	41	28	51	37	2	157	33	42	16	2	2	93	671
4:30 PM	8	122	15	1	0	146	92	148	13	10	0	263	54	45	43	48	0	190	37	26	8	0	0	71	670
4:45 PM	6	143	12	0	0	161	76	162	32	2	0	272	48	42	43	39	1	172	44	41	6	0	0	91	696
Hourly Total	25	513	53	3	0	594	316	597	78	31	2	1022	199	152	168	164	3	683	157	135	43	2	3	337	2636
5:00 PM	10	132	18	0	0	160	74	164	19	15	0	272	64	41	30	55	1	190	37	42	10	0	0	89	711
5:15 PM	9	130	13	1	0	153	80	150	13	10	1	253	47	47	30	40	1	164	50	26	7	1	1	84	654
5:30 PM	12	121	17	3	1	153	76	156	19	10	1	261	65	49	51	49	0	214	52	26	10	4	1	92	720
5:45 PM	10	152	15	3	1	180	67	164	17	13	0	261	47	51	35	49	0	182	56	39	9	2	0	106	729
Hourly Total	41	535	63	7	2	646	297	634	68	48	2	1047	223	188	146	193	2	750	195	133	36	7	2	371	2814
Grand Total	208	2616	253	65	4	3142	1332	2761	404	224	9	4721	730	822	751	615	12	2918	999	742	223	37	8	2001	12782
Approach %	6.6	83.3	8.1	2.1	-	-	28.2	58.5	8.6	4.7	-	-	25.0	28.2	25.7	21.1	-	-	49.9	37.1	11.1	1.8	-	-	-
Total %	1.6	20.5	2.0	0.5	-	24.6	10.4	21.6	3.2	1.8	-	36.9	5.7	6.4	5.9	4.8	-	22.8	7.8	5.8	1.7	0.3	-	15.7	-
Lights	208	2581	247	63	-	3099	1315	2733	404	224	-	4676	716	821	742	606	-	2885	995	739	219	37	-	1990	12650
% Lights	100.0	98.7	97.6	96.9	-	98.6	98.7	99.0	100.0	100.0	-	99.0	98.1	99.9	98.8	98.5	-	98.9	99.6	99.6	98.2	100.0	-	99.5	99.0
Other Vehicles	0	35	6	2	-	43	17	28	0	0	-	45	14	1	9	9	-	33	4	3	4	0	-	11	132
% Other Vehicles	0.0	1.3	2.4	3.1	-	1.4	1.3	1.0	0.0	0.0	-	1.0	1.9	0.1	1.2	1.5	-	1.1	0.4	0.4	1.8	0.0	-	0.5	1.0
Pedestrians	-	-	-	-	4	-	-	-	-	-	9	-	-	-	-	-	12	-	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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

Count Name: 1 Kimberton Rd-  
 Shopping Center & Nutt Rd-  
 Schuylkill Rd  
 Site Code:  
 Start Date: 09/28/2024  
 Page No: 2

Counter: MIO:  
 Set up By JH::



Turning Movement Data Plot



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

Count Name: 1 Kimberton Rd-  
 Shopping Center & Nutt Rd-  
 Schuylkill Rd  
 Site Code:  
 Start Date: 09/28/2024  
 Page No: 3

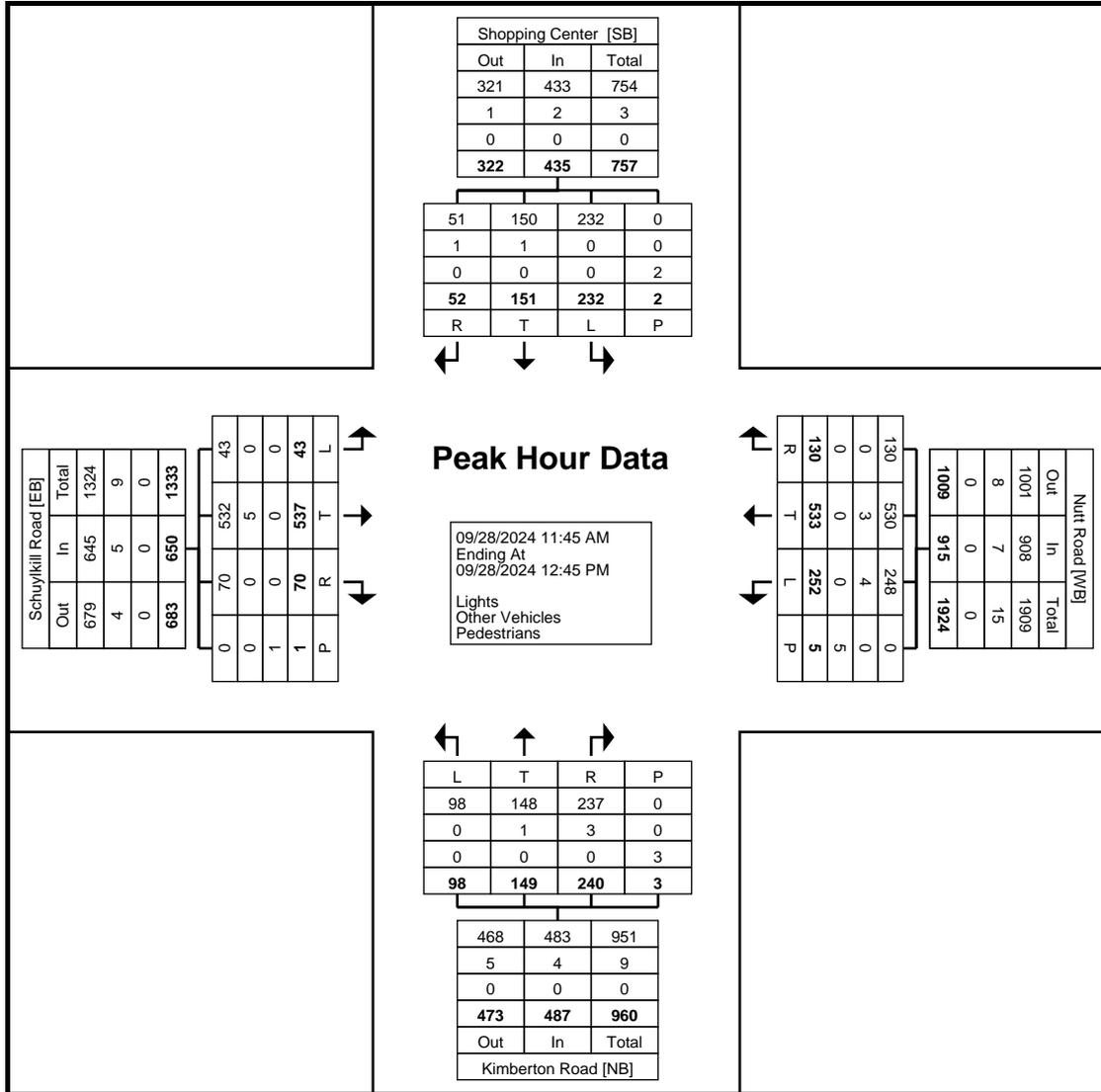
Counter: MIO:  
 Set up By JH::

### Turning Movement Peak Hour Data (11:45 AM)

Start Time	Schuylkill Road Eastbound						Nutt Road Westbound						Kimberton Road Northbound						Shopping Center Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
11:45 AM	7	147	13	3	0	170	64	140	25	4	0	233	32	39	45	22	0	138	58	46	7	3	0	114	655
12:00 PM	16	134	15	4	1	169	62	145	24	14	1	245	17	26	38	22	1	103	52	31	15	0	0	98	615
12:15 PM	11	133	12	3	0	159	68	126	19	10	3	223	21	37	33	20	1	111	55	37	10	1	2	103	596
12:30 PM	9	123	17	3	0	152	58	122	20	14	1	214	28	47	36	24	1	135	67	37	13	3	0	120	621
<b>Total</b>	<b>43</b>	<b>537</b>	<b>57</b>	<b>13</b>	<b>1</b>	<b>650</b>	<b>252</b>	<b>533</b>	<b>88</b>	<b>42</b>	<b>5</b>	<b>915</b>	<b>98</b>	<b>149</b>	<b>152</b>	<b>88</b>	<b>3</b>	<b>487</b>	<b>232</b>	<b>151</b>	<b>45</b>	<b>7</b>	<b>2</b>	<b>435</b>	<b>2487</b>
Approach %	6.6	82.6	8.8	2.0	-	-	27.5	58.3	9.6	4.6	-	-	20.1	30.6	31.2	18.1	-	-	53.3	34.7	10.3	1.6	-	-	-
Total %	1.7	21.6	2.3	0.5	-	26.1	10.1	21.4	3.5	1.7	-	36.8	3.9	6.0	6.1	3.5	-	19.6	9.3	6.1	1.8	0.3	-	17.5	-
PHF	0.672	0.913	0.838	0.813	-	0.956	0.926	0.919	0.880	0.750	-	0.934	0.766	0.793	0.844	0.917	-	0.882	0.866	0.821	0.750	0.583	-	0.906	0.949
Lights	43	532	57	13	-	645	248	530	88	42	-	908	98	148	149	88	-	483	232	150	44	7	-	433	2469
% Lights	100.0	99.1	100.0	100.0	-	99.2	98.4	99.4	100.0	100.0	-	99.2	100.0	99.3	98.0	100.0	-	99.2	100.0	99.3	97.8	100.0	-	99.5	99.3
Other Vehicles	0	5	0	0	-	5	4	3	0	0	-	7	0	1	3	0	-	4	0	1	1	0	-	2	18
% Other Vehicles	0.0	0.9	0.0	0.0	-	0.8	1.6	0.6	0.0	0.0	-	0.8	0.0	0.7	2.0	0.0	-	0.8	0.0	0.7	2.2	0.0	-	0.5	0.7
Pedestrians	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	3	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Counter: MIO:  
 Set up By JH::



Turning Movement Peak Hour Data Plot (11:45 AM)



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

Count Name: 1 Kimberton Rd-  
 Shopping Center & Nutt Rd-  
 Schuylkill Rd  
 Site Code:  
 Start Date: 09/28/2024  
 Page No: 5

Counter: MIO:  
 Set up By JH::

### Turning Movement Peak Hour Data (5:00 PM)

Start Time	Schuylkill Road Eastbound						Nutt Road Westbound						Kimberton Road Northbound						Shopping Center Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
5:00 PM	10	132	18	0	0	160	74	164	19	15	0	272	64	41	30	55	1	190	37	42	10	0	0	89	711
5:15 PM	9	130	13	1	0	153	80	150	13	10	1	253	47	47	30	40	1	164	50	26	7	1	1	84	654
5:30 PM	12	121	17	3	1	153	76	156	19	10	1	261	65	49	51	49	0	214	52	26	10	4	1	92	720
5:45 PM	10	152	15	3	1	180	67	164	17	13	0	261	47	51	35	49	0	182	56	39	9	2	0	106	729
<b>Total</b>	<b>41</b>	<b>535</b>	<b>63</b>	<b>7</b>	<b>2</b>	<b>646</b>	<b>297</b>	<b>634</b>	<b>68</b>	<b>48</b>	<b>2</b>	<b>1047</b>	<b>223</b>	<b>188</b>	<b>146</b>	<b>193</b>	<b>2</b>	<b>750</b>	<b>195</b>	<b>133</b>	<b>36</b>	<b>7</b>	<b>2</b>	<b>371</b>	<b>2814</b>
Approach %	6.3	82.8	9.8	1.1	-	-	28.4	60.6	6.5	4.6	-	-	29.7	25.1	19.5	25.7	-	-	52.6	35.8	9.7	1.9	-	-	-
Total %	1.5	19.0	2.2	0.2	-	23.0	10.6	22.5	2.4	1.7	-	37.2	7.9	6.7	5.2	6.9	-	26.7	6.9	4.7	1.3	0.2	-	13.2	-
PHF	0.854	0.880	0.875	0.583	-	0.897	0.928	0.966	0.895	0.800	-	0.962	0.858	0.922	0.716	0.877	-	0.876	0.871	0.792	0.900	0.438	-	0.875	0.965
Lights	41	530	62	6	-	639	296	629	68	48	-	1041	221	188	142	189	-	740	194	133	35	7	-	369	2789
% Lights	100.0	99.1	98.4	85.7	-	98.9	99.7	99.2	100.0	100.0	-	99.4	99.1	100.0	97.3	97.9	-	98.7	99.5	100.0	97.2	100.0	-	99.5	99.1
Other Vehicles	0	5	1	1	-	7	1	5	0	0	-	6	2	0	4	4	-	10	1	0	1	0	-	2	25
% Other Vehicles	0.0	0.9	1.6	14.3	-	1.1	0.3	0.8	0.0	0.0	-	0.6	0.9	0.0	2.7	2.1	-	1.3	0.5	0.0	2.8	0.0	-	0.5	0.9
Pedestrians	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



# APPENDIX D: Nearby Developments



## Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

### Trip Generation

Traffic volumes generated by the proposed development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 11th Edition*. **Tables 3A and 3B** presents the anticipated vehicular trip generation for the proposed development.

**Table 3A. Trip Generation Methodology**

Land Use	Land Use Code	Daily	Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
			Method	Enter/Exit	Method	Enter/Exit
Townhomes	215	$T = 7.62(X) - 50.48$	$T = 0.52(X) - 5.70$	31%/69%	$T = 0.60(X) - 3.93$	57%/43%
Apartments	221	$T = 4.77(X) - 46.46$	$T = 0.44(X) - 11.61$	23%/77%	$T = 0.39(X) + 0.34$	61%/39%
Retail	822	$T = 42.20(Y) + 229.68$	$T = 2.36(Y)$	60%/40%	$\ln(T) = 0.71$ $\ln(Y) + 2.72$	50%/50%

X = Independent Variable (units) | Y = Independent Variable (uksf) | T = Trips

**Table 3B. Vehicular Trip Generation**

Land Use	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes <sup>(1)</sup>	168 units	1,230	25	57	82	55	42	97
Internal Trips <sup>(2)</sup>		<u>-42</u>	<u>-1</u>	<u>-0</u>	<u>-1</u>	<u>-6</u>	<u>-2</u>	<u>-8</u>
New External Trips		1,188	24	57	81	49	40	89
Apartments <sup>(3)</sup>	224 units	1,022	20	67	87	53	35	88
Internal Trips <sup>(2)</sup>		<u>-35</u>	<u>-0</u>	<u>-1</u>	<u>-1</u>	<u>-6</u>	<u>-2</u>	<u>-8</u>
New External Trips		987	20	66	86	47	33	80
Retail <sup>(4)</sup>	12,000 s.f.	736	17	11	28	44	45	89
Internal Trips <sup>(2)</sup>		<u>-77</u>	<u>-1</u>	<u>-1</u>	<u>-2</u>	<u>-4</u>	<u>-12</u>	<u>-16</u>
External Trips		659	16	10	26	40	33	73
Pass-By Trips <sup>(5)</sup>		<u>-198</u>	<u>-5</u>	<u>-3</u>	<u>-8</u>	<u>-16</u>	<u>-13</u>	<u>-29</u>
New External Trips		461	11	7	18	24	20	44
<b>Total Site Trips</b>	<b>392</b>	<b>2,988</b>	<b>62</b>	<b>135</b>	<b>197</b>	<b>152</b>	<b>122</b>	<b>274</b>
<b>Internal Trips</b>	<b>units</b>	<b><u>-154</u></b>	<b><u>-2</u></b>	<b><u>-2</u></b>	<b><u>-4</u></b>	<b><u>-16</u></b>	<b><u>-16</u></b>	<b><u>-32</u></b>
<b>External Trips</b>	<b>and</b>	<b>2,834</b>	<b>60</b>	<b>133</b>	<b>193</b>	<b>136</b>	<b>106</b>	<b>242</b>
<b>Pass-By Trips</b>	<b>12,000</b>	<b><u>-198</u></b>	<b><u>-5</u></b>	<b><u>-3</u></b>	<b><u>-8</u></b>	<b><u>-16</u></b>	<b><u>-13</u></b>	<b><u>-29</u></b>
<b>New External Site Trips</b>	<b>s.f.</b>	<b>2,636</b>	<b>55</b>	<b>130</b>	<b>185</b>	<b>120</b>	<b>93</b>	<b>213</b>

- (1) (1) ITE Land Use Code 215 for Single Family Attached Housing.
- (2) Based on procedures outlined in the ITE Publication, *Trip Generation Handbook*, 3<sup>rd</sup> Edition.
- (3) ITE Land Use Code 221 for Multifamily Housing (Mid-Rise).
- (4) ITE Land Use Code 822 for Strip Retail Plaza (<40K).
- (5) Estimated to be 40 percent during the weekday afternoon peak hour based on information provided within the ITE publication, ITE Trip Generation, Eleventh Edition appendices for Shopping Plaza (Land Use Code 821). For analysis periods without data, the pass-by rate was assumed to be ten percent less than the weekday afternoon peak hour.

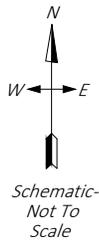
### Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development’s site access. The distribution percentages for the anticipated directions of approach and departure and traffic assignment percentages are illustrated in **Figure 4A**. Application of the percentages illustrated in Figure 4A to the new peak hour trips contained in Table 3B, provides an estimate of site traffic to be added to the study area. The site-generated traffic is also shown in **Figure 4B** for the weekday morning and weekday afternoon peak hours.

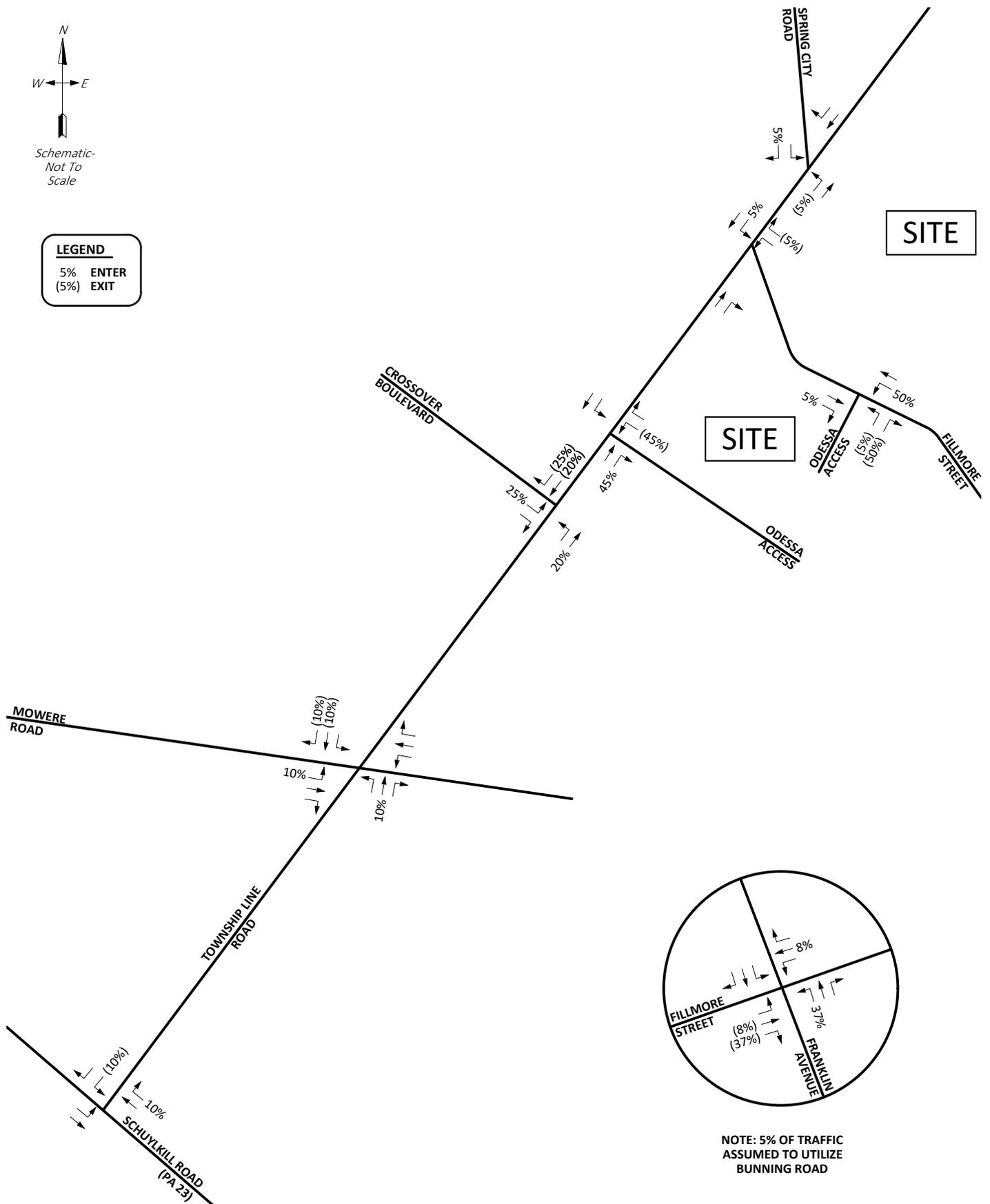
The pass-by trip assignments for the retail portion of the site are illustrated in **Figure 4C** for the weekday morning and weekday afternoon peak hours.

### Site Access Configuration and Traffic Control

Access to the site is proposed via one unsignalized driveway located along Fillmore Street, approximately 1,000 feet southeast of Township Line Road and one unsignalized driveway located along Township Line Road,



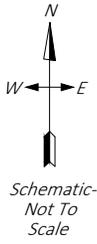
LEGEND	
5%	ENTER
(5%)	EXIT



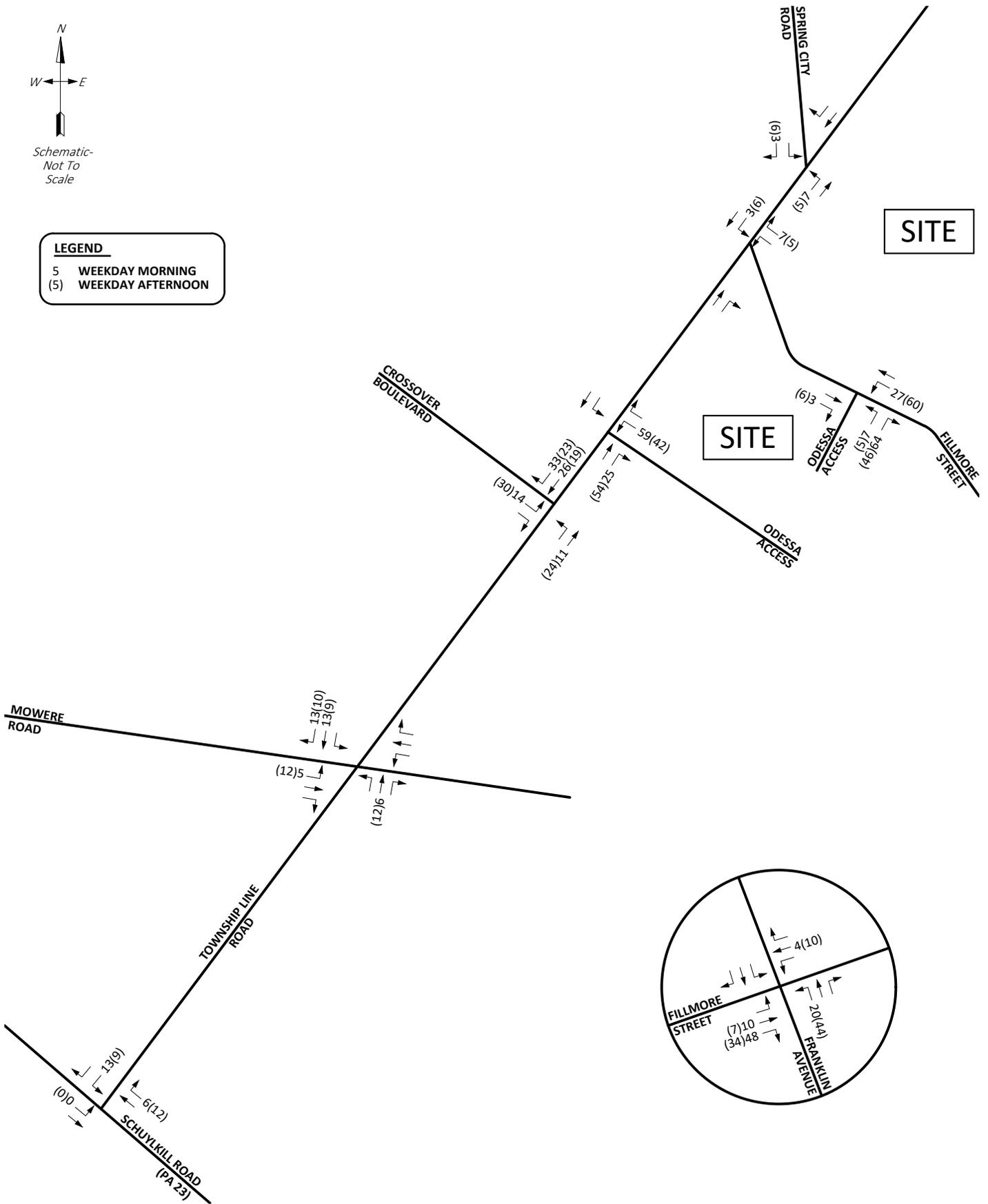
**FIGURE 4A**  
New Site Trip Distribution

**ODESSA**  
BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





LEGEND	
5	WEEKDAY MORNING
(5)	WEEKDAY AFTERNOON



**FIGURE 4B**  
 New Site Trip Assignment  
**ODESSA**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





## Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

### Trip Generation

Traffic volumes generated by the proposed development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 11th Edition*. **Tables 3A and 3B** presents the anticipated vehicular trip generation for the proposed development.

**Table 3A. Trip Generation Methodology**

Land Use	Land Use Code	Daily	Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
			Method	Enter/Exit	Method	Enter/Exit
Townhomes	215	$T = 7.62(X) - 50.48$	$T = 0.52(X) - 5.70$	31%/69%	$T = 0.60(X) - 3.93$	57%/43%

X = Independent Variable (units) | Y = Independent Variable (units) | T = Trips

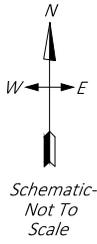
**Table 3B. Vehicular Trip Generation**

Land Use	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes	195 units	1,435	30	66	96	64	49	113

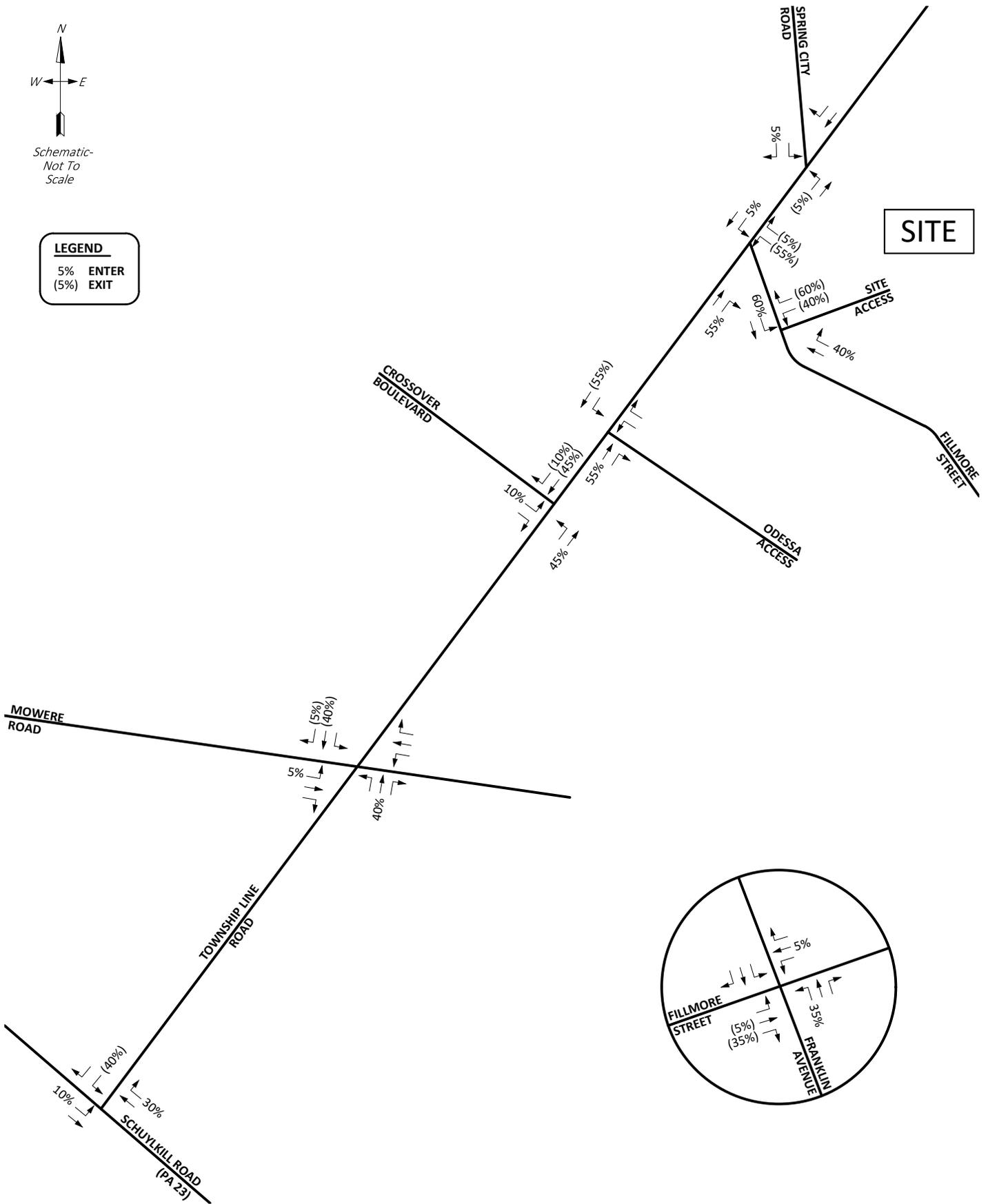
(1) ITE Land Use Code 215 for Single-Family Attached Housing.

### Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development's site access. The distribution percentages for the anticipated directions of approach and departure and traffic assignment percentages are illustrated in **Figure 4A**. Application of the percentages illustrated in Figure 4A to the new peak hour trips contained in Table 2B, provides an estimate of site traffic to be added to the study area. The site-generated traffic is also shown in **Figure 4B** for the weekday morning and weekday afternoon peak hours.

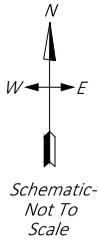


LEGEND	
5%	ENTER
(5%)	EXIT

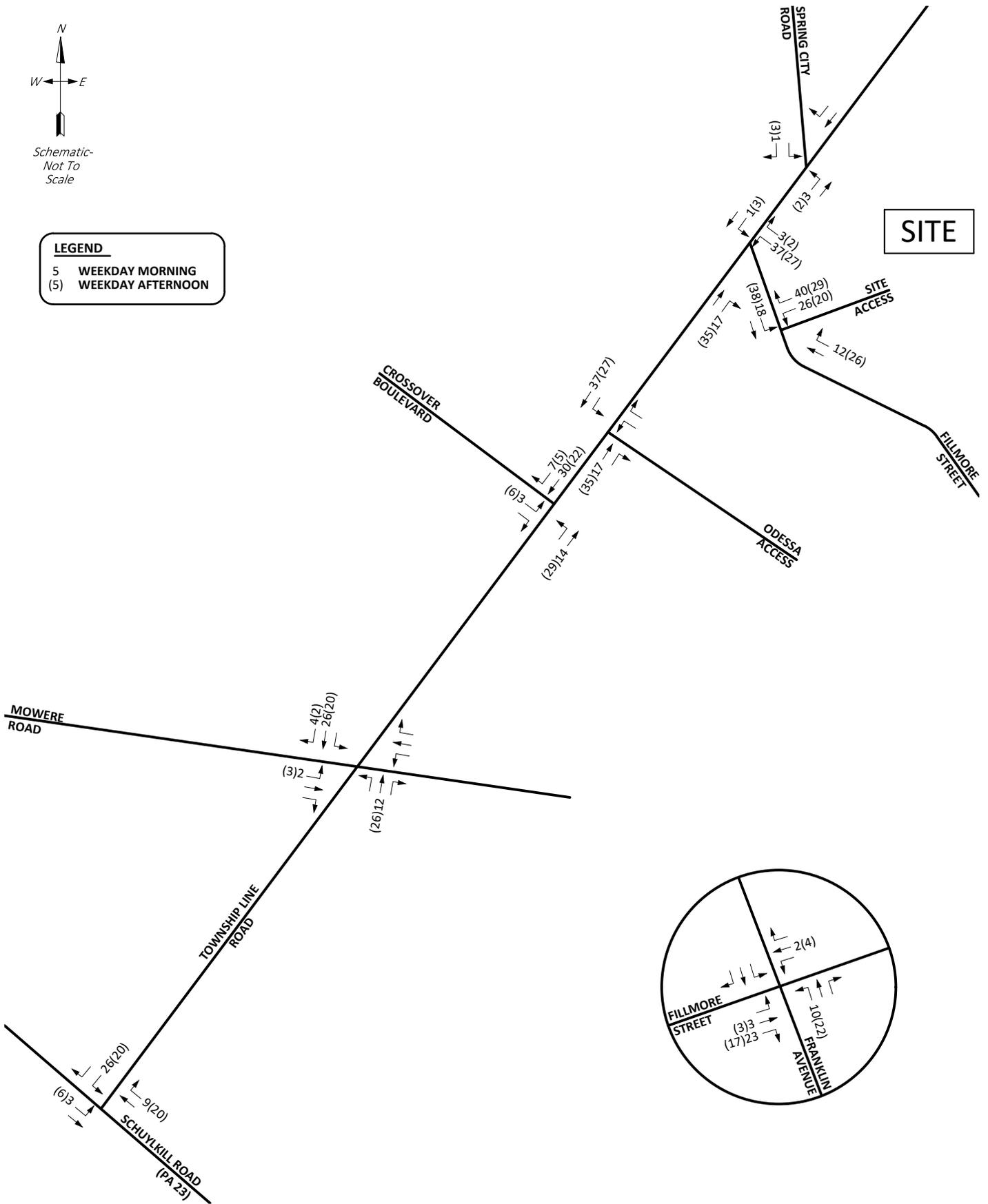


**FIGURE 4A**  
 New Site Trip Distribution  
**TRIESTE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





LEGEND	
5	WEEKDAY MORNING
(5)	WEEKDAY AFTERNOON



**FIGURE 4B**  
 New Site Trip Assignment  
**TRIESTE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



The intersection of Main Street and Smithworks Boulevard was not included in the Crash Summary because the Pennsylvania Crash Information Tool (PCIT) can only be used to obtain data regarding state roads.

## Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

### Trip Generation

Traffic volumes generated by the proposed development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 11<sup>th</sup> Edition*. **Table 3** presents the anticipated vehicular trip generation for the proposed development. Detailed trip generation calculations are provided in **Appendix E**.

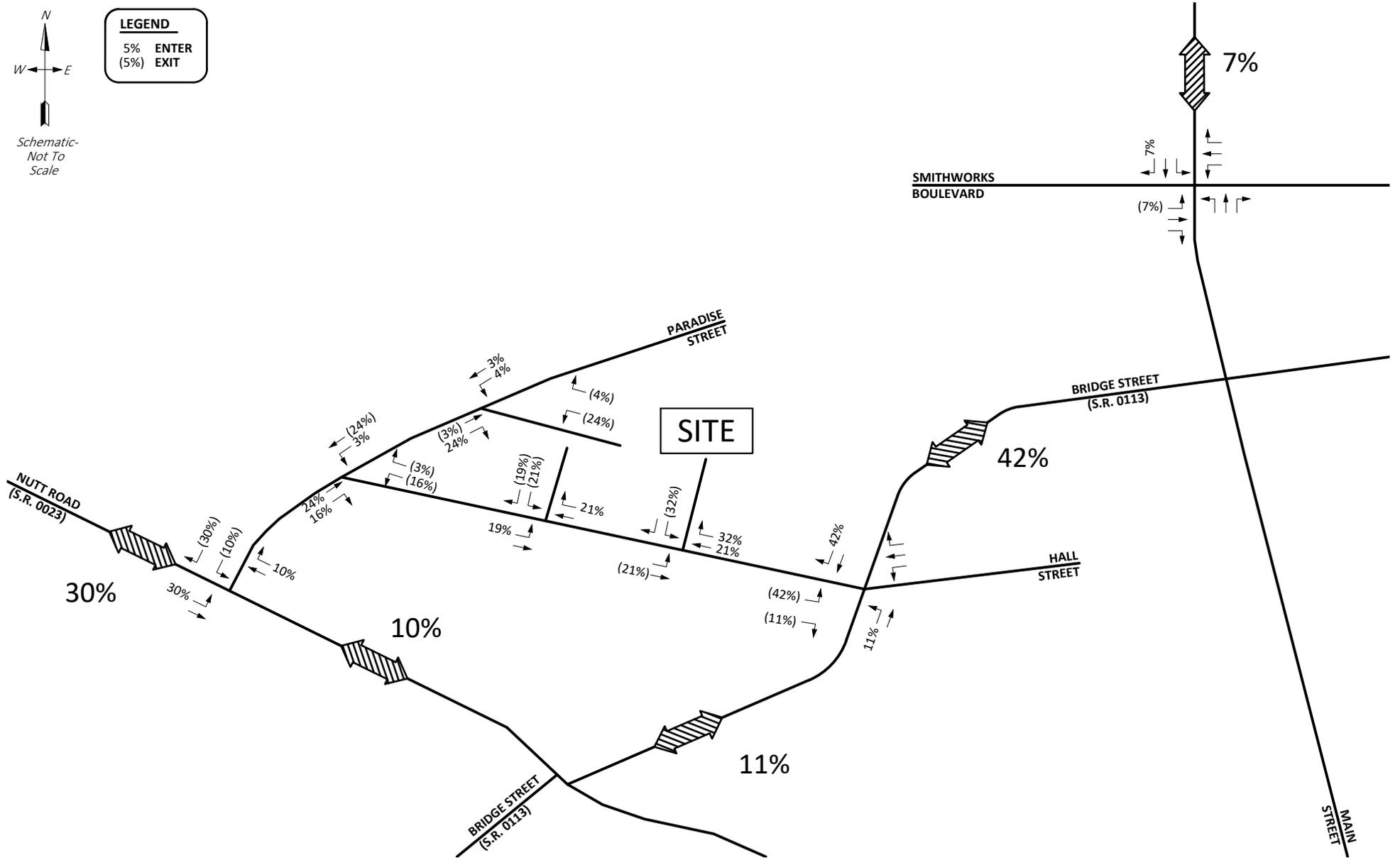
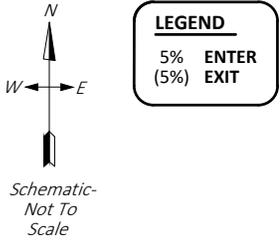
**Table 3. Vehicular Trip Generation**

Land Use	Trip Type	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Proposed Development	Total	1,849	67	95	162	96	66	162
	-Internal	-150	-12	-13	-25	-13	-14	-27
	-Pass-by	-267	-11	-11	-22	-17	-10	-27
	New	1,432	44	71	115	66	42	108

The restaurant space (4,500 square feet) and coffee shop (3,670 square feet) space were combined (8,170 square feet total) and applied to the High Turnover Sit-down Restaurant land use (ITE Land Use Code 932) for the purposes of this evaluation. In discussion with the applicant’s engineer, it is anticipated that coffee shop will primarily serve building residents and nearby neighbors, unlike a national chain shop that would be situated along a suburban arterial road or within a shopping center. Also, the restaurant and coffee shop may likely have alternating peak hours of operations. If these commercial tenants change or operating hours change significantly, an updated traffic impact analysis may be needed. Furthermore, the traffic generation methodology accounts for internalized trip generation between residents and the non-residential uses on site.

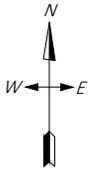
### Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development’s site access. The distribution percentages for the anticipated directions of approach and departure and traffic assignment



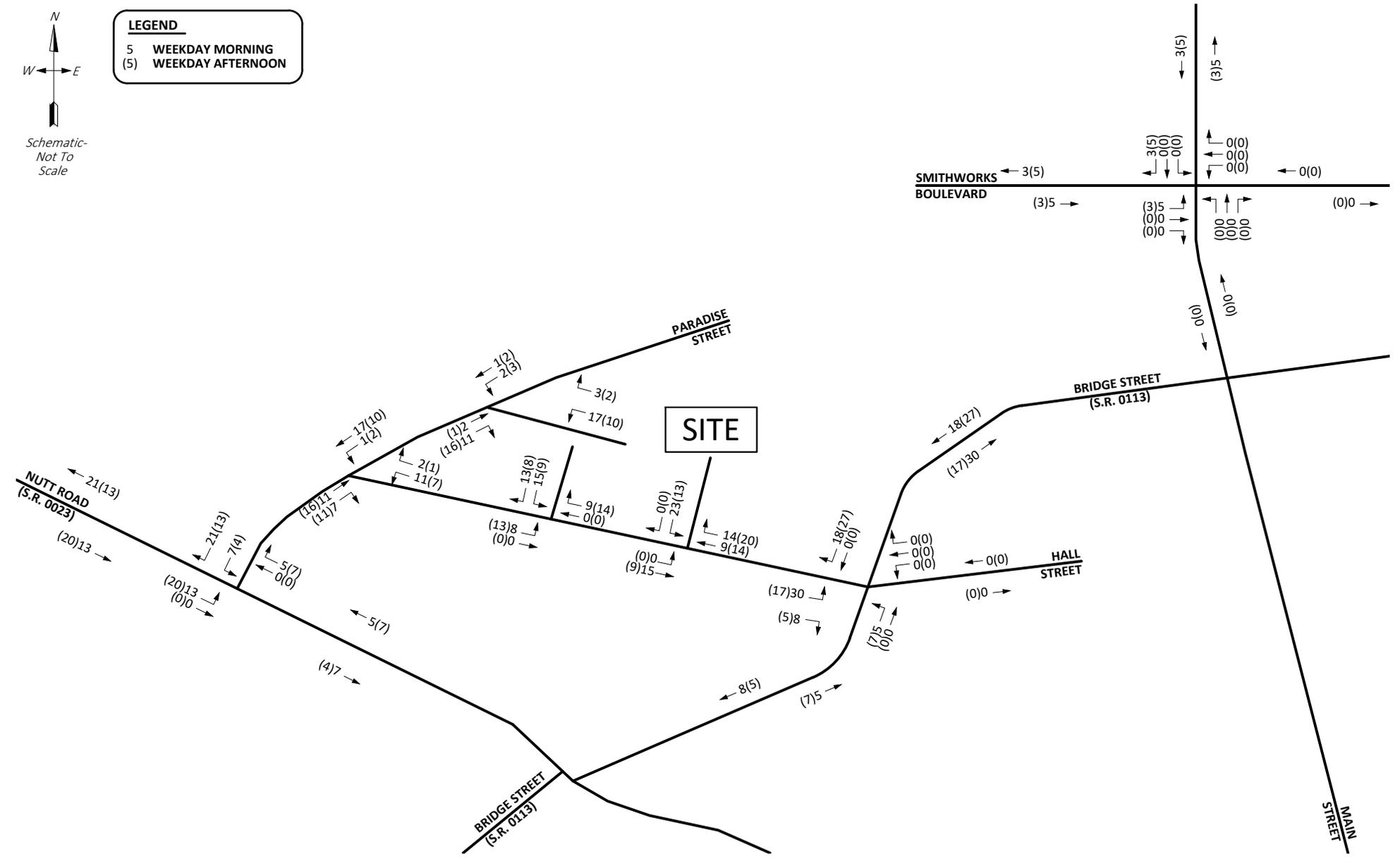
**FIGURE 4A**  
 New Trip Distribution  
**PARADISE VILLAGE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





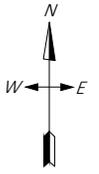
**LEGEND**  
 5 WEEKDAY MORNING  
 (5) WEEKDAY AFTERNOON

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 Not To  
 Scale



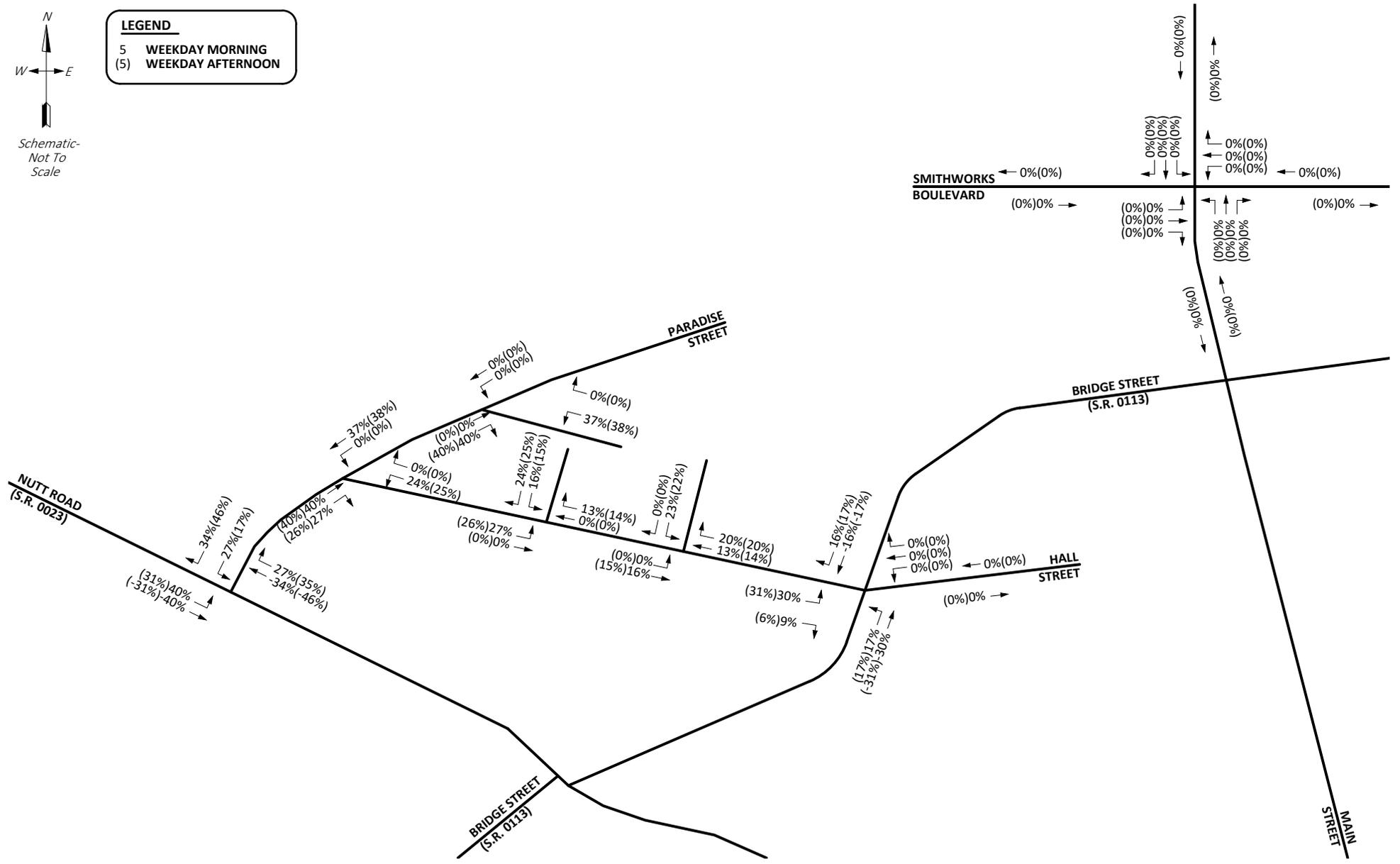
**FIGURE 4B**  
 New Trip Assignment  
**PARADISE VILLAGE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





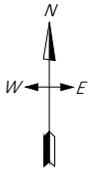
**LEGEND**  
 5 WEEKDAY MORNING  
 (5) WEEKDAY AFTERNOON

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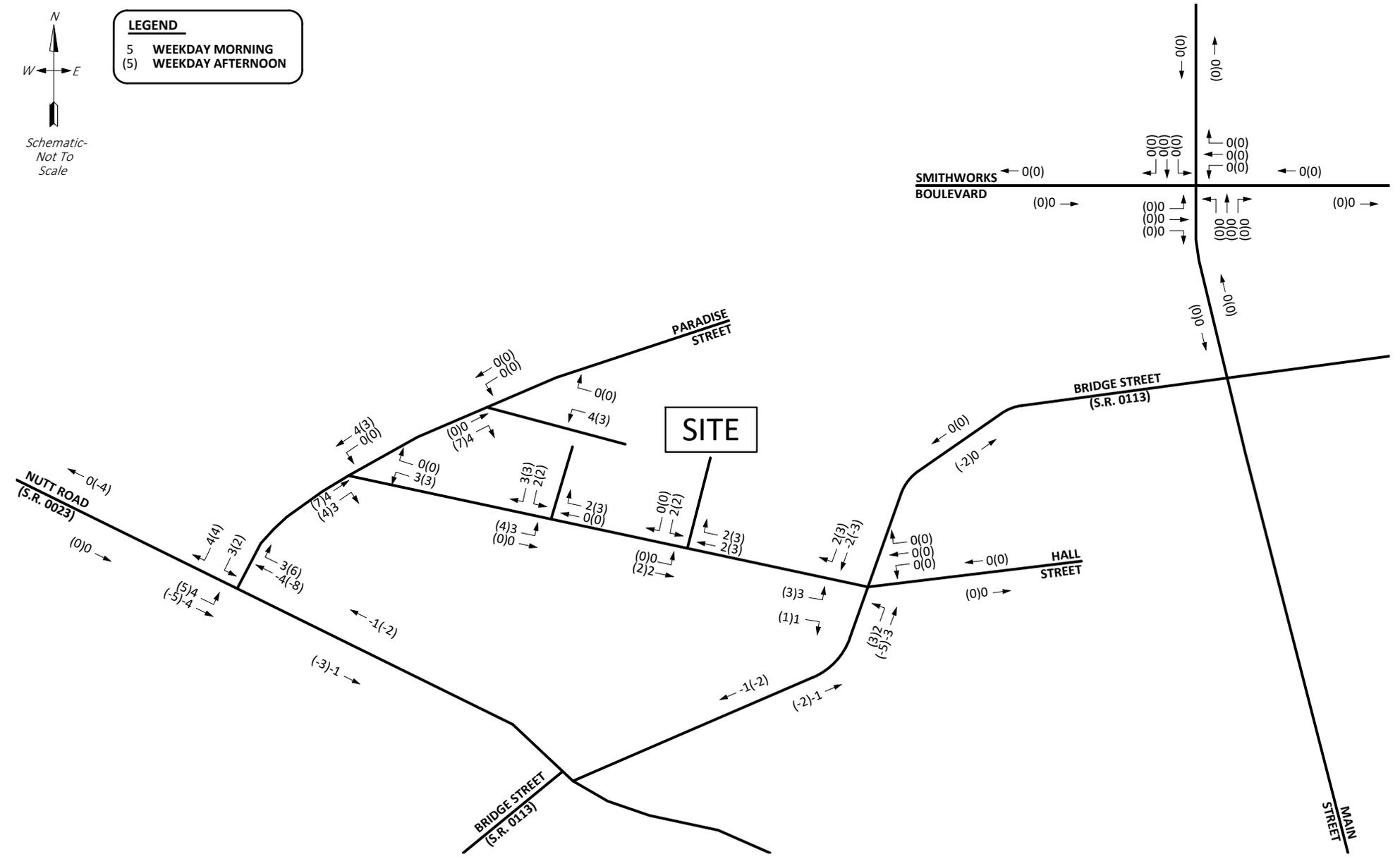
**FIGURE 4C**  
 Pass-By Trip Distribution  
**PARADISE VILLAGE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





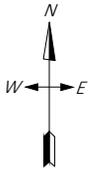
**LEGEND**  
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 (5) WEEKDAY AFTERNOON

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 Scale



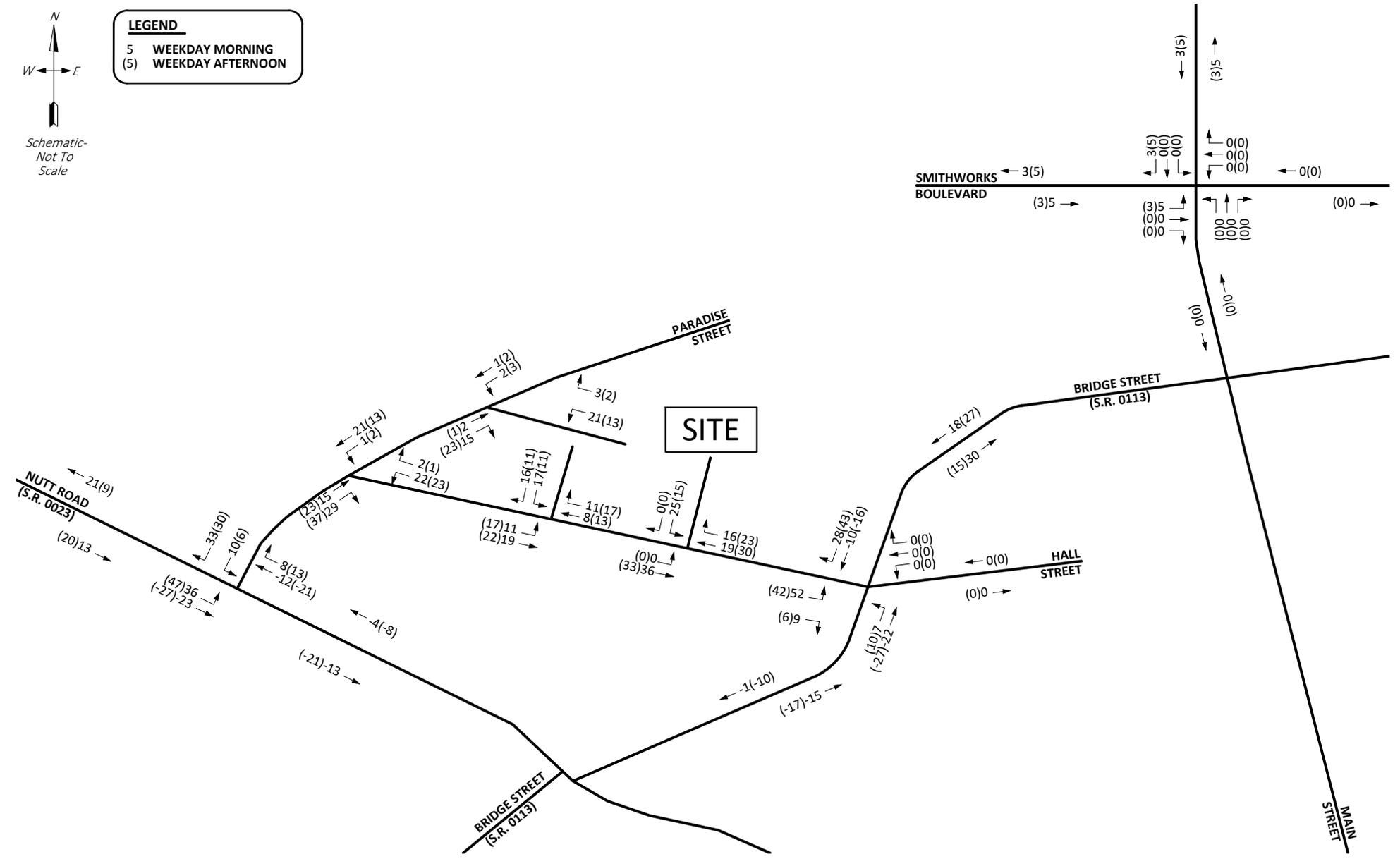
**FIGURE 4D**  
 Pass-By Trip Assignment  
**PARADISE VILLAGE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





**LEGEND**  
 5 WEEKDAY MORNING  
 (5) WEEKDAY AFTERNOON

Schematic-  
 Not To  
 Scale



**FIGURE 4E**  
 Net Trip Assignment  
**PARADISE VILLAGE**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



## Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

### Trip Generation

Traffic volumes generated by the proposed development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 11<sup>th</sup> Edition*. **Table 4** presents the anticipated vehicular trip generation for the proposed redevelopment. Detailed trip generation calculations are provided in **Appendix E**.

**Table 4. Vehicular Trip Generation**

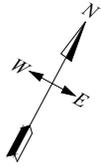
Land Use	Trip Type	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour			Saturday Midday Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Proposed Redevelopment	Total	4,345	124	186	310	231	180	411	237	228	465
	-Internal	-1,026	-20	-20	-40	-76	-76	-152	-58	-58	-116
	-Pass-by	<u>-448</u>	<u>-19</u>	<u>-17</u>	<u>-36</u>	<u>-32</u>	<u>-20</u>	<u>-52</u>	<u>-29</u>	<u>-24</u>	<u>-53</u>
	New	2,871	85	149	234	123	84	207	150	146	296

For the purposes of this evaluation, the traffic generation for the retail component assumed approximately 10,150 square feet (or approximately 25 percent) of the total 40,600 square feet retail will be reserved for restaurant(s) and the remaining space will be occupied by typical retailers. If the retail/restaurant split changes significantly, an updated traffic impact analysis may be needed. Furthermore, the traffic generation methodology accounts for internalized trip generation between residents and the non-residential uses on site.

Further, based on a review of ITE data, the apartments may generate up to 30 to 60 pedestrian trips during the commuter peak hours. Although there is no available pedestrian trip generation for the retail or restaurant land uses, it is anticipated that the future commercial tenants will also generate a significant number of pedestrian trips and the numbers will depend on the type of tenants. Pass-by trips associated with the commercial land uses were also considered.

### Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development's site access. The distribution percentages for the anticipated directions of approach and departure and traffic assignment

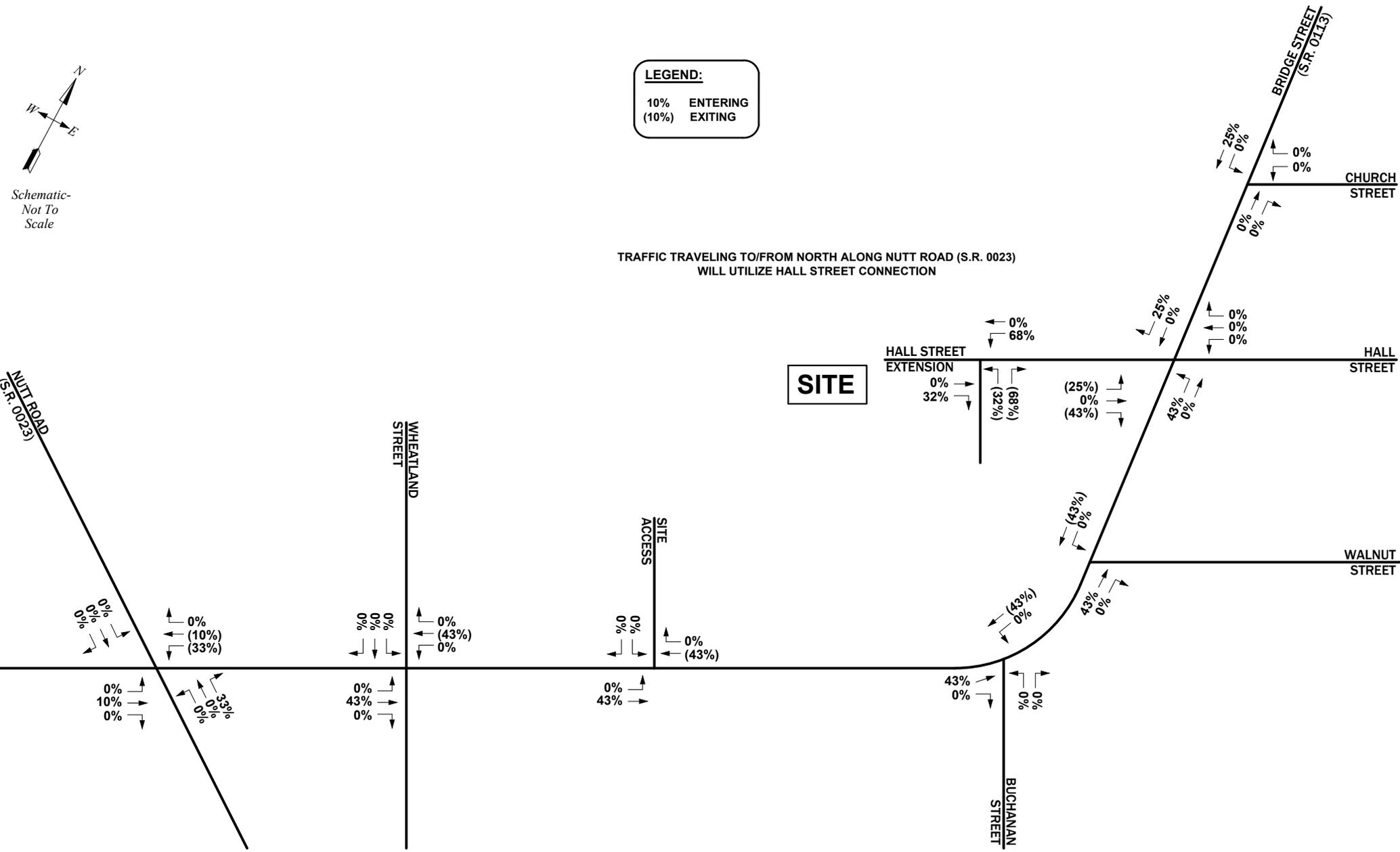


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**LEGEND:**  
 10% ENTERING  
 (10%) EXITING

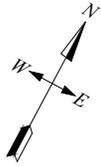
TRAFFIC TRAVELING TO/FROM NORTH ALONG NUTT ROAD (S.R. 0023)  
 WILL UTILIZE HALL STREET CONNECTION

**SITE**



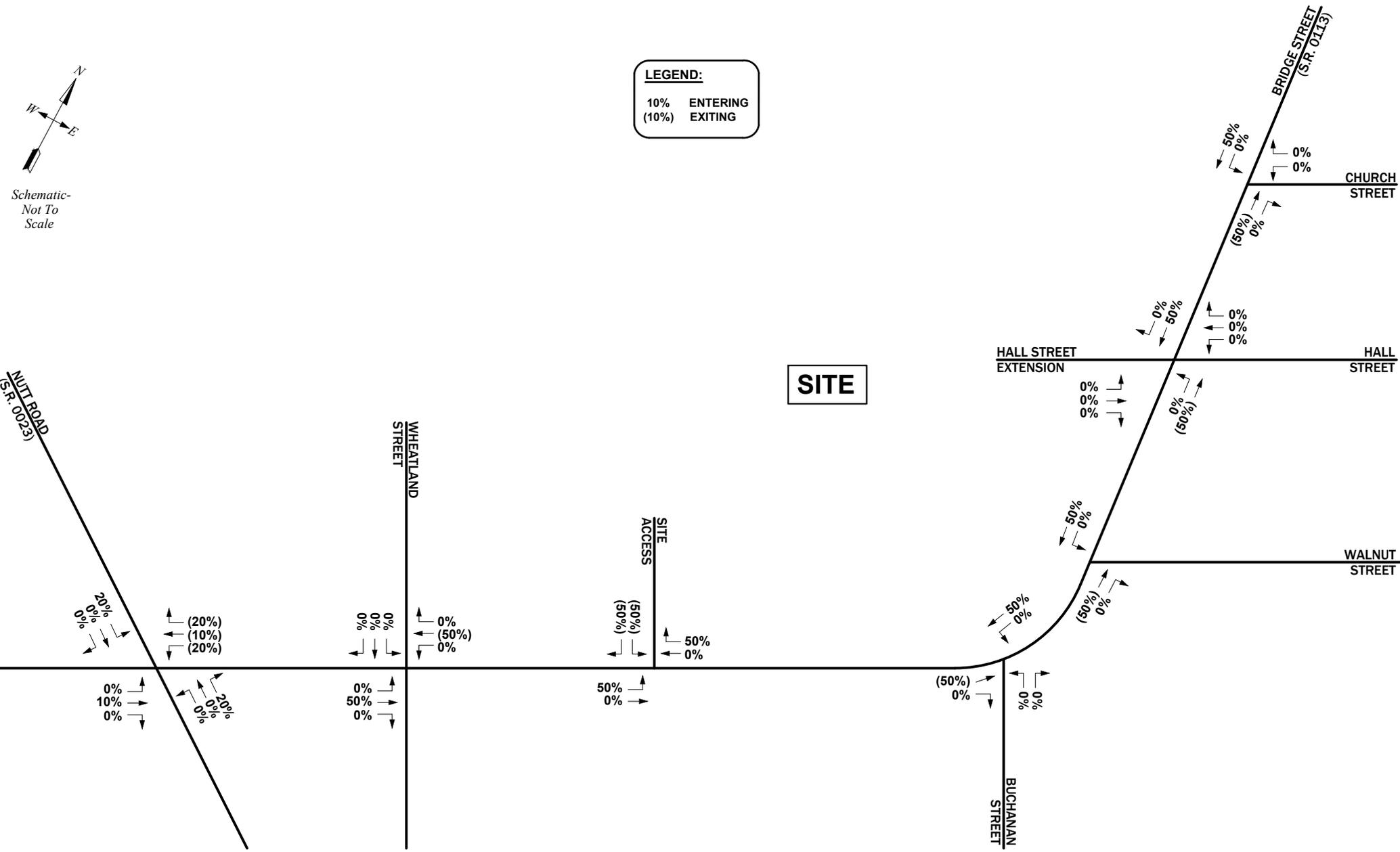
**FIGURE 4A**  
 New Site Trip Distribution (Residential)  
**STEELWORKS**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





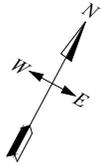
Schematic-  
Not To  
Scale

**LEGEND:**  
 10% ENTERING  
 (10%) EXITING



**FIGURE 4B**  
 New Site Trip Distribution (Commercial)  
**STEELWORKS**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA

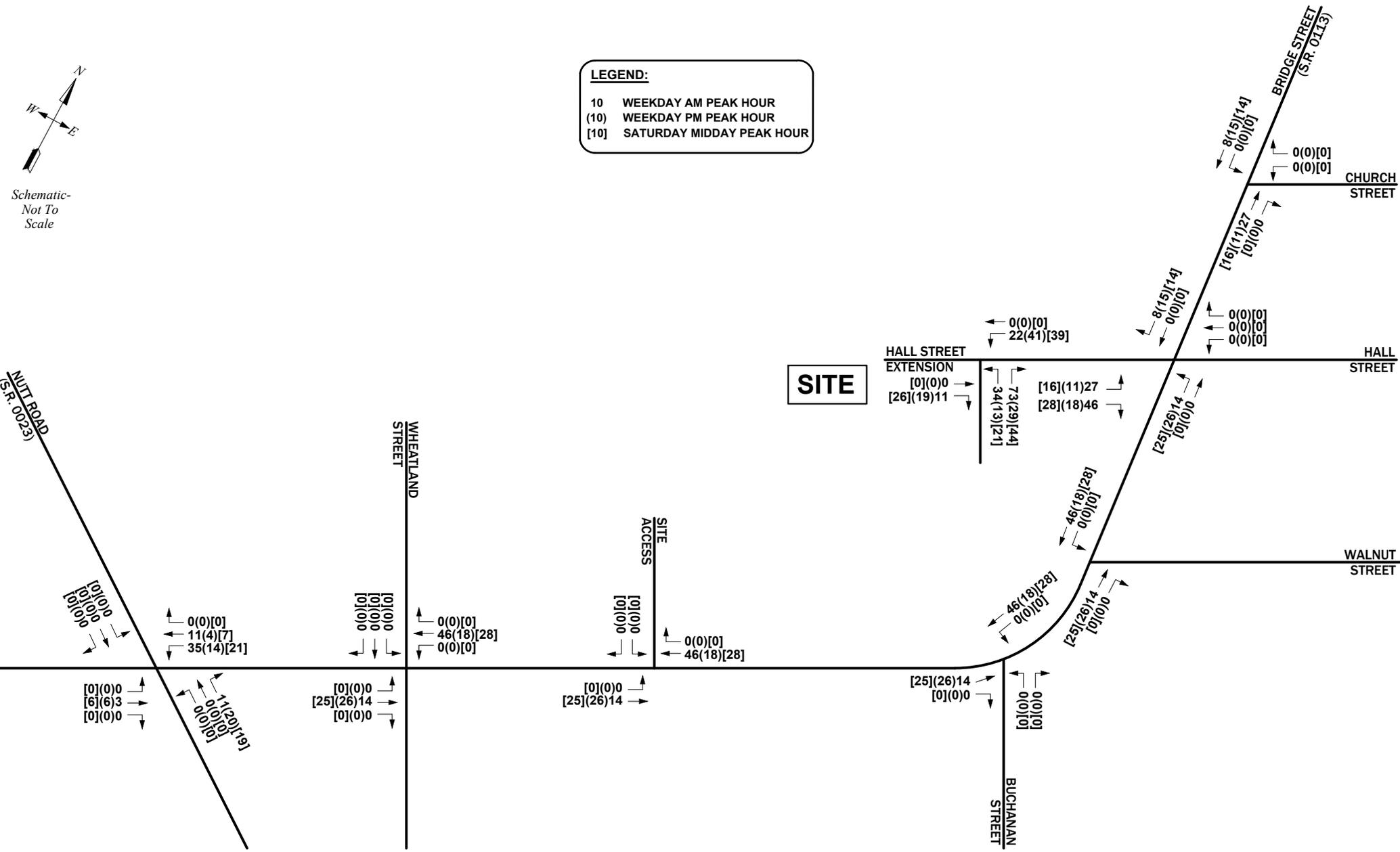




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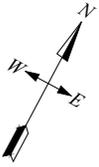
**LEGEND:**

- 10 WEEKDAY AM PEAK HOUR
- (10) WEEKDAY PM PEAK HOUR
- [10] SATURDAY MIDDAY PEAK HOUR



**FIGURE 4C**  
 New Site Trip Assignment (Residential)  
**STEELWORKS**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA

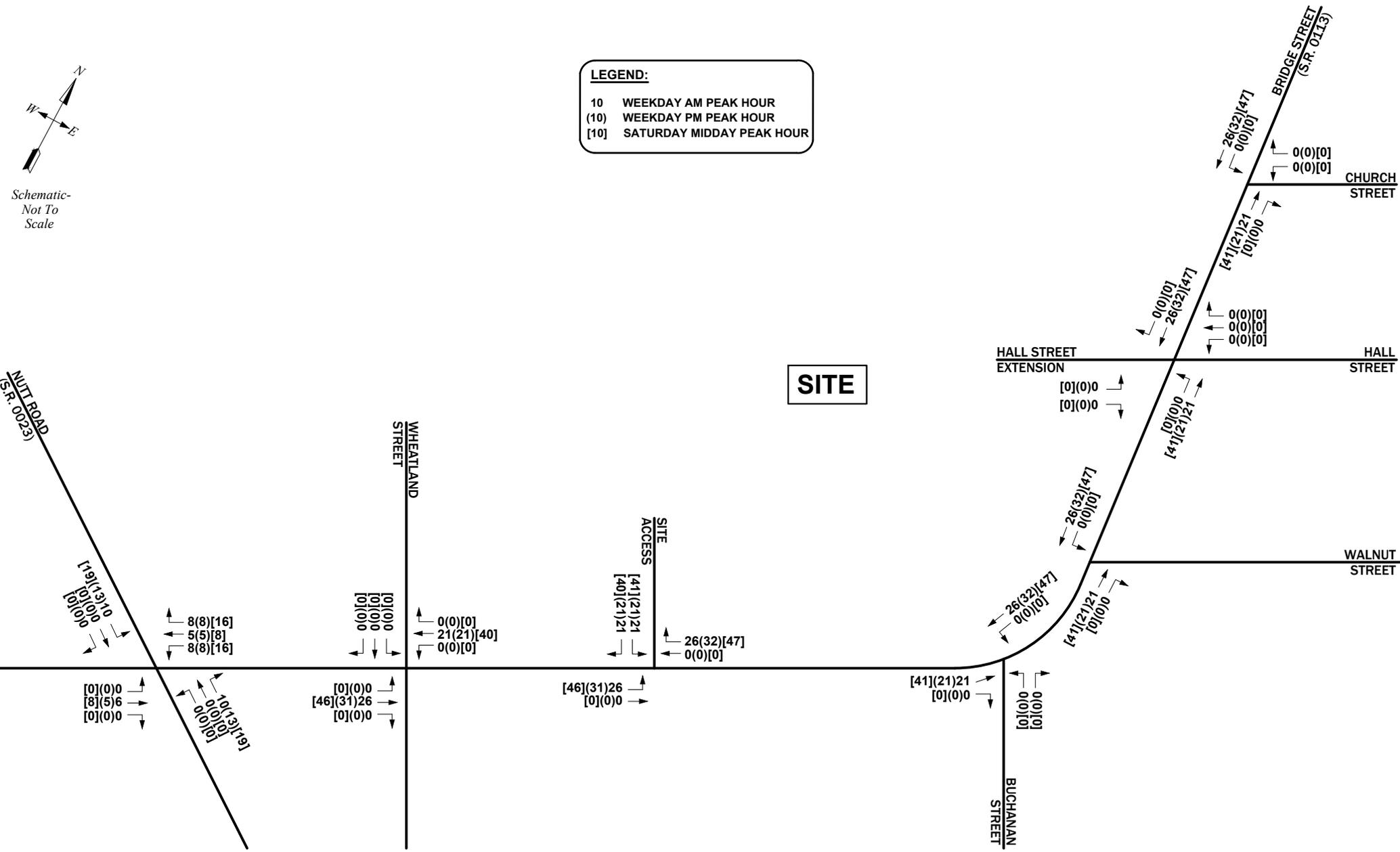




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Scale

LEGEND:	
10	WEEKDAY AM PEAK HOUR
(10)	WEEKDAY PM PEAK HOUR
[10]	SATURDAY MIDDAY PEAK HOUR

**SITE**



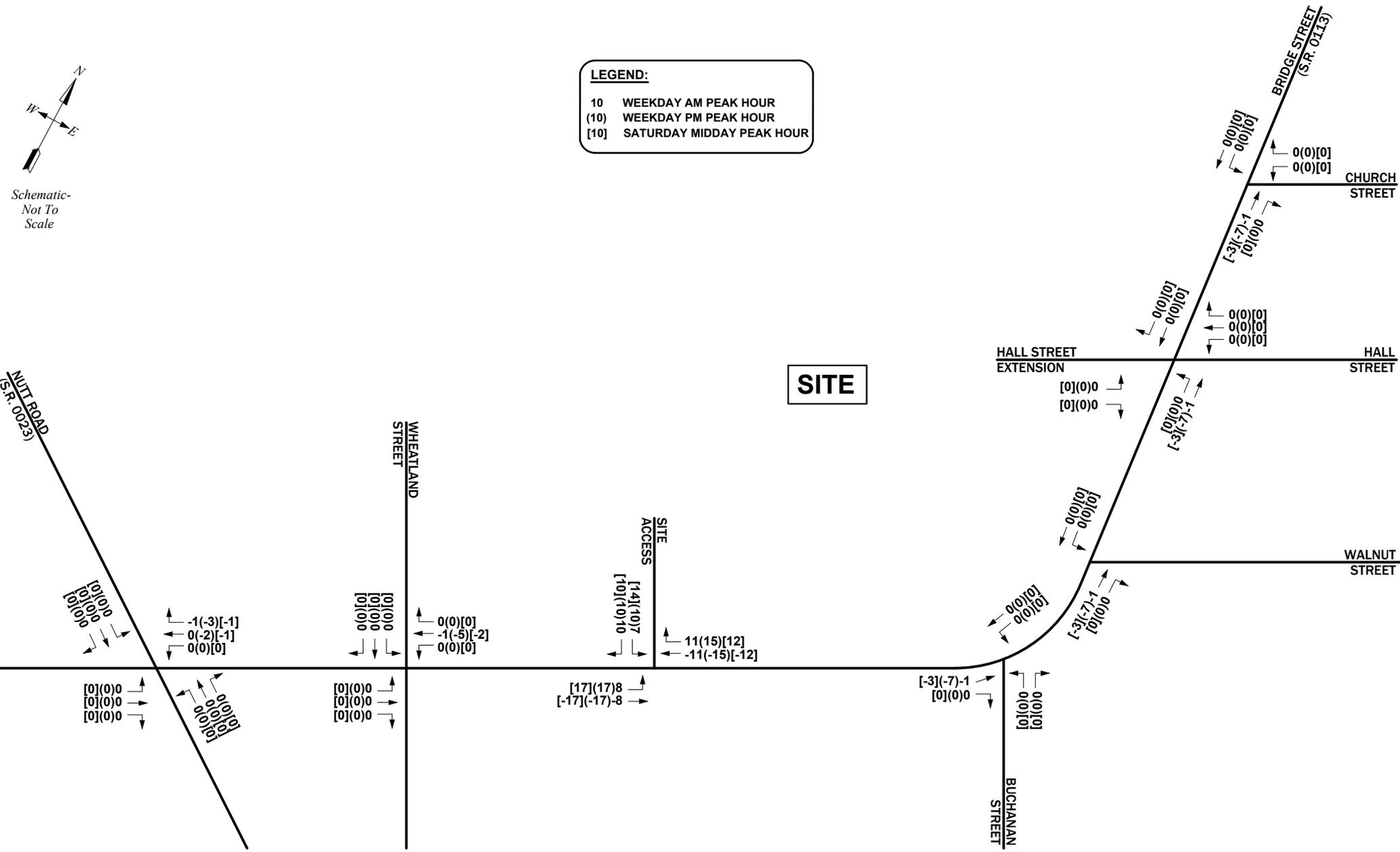
**FIGURE 4D**  
 New Site Trip Assignment (Commercial)  
**STEELWORKS**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA





Schematic-  
Not To  
Scale

**LEGEND:**  
 10 WEEKDAY AM PEAK HOUR  
 (10) WEEKDAY PM PEAK HOUR  
 [10] SATURDAY MIDDAY PEAK HOUR



**FIGURE 4E**  
 Pass-by Trip Assignment (Commercial)  
**STEELWORKS**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



## Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

### Trip Generation

Traffic volumes generated by the proposed redevelopment were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 10th Edition*. **Table 3** presents the anticipated vehicular trip generation for the proposed redevelopment.

**Table 3. Vehicular Trip Generation (Full Build-Out)**

Land Use	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour			Saturday Midday Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Apartments <sup>(1)</sup>	76 units	412	7	19	26	21	13	34	19	20	39
Retail <sup>(2)</sup>	19,380	732	11	7	18	35	39	74	45	42	87
- Pass-by <sup>(3)</sup>	square	<u>-176</u>	<u>-3</u>	<u>-2</u>	<u>-5</u>	<u>-12</u>	<u>-13</u>	<u>-25</u>	<u>-12</u>	<u>-11</u>	<u>-23</u>
New Trips	feet	556	8	5	13	23	26	49	33	31	64
Total Trips		1,144	18	26	44	56	52	108	64	62	126
-Pass-by Trips		<u>-176</u>	<u>-3</u>	<u>-2</u>	<u>-5</u>	<u>-12</u>	<u>-13</u>	<u>-25</u>	<u>-12</u>	<u>-11</u>	<u>-23</u>
New Trips		968	15	24	39	44	39	83	52	51	103

(1) ITE Land Use Code 221 for Multi-Family Housing (Mid-Rise).

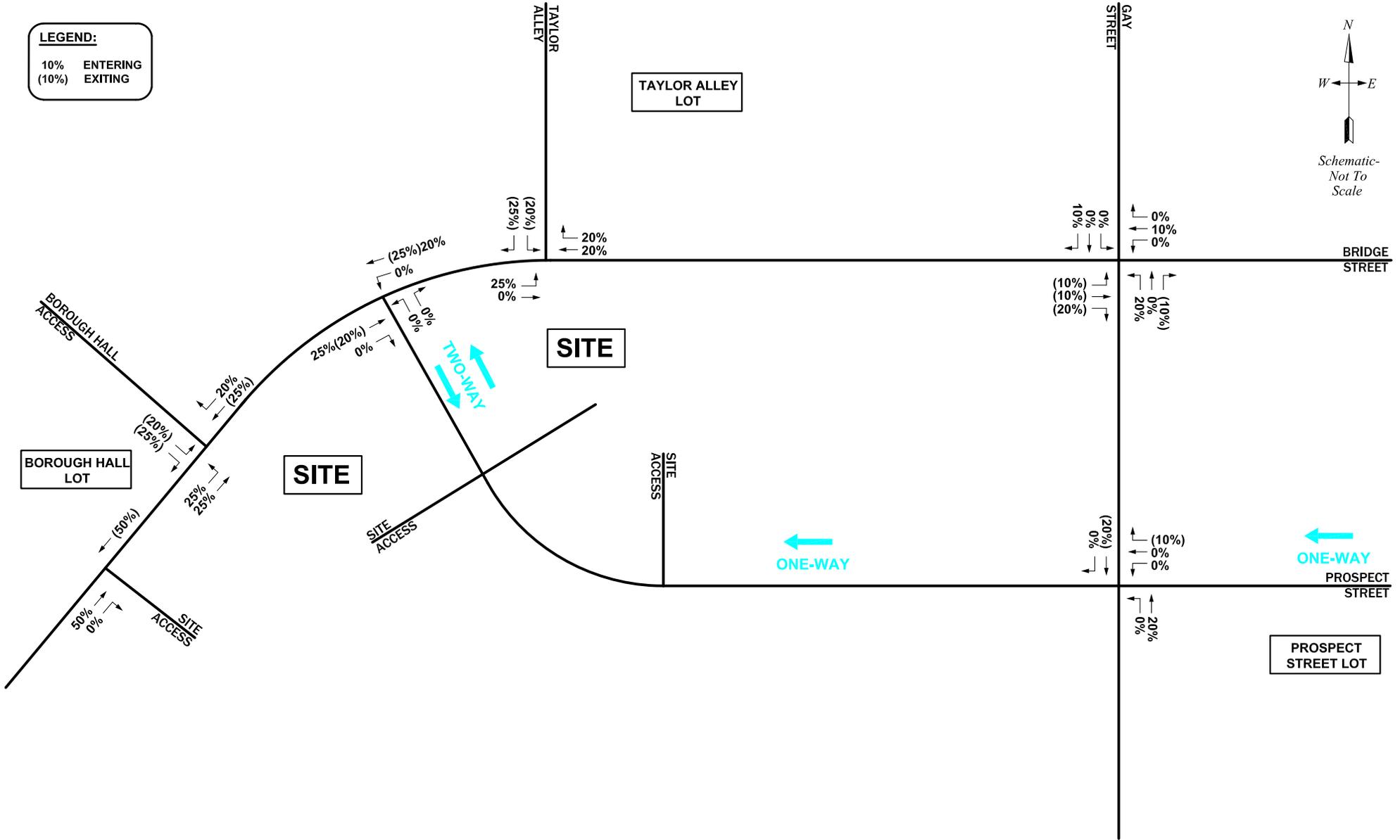
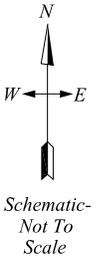
(2) ITE Land Use Code 820 for Shopping Center

(3) Estimated to be 34 percent during the weekday afternoon peak hour and 26 percent during the Saturday midday peak hour, based on the ITE Publication *Trip Generation Handbook, Third Edition*. Assumed to be 24 percent, or 10 percent less than the weekday afternoon peak hour, during the weekday morning peak hour and on a daily basis.

Given the dense multi-use urban location of the proposed redevelopment, the site could generate less vehicle trips than a traditional apartment building and traditional commercial retail space in a typical non-walkable, suburban environment. The trip generation presented in Table 3 above assumes that the tenants of the commercial portion of the redevelopment are more typical smaller service based retail store fronts. If the space is occupied by a restaurant, or other higher trip generating retail uses, then the results and conclusions of this study may need to be reevaluated.

Further, based on a review of ITE data, the apartments may generate up to 30 to 50 pedestrian trips during the commuter peak hours. Although there is no available pedestrian trip generation for the retail land use, it is anticipated that the future retail tenants will also generate a significant amount of pedestrian trips and the numbers will depend on the type of retail. Furthermore, it is noted that due to the limited parking provide on-site, a portion of the vehicular site trip generation will also be

**LEGEND:**  
 10% ENTERING  
 (10%) EXITING



**FIGURE 4A**

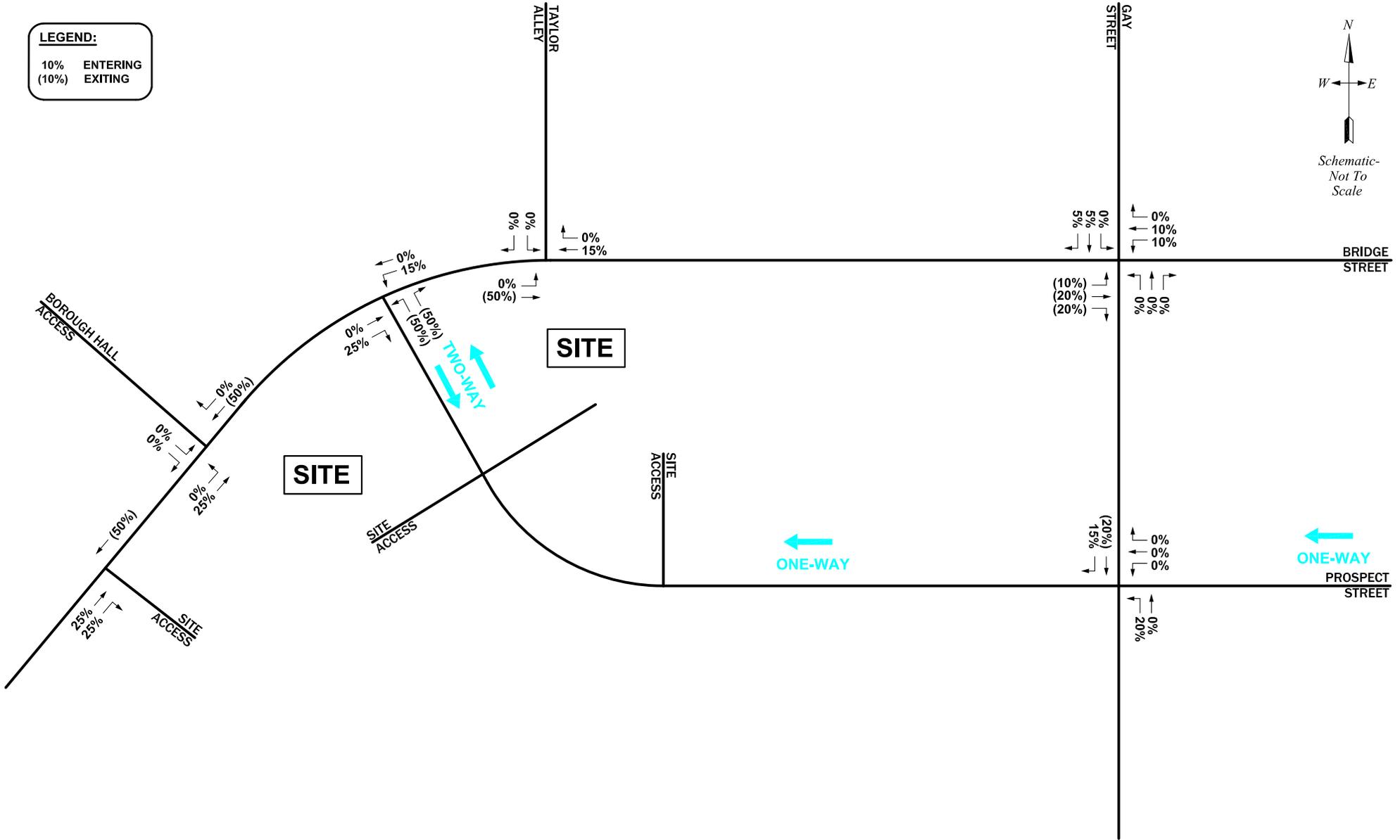
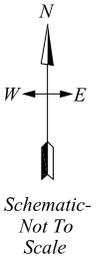
New Site Trip Distribution - Retail

# 348-370 BRIDGE STREET REDEVELOPMENT

BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



**LEGEND:**  
 10% ENTERING  
 (10%) EXITING



**FIGURE 4B**

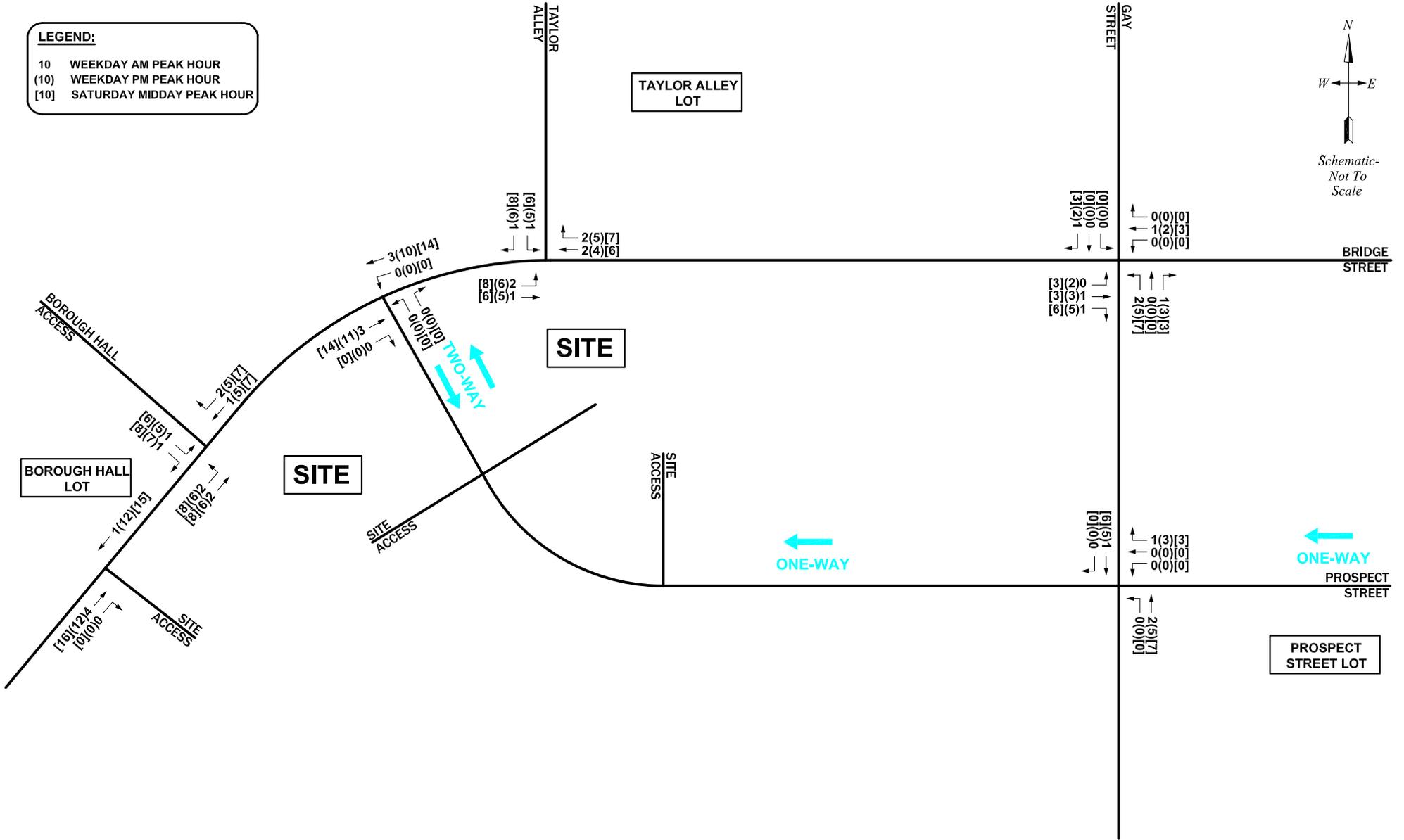
New Site Trip Distribution - Residential

# 348-370 BRIDGE STREET REDEVELOPMENT

BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



**LEGEND:**  
 10 WEEKDAY AM PEAK HOUR  
 (10) WEEKDAY PM PEAK HOUR  
 [10] SATURDAY MIDDAY PEAK HOUR



**FIGURE 4C**

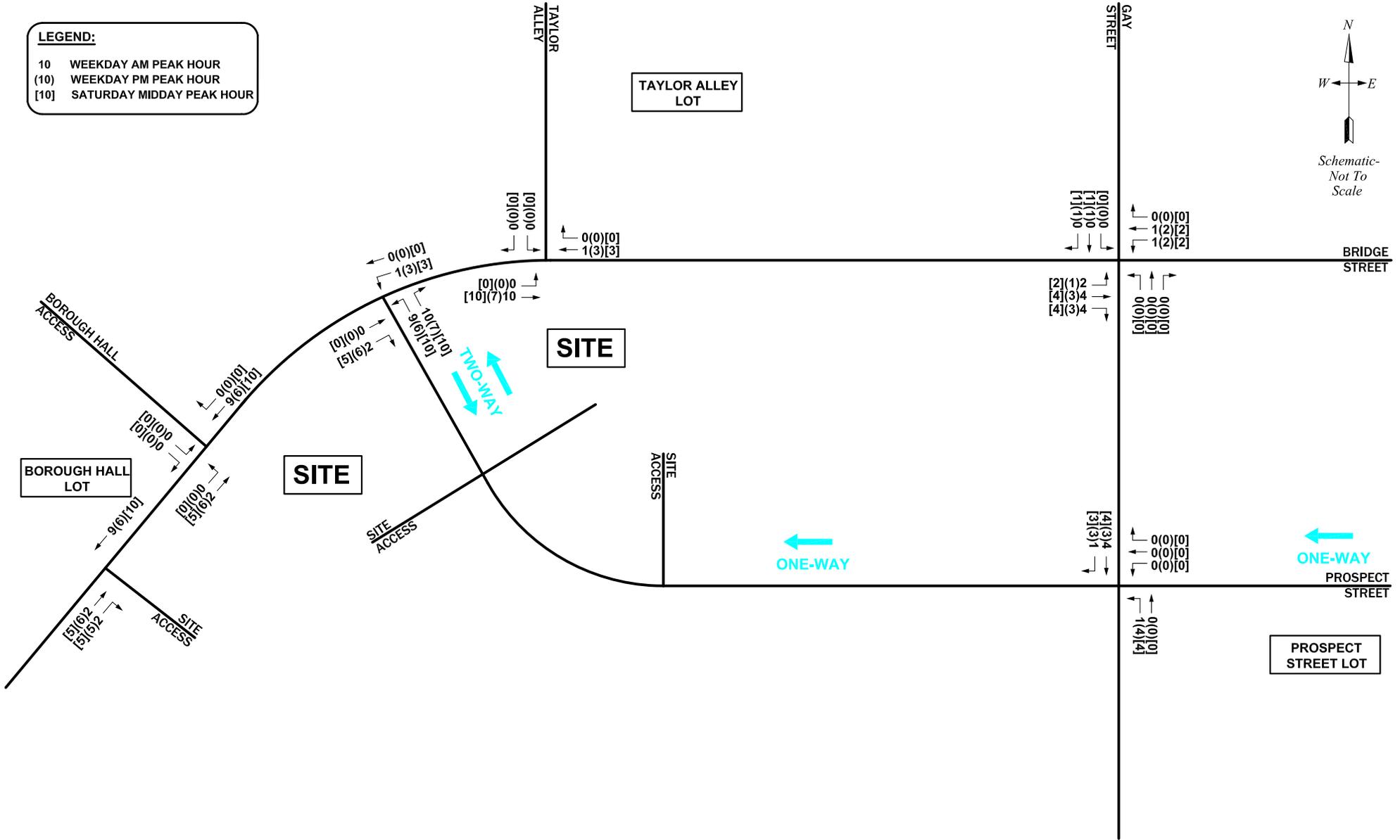
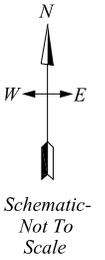
New Site Trip Assignment - Retail

# 348-370 BRIDGE STREET REDEVELOPMENT

BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



**LEGEND:**  
 10 WEEKDAY AM PEAK HOUR  
 (10) WEEKDAY PM PEAK HOUR  
 [10] SATURDAY MIDDAY PEAK HOUR



**FIGURE 4D**

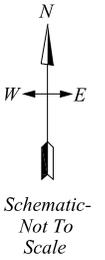
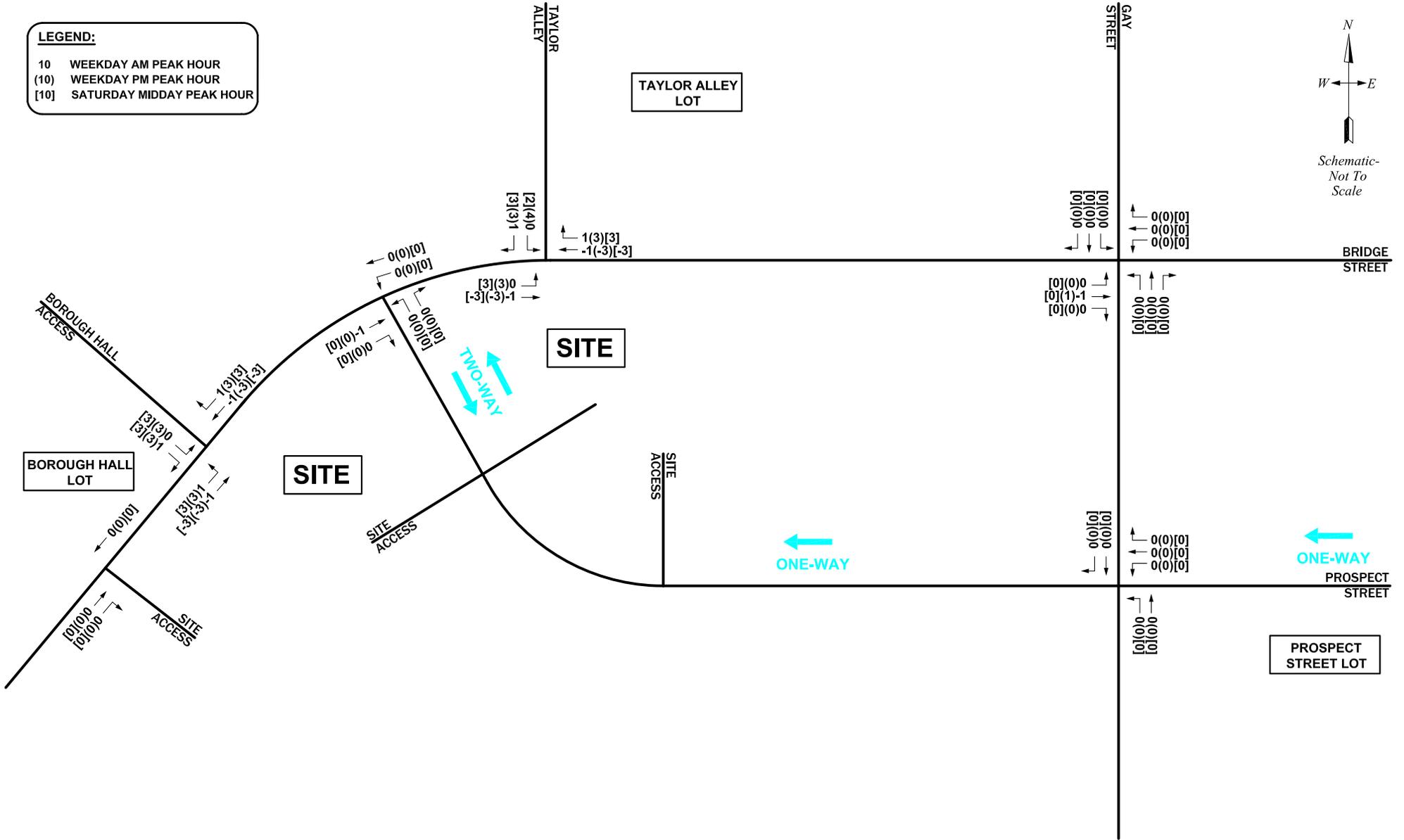
New Site Trip Assignment - Residential

# 348-370 BRIDGE STREET REDEVELOPMENT

BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



**LEGEND:**  
 10 WEEKDAY AM PEAK HOUR  
 (10) WEEKDAY PM PEAK HOUR  
 [10] SATURDAY MIDDAY PEAK HOUR



**FIGURE 4E**

Pass-by Site Trip Assignment  
**348-370 BRIDGE STREET REDEVELOPMENT**  
 BOROUGH OF PHOENIXVILLE, CHESTER COUNTY, PA



(2020/07/17) \\extfs\MCM\eng\819160 - 348-370 Main\Traffic\Graphics\2020-07 TIA\Figure 4E.dwg

Saturday midday peak hours, respectively, to account for this effect. All internal capture calculation worksheets are contained in Appendix E.

According to studies conducted by ITE, traffic associated with LUC 850 and LUC 912 is not 100% newly generated. Rather, a portion of the traffic is diverted from the existing traffic stream on the adjacent roadway network. This is because the Aldi Food Market and Bank with Drive-Through are not exclusively destination land uses, instead patrons stop on their way to/from other locations such as home or work. ITE identifies a 24% passby traffic percentage during the weekday evening PSH and 19% passby traffic percentage during Saturday midday peak hours for LUC 850. There is no passby traffic percentage during the weekday morning.

Additionally, ITE identifies a 29% passby traffic percentage during the weekday morning PSH, a 35% passby traffic percentage during the weekday evening PSH, and a 38% passby traffic percentage during Saturday midday peak hour for LUC 912. Table IV below details the traffic volumes associated with the subject project taking into account internal capture and the passby credits.

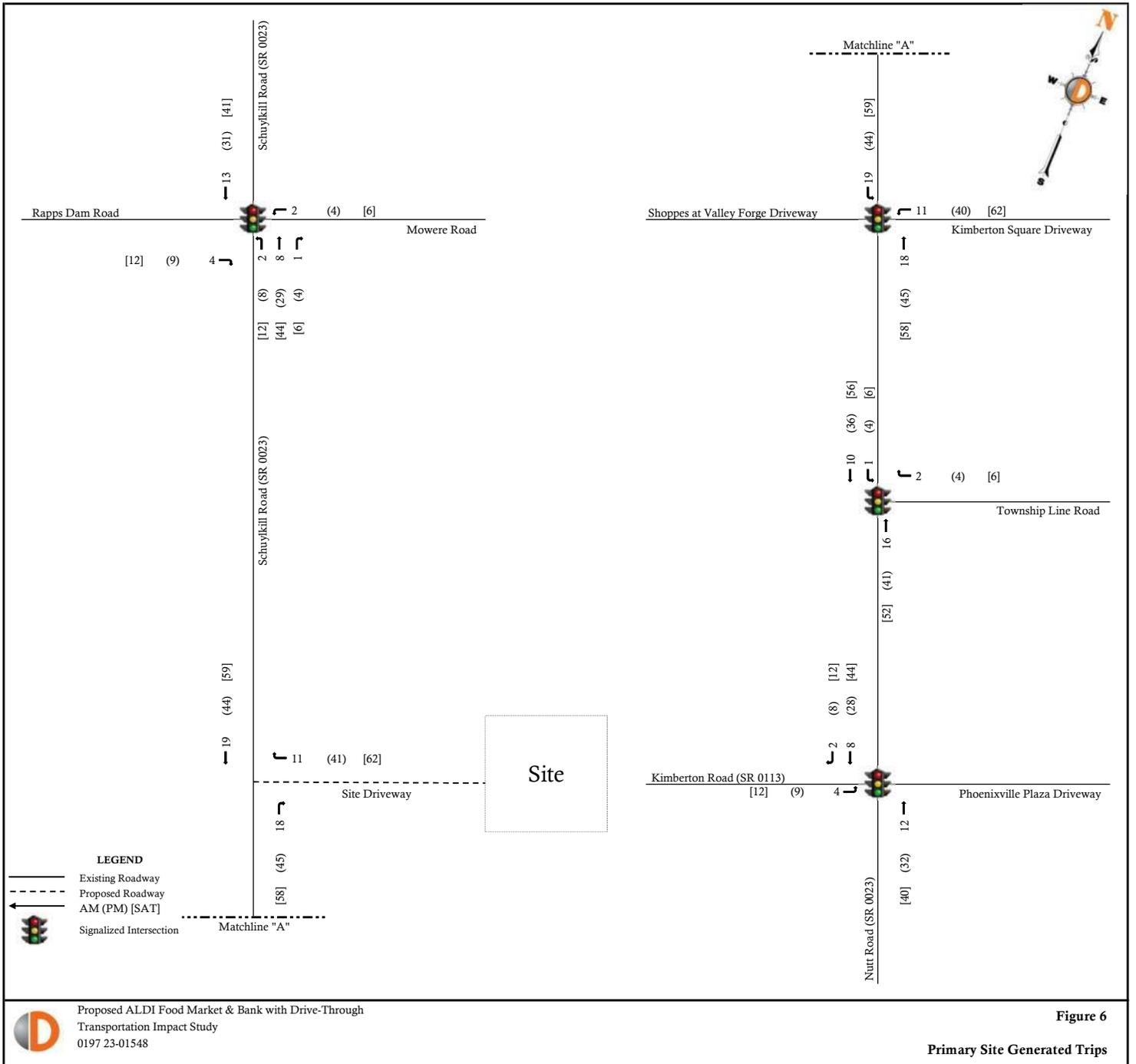
It is the firm’s understanding that the Kimberton Square Shopping Center is fully occupied, and that with the proposed cross access to the Project, internal trips will take place between the existing 26,182 SF retail strip and 6,118 SF restaurant. As the manual turning movement counts were taken at the intersection of the Schuylkill Road (SR 0023) and Kimberton Square/Shoppes at Valley Forge Driveway, the movements in and out of the Kimberton Square driveway are used for the generation of internal capture between the Project and the existing site uses.

**Table IV**  
**Trip Generation Considering Internal Capture and Passby Traffic**

Trip Type		AM PSH			PM PSH			SAT PSH		
		In	Out	Total	In	Out	Total	In	Out	Total
32,300 SF Shopping Plaza (Existing)	Total	39	24	63	71	45	116	34	63	97
	Internal	9	6	15	20	10	30	12	20	32
19,680 Supermarket (Proposed)	Total	33	23	56	104	103	207	137	137	274
	Internal	9	6	15	16	16	32	23	15	38
	Passby	0	0	0	21	21	42	22	23	45
	<b>New (Primary)</b>	24	17	41	67	66	133	92	99	191
3,475 SF Bank with Drive Through (Proposed)	Total	19	16	35	37	36	73	47	45	92
	Internal	2	8	10	3	13	16	6	6	12
	Passby	4	3	7	12	8	20	16	14	30
	<b>New (Primary)</b>	13	5	18	22	15	37	25	25	50
Total (Proposed)	Total	52	39	91	141	139	280	184	182	366
	Internal (Existing)	9	6	15	20	10	30	12	20	32
	Internal (Proposed)	11	14	25	19	29	48	29	21	50
	Passby	4	3	7	33	29	62	38	37	75
	<b>New (Primary)</b>	37	22	59	89	81	170	117	124	241

Once the magnitude of traffic to be generated by the site is known, it is necessary to assign that traffic to the adjacent street system. The distribution of new traffic to the surrounding roadways is based on the location of primary arterial roadways, major signalized intersections and existing traffic patterns.

Located in Appendix B2, Figure 5 illustrates the primary site generated trip distribution, Figure 6 illustrates the primary site generated volumes, Figure 7 illustrates the passby site generated distribution, Figure 8 illustrates the passby site generated volumes, and Figure 9 illustrates the total



## Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

### Trip Generation

Traffic volumes generated by the proposed development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 11th Edition*. **Tables 3A and 3B** present the anticipated vehicular trip generation for the proposed development during the weekday morning commuter peak hour and the weekday afternoon school peak hour. During the weekday afternoon commuter peak hour, the school generates 112 new trips, which is the applicable peak hour for calculating the Act 209 Traffic Impact Fee for this development, which is to be used for off-site traffic improvements.

**Table 3A. Trip Generation Methodology**

Land Use	Land Use Code	Daily	Weekday Morning Peak Hour		Weekday Afternoon School Peak Hour	
			Method	Enter/Exit	Method	Enter/Exit
Elementary School	520	T = 2.27 (X)	T = 0.74 (X)	54%/46%	T = 0.45 (X)	46%/54%

X = Independent Variable (students) | T = Trips

**Table 3B. Vehicular Trip Generation**

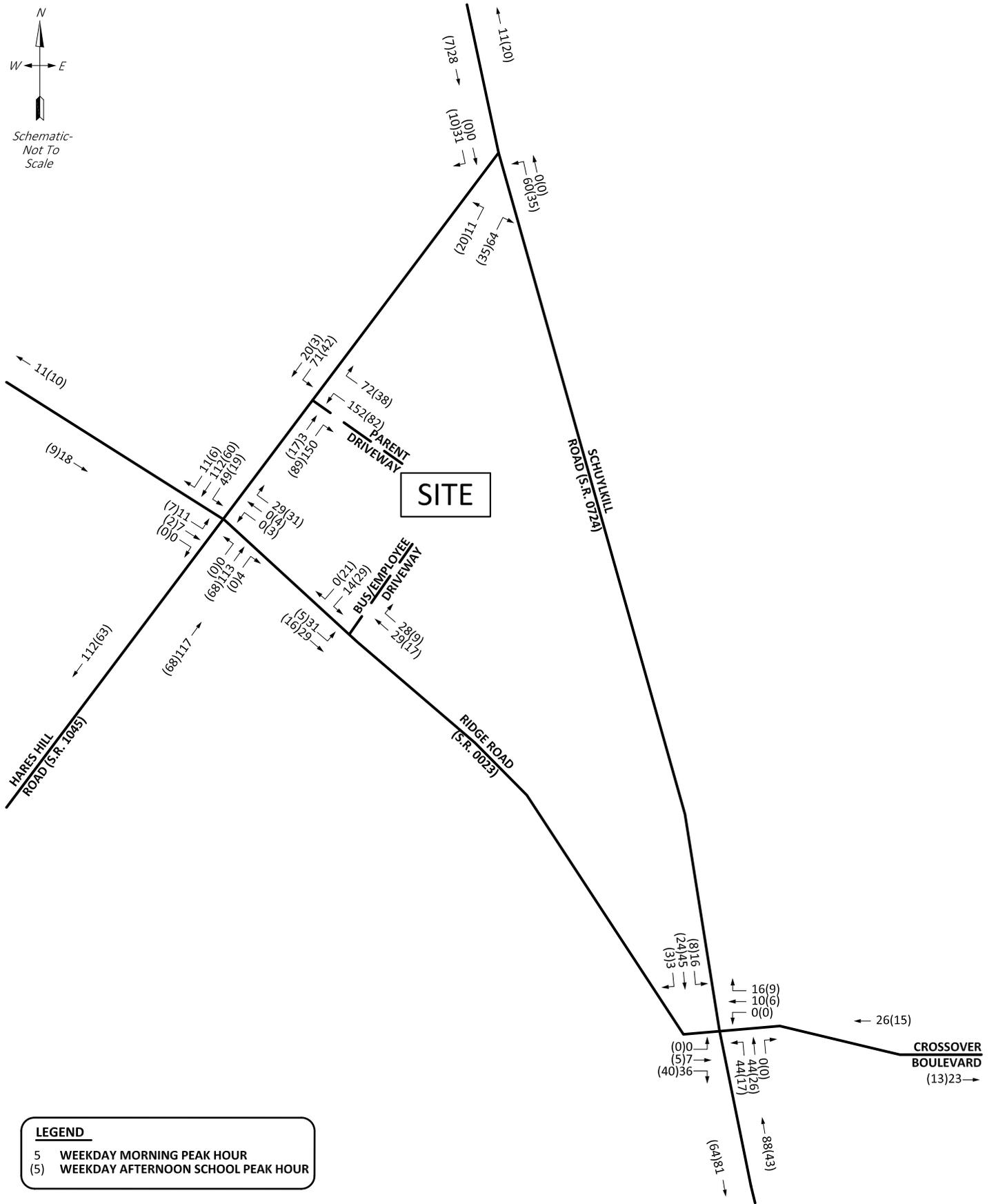
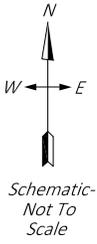
Land Use	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon School Peak Hour		
			In	Out	Total	In	Out	Total
<b>Total Site Traffic</b> <sup>(1)</sup>	<b>700 Students</b>	<b>1590</b>	<b>280</b>	<b>238</b>	<b>518</b>	<b>145</b>	<b>170</b>	<b>315</b>
Buses <sup>(2)</sup>	14 Buses		14	14	28	14	14	28
Faculty/Staff <sup>(3)</sup>	60 total faculty/staff		45	0	45	0	36	36
Parent Pick-Up/Drop-Off <sup>(4)</sup>			221	224	445	131	120	251

(1) Based on the ITE publication *Trip Generation, 11th Edition*, Land Use Code 520, Elementary School.

(2) Based on information provided by the Phoenixville Area School District.

(3) Based on information provided by the Phoenixville Area School District. It is assumed that 75 percent of the faculty/staff enter the site during the weekday morning peak hour, and 60 percent of the faculty/staff exit the site during the weekday afternoon school peak hour

(4) The parent pick-up/drop-off traffic is calculated by reducing the bus and faculty/staff traffic from the total ITE trip generation.



**FIGURE 4F**

New Trip Assignment

**HARES HILL ROAD ELEMENTARY SCHOOL**  
EAST PIKELAND TOWNSHIP, CHESTER COUNTY, PA



# APPENDIX E: Trip Generation and Queueing Data





# Memo

**RE:** **Flagship Car Wash – Trip Generation and Queuing Data**  
 TPD No. BLC.00149

**To:** John Lombardo, *Spotless Brands*  
 Kestra Kelly, *BL Companies*

**Date:** December 18, 2024

As requested, TPD has collected trip generation and queuing data at four (4) existing Flagship Car Wash sites in Maryland and Virginia that have similar characteristics to the proposed car wash in Phoenixville Borough, Chester County, PA. **Table 1** below shows the characteristics of the proposed Phoenixville car wash site and the Maryland sites.

**TABLE 1**  
**SITE CHARACTERISTICS**

Site ID	Location	Size (ksf)	# of queue lanes	# of wash tunnels	# of dry tunnels	# of vacuums
Proposed Phoenixville	200 Kimberton Rd, Phoenixville, PA 19460	11.272	2	1	2	13
A	1956 Robert S. Crain Hwy, Bowie, MD 20716	12.871	3	1	2	14
B	155 St. Patrick’s Drive, Waldorf, MD	15.842	2	1	2	0
C	14570 Lee Hwy, Gainesville, VA	11.255	3	1	2*	0
D	632 Grant Street, Herndon, VA	10.992	2	1	2	0

*\*3 dry tunnels, but 2 were used.*

The following is a summary of the trip generation and queuing evaluations:

## Trip Generation

- » **Traffic/Trip Generation Counts** – Vehicle counts were completed during the weekday evening (3:00-7:00 P.M.) and Saturday midday (10:00 A.M.-3:00 P.M.) time periods at each locations. These counts were completed on various days in October, November and December 2024. The count data is **attached**.
- » **Trip Generation Peak Hour** – Utilizing the counts, peak hours, which is the highest four consecutive 15-minute intervals (i.e. 4:00-5:00 P.M.), were determined. The 10/10/24 TIA for the proposed Phoenixville Carwash conducted traffic counts at the study area intersection during the weekday evening (4:00 to 6:00 P.M.) and Saturday midday (11:00 A.M. to 2:00 P.M.) peak periods. As such, the trip generation peak hours were determined for the following periods:

- Between weekday evening (4:00 to 6:00 P.M.) and Saturday midday (11:00 A.M. to 2:00 P.M.) periods consistent with the 10/10/24 TIA for the proposed Phoenixville site.
  - Between the weekday evening (3:00-7:00 P.M.) and Saturday midday (10:00 A.M.-3:00 P.M.) time periods.
- » **Summary – Table 2** summarizes the trip generation data of each site and calculates an average trip generation rate per building size.

**TABLE 2  
FLAGSHIP CAR WASH TRIP GENERATION**

Site ID	Location	Size (ksf)	Weekday Peak Hour of Generator (between 3-7 PM)		Weekday Commuter Peak Hour (between 4-6 PM)		Saturday Peak Hour of Generator (between 10 AM-3 PM)		Saturday Midday Peak Hour (between 11 AM-2 PM)	
			Total Trips	Rate per ksf	Total Trips	Rate per ksf	Total Trips	Rate per ksf	Total Trips	Rate per ksf
A	Bowie, MD	12.871	92	7.15	88	6.84	143	11.11	143	11.11
B	Waldorf, MD	15.842	150	9.47	128	8.08	246	15.53	238	15.02
C	Gainesville, VA	11.255	105	6.63	88	5.55	158	9.97	158	9.97
D	Herndon, VA	10.992	90	5.68	73	4.61	146	9.22	146	9.22
Total		50.96	437	<b>8.58</b>	377	<b>7.40</b>	693	<b>13.60</b>	685	<b>13.44</b>

**Table 3** applies the trip generation rates in **Table 2** to the proposed Phoenixville site (11,272 s.f.), and compares the trip generation to the methodology in the 10/10/24 TIA.

**TABLE 3  
TRIP GENERATION COMPARISON**

Time Period	10/10/24 TIA (ITE data)			Flagship Car Wash Data			Difference
	Total Trips	New Trips	Pass-By Trips <sup>1</sup>	Total Trips	New Trips	Pass-By Trips <sup>1</sup>	New Trips
Weekday PM Peak Hour of Generator	<i>Not studied</i>			97	49	48	+13 <sup>2</sup>
<b>Weekday PM Commuter Peak Hour</b>	<b>71</b>	<b>36</b>	<b>35</b>	<b>83</b>	<b>42</b>	<b>41</b>	<b>+6</b>
Saturday Peak Hour of Generator	<i>Not studied</i>			153	77	76	+1 <sup>3</sup>
<b>Saturday Midday Peak Hour</b>	<b>152</b>	<b>76</b>	<b>76</b>	<b>152</b>	<b>76</b>	<b>76</b>	<b>0</b>

1. Based on a 50% pass-by rate.
2. Compared the weekday PM commuter peak hour.
3. Compared the Saturday midday peak hour.

As shown in **Table 3**, using the Flagship Car Wash trip generation data results in 6 more new trips than utilized in the 10/10/24 TIA that was based on ITE data for the weekday PM Commuter Peak Hour, and the same Saturday Midday Peak Hour trip generation that was utilized in the 10/10/24 TIA.

## Car Wash Queuing

- » **Car Wash Queuing** - Vehicle queuing approaching the pay station and queuing between the wash tunnel and the pay station were observed on 5-minute intervals during the weekday evening (3:00-7:00 P.M.) and Saturday midday (10:00 A.M.-3:00 P.M.) time periods. This data was also collected on various days in October, November and December 2024. The count data is **attached**.
- » **Summary** – **Table 4** summarizes the peak queuing of each site and calculates an average.

**TABLE 4  
CAR WASH QUEUEING**

Site ID	Location	Size (ksf)	Weekday PM Peak (between 3-7 PM)			Saturday Midday Peak (between 10 AM-3 PM)		
			Pay Station Queue	Pay to Tunnel Queue	Total Queue	Pay Station Queue	Pay to Tunnel Queue	Total Queue
A	Bowie, MD	12.871	4	2	6	16	3	19
B	Waldorf, MD	15.842	16	4	20	15	4	19
C	Gainesville, VA	11.255	7	3	10	10	3	13
D	Herndon, VA	10.992	2	2	4	5	5	10
<b>Average</b>		---	<b>7</b>	<b>3</b>	<b>10</b>	<b>12</b>	<b>4</b>	<b>16</b>

As shown in **Table 4**, the maximum total queuing observed during the peak periods was 20 vehicles, with an average peak queue of 16 vehicles occurring during the Saturday midday peak. Based on the observations, the car wash tunnel operations/speed appeared to control the total queuing.

Per the BL Companies site plan for the Phoenixville site, 10 vehicles are shown a stacking approaching the pay station. In addition, there is staking area between the pay station and the entrance for the car wash tunnel to accommodate 7 vehicles, or a 17 total vehicles in the queue shown on the site plan. Furthermore, there is additional area on-site to accommodate 3 or more vehicles in the queue.

1956 Robert S. Crain Hwy, Bowie, MD 20716  
 12.871 ksf

Day	Time	A1 - Count			A2 - Count			Total	PH check			
		Enter	Enter	Exit	Enter	Exit	Total			Enter	Exit	Rate per ksf
10/30/2024 Wednesday	3:00 PM	13	0	11	13	11	24					
	3:15 PM	12	1	18	13	18	31					
	3:30 PM	11	0	10	11	10	21					
	3:45 PM	8	0	8	8	8	16	92	45	47	7.15	
	4:00 PM	11	0	12	11	12	23	91				
	4:15 PM	12	1	12	13	12	25	85				
	4:30 PM	8	0	7	8	7	15	79				
	4:45 PM	14	0	11	14	11	25	88			6.84	
	5:00 PM	7	0	12	7	12	19	84				
	5:15 PM	9	1	12	10	12	22	81				
	5:30 PM	8	0	11	8	11	19	85				
	5:45 PM	10	1	8	11	8	19	79				
	6:00 PM	8	0	8	8	8	16	76				
	6:15 PM	4	0	6	4	6	10	64				
	6:30 PM	1	0	7	1	7	8	53				
	6:45 PM	0	0	1	0	1	1	35				

Day	Time	A1 - Count			A2 - Count			Total	PH check			
		Enter	Enter	Exit	Enter	Exit	Total			Enter	Exit	Rate per ksf
11/2/2024 Saturday	10:00 AM	17	0	10	17	10	27					
	10:15 AM	14	0	11	14	11	25					
	10:30 AM	20	0	14	20	14	34					
	10:45 AM	14	1	11	15	11	26	112				
	11:00 AM	14	2	17	16	17	33	118				
	11:15 AM	14	1	14	15	14	29	122				
	11:30 AM	15	1	12	16	12	28	116				
	11:45 AM	9	1	20	10	20	30	120				
	12:00 PM	18	0	14	18	14	32	119				
	12:15 PM	8	1	15	9	15	24	114				
	12:30 PM	17	2	12	19	12	31	117				
	12:45 PM	18	1	14	19	14	33	120				
	1:00 PM	23	0	24	23	24	47	135				
	1:15 PM	14	0	18	14	18	32	143				
	1:30 PM	14	1	16	15	16	31	143	71	72	11.11	
	1:45 PM	18	0	12	18	12	30	140				
2:00 PM	7	0	14	7	14	21	114					
2:15 PM	13	0	8	13	8	21	103					
2:30 PM	20	1	19	21	19	40	112					
2:45 PM	15	1	14	16	14	30	112					

Day	Time	A2 - Count (Enter)				Total	A2 - Count (Exit)				Total
		WB Dwy - Th	WB Dwy - Rt	CVS Dwy - LT	CVS Dwy - Th		Vaccum Dwy - Th	Vaccum Dwy - Rt	SB Dwy - Lt	SB Dwy - Th	
10/30/2024	3:00 PM	0	0	0	0	0	3	0	0	8	11
Wednesday	3:15 PM	0	0	0	1	1	4	6	1	7	18
	3:30 PM	0	0	0	0	0	0	2	1	7	10
	3:45 PM	0	0	0	0	0	2	1	1	4	8
	4:00 PM	0	0	0	0	0	1	1	0	10	12
	4:15 PM	0	0	1	0	1	0	5	1	6	12
	4:30 PM	0	0	0	0	0	0	2	0	5	7
	4:45 PM	0	0	0	0	0	1	3	2	5	11
	5:00 PM	0	0	0	0	0	2	3	2	5	12
	5:15 PM	0	0	0	1	1	1	2	1	8	12
	5:30 PM	0	0	0	0	0	1	2	1	7	11
	5:45 PM	0	1	0	0	1	0	2	0	6	8
	6:00 PM	0	0	0	0	0	0	0	1	7	8
	6:15 PM	0	0	0	0	0	1	0	2	3	6
	6:30 PM	0	0	0	0	0	1	1	0	5	7
	6:45 PM	0	0	0	0	0	0	0	0	1	1
Day	Time	A2 - Count (Enter)				Total	A2 - Count (Exit)				Total
		WB Dwy - Th	WB Dwy - Rt	CVS Dwy - LT	CVS Dwy - Th		Vaccum Dwy - Th	Vaccum Dwy - Rt	SB Dwy - Lt	SB Dwy - Th	
11/2/2024	10:00 AM	0	0	0	0	0	0	3	0	7	10
Saturday	10:15 AM	0	0	0	0	0	1	1	2	7	11
	10:30 AM	0	0	0	0	0	0	4	1	9	14
	10:45 AM	0	1	0	0	1	1	1	3	6	11
	11:00 AM	1	0	0	1	2	2	3	1	11	17
	11:15 AM	0	0	1	0	1	2	4	1	7	14
	11:30 AM	0	0	0	1	1	0	1	0	11	12
	11:45 AM	0	0	1	0	1	1	8	1	10	20
	12:00 PM	0	0	0	0	0	0	3	1	10	14
	12:15 PM	0	0	0	1	1	3	1	1	10	15
	12:30 PM	1	0	0	1	2	1	3	1	7	12
	12:45 PM	0	0	0	1	1	0	2	1	11	14
	1:00 PM	0	0	0	0	0	3	6	1	14	24
	1:15 PM	0	0	0	0	0	2	3	3	10	18
	1:30 PM	0	0	1	0	1	3	3	1	9	16
	1:45 PM	0	0	0	0	0	1	2	1	8	12
	2:00 PM	0	0	0	0	0	1	0	1	12	14
	2:15 PM	0	0	0	0	0	1	0	1	6	8
	2:30 PM	0	0	1	0	1	0	5	1	13	19
	2:45 PM	0	1	0	0	1	0	3	1	10	14



Traffic Planning and Design, Inc  
 2500 East High Street  
 Suite 650  
 Pottstown, Pennsylvania, United States 19464  
 610.326.3100 jhainley@trafficpd.com

Count Name: A1 Flagship Car Wash Entrance ATR  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 1

Counter: MIO:  
 Set up By JH::

**Direction (Northbound)**

Start Time	Lights	Other Vehicles	Total
3:00 PM	13	0	13
3:15 PM	12	0	12
3:30 PM	11	0	11
3:45 PM	8	0	8
4:00 PM	11	0	11
4:15 PM	12	0	12
4:30 PM	8	0	8
4:45 PM	14	0	14
5:00 PM	7	0	7
5:15 PM	9	0	9
5:30 PM	8	0	8
5:45 PM	10	0	10
6:00 PM	8	0	8
6:15 PM	4	0	4
6:30 PM	1	0	1
6:45 PM	0	0	0
10:00 AM	17	0	17
10:15 AM	14	0	14
10:30 AM	20	0	20
10:45 AM	14	0	14
11:00 AM	14	0	14
11:15 AM	14	0	14
11:30 AM	15	0	15
11:45 AM	9	0	9
12:00 PM	18	0	18
12:15 PM	8	0	8
12:30 PM	17	0	17
12:45 PM	18	0	18
1:00 PM	23	0	23
1:15 PM	14	0	14
1:30 PM	14	0	14
1:45 PM	18	0	18
2:00 PM	7	0	7
2:15 PM	13	0	13
2:30 PM	20	0	20
2:45 PM	15	0	15
Total	438	0	438
Total %	100.0	0.0	100.0
AM Times	10:00 AM	10:00 AM	10:00 AM

AM Peaks	65	0	65
PM Times	12:30 PM	3:00 PM	12:30 PM
PM Peaks	72	0	72







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

Count Name: A2 Flagship Car  
 Wash Driveway-Vacuum DW Exit  
 & Flagship Driveway-CVS  
 Driveway  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 3

Counter: MIO:  
 Set up By JH::

### Turning Movement Peak Hour Data (3:15 PM)

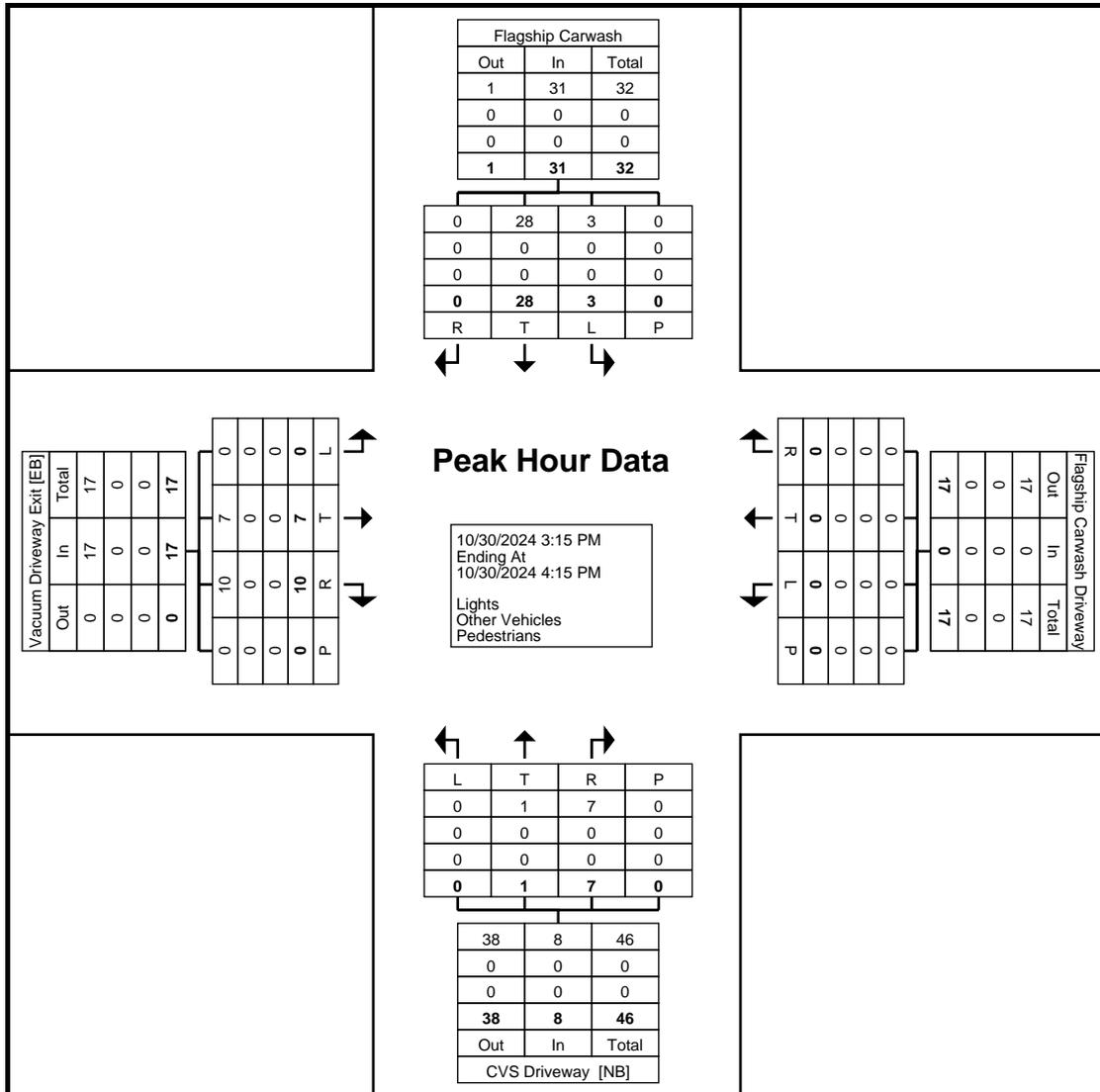
Start Time	Vacuum Driveway Exit Eastbound					Flagship Carwash Driveway Westbound					CVS Driveway Northbound					Flagship Carwash Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
3:15 PM	0	4	6	0	10	0	0	0	0	0	0	1	1	0	2	1	7	0	0	8	20
3:30 PM	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	1	7	0	0	8	11
3:45 PM	0	2	1	0	3	0	0	0	0	0	0	0	1	0	1	1	4	0	0	5	9
4:00 PM	0	1	1	0	2	0	0	0	0	0	0	0	4	0	4	0	10	0	0	10	16
Total	0	7	10	0	17	0	0	0	0	0	0	1	7	0	8	3	28	0	0	31	56
Approach %	0.0	41.2	58.8	-	-	0.0	0.0	0.0	-	-	0.0	12.5	87.5	-	-	9.7	90.3	0.0	-	-	-
Total %	0.0	12.5	17.9	-	30.4	0.0	0.0	0.0	-	0.0	0.0	1.8	12.5	-	14.3	5.4	50.0	0.0	-	55.4	-
PHF	0.000	0.438	0.417	-	0.425	0.000	0.000	0.000	-	0.000	0.000	0.250	0.438	-	0.500	0.750	0.700	0.000	-	0.775	0.700
Lights	0	7	10	-	17	0	0	0	-	0	0	1	7	-	8	3	28	0	-	31	56
% Lights	-	100.0	100.0	-	100.0	-	-	-	-	-	-	100.0	100.0	-	100.0	100.0	100.0	-	-	100.0	100.0
Other Vehicles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Other Vehicles	-	0.0	0.0	-	0.0	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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

Count Name: A2 Flagship Car  
 Wash Driveway-Vacuum DW Exit  
 & Flagship Driveway-CVS  
 Driveway  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 4

Counter: MIO:  
 Set up By JH::



Turning Movement Peak Hour Data Plot (3:15 PM)



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

Count Name: A2 Flagship Car  
 Wash Driveway-Vacuum DW Exit  
 & Flagship Driveway-CVS  
 Driveway  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 5

Counter: MIO:  
 Set up By JH::

### Turning Movement Peak Hour Data (12:45 PM)

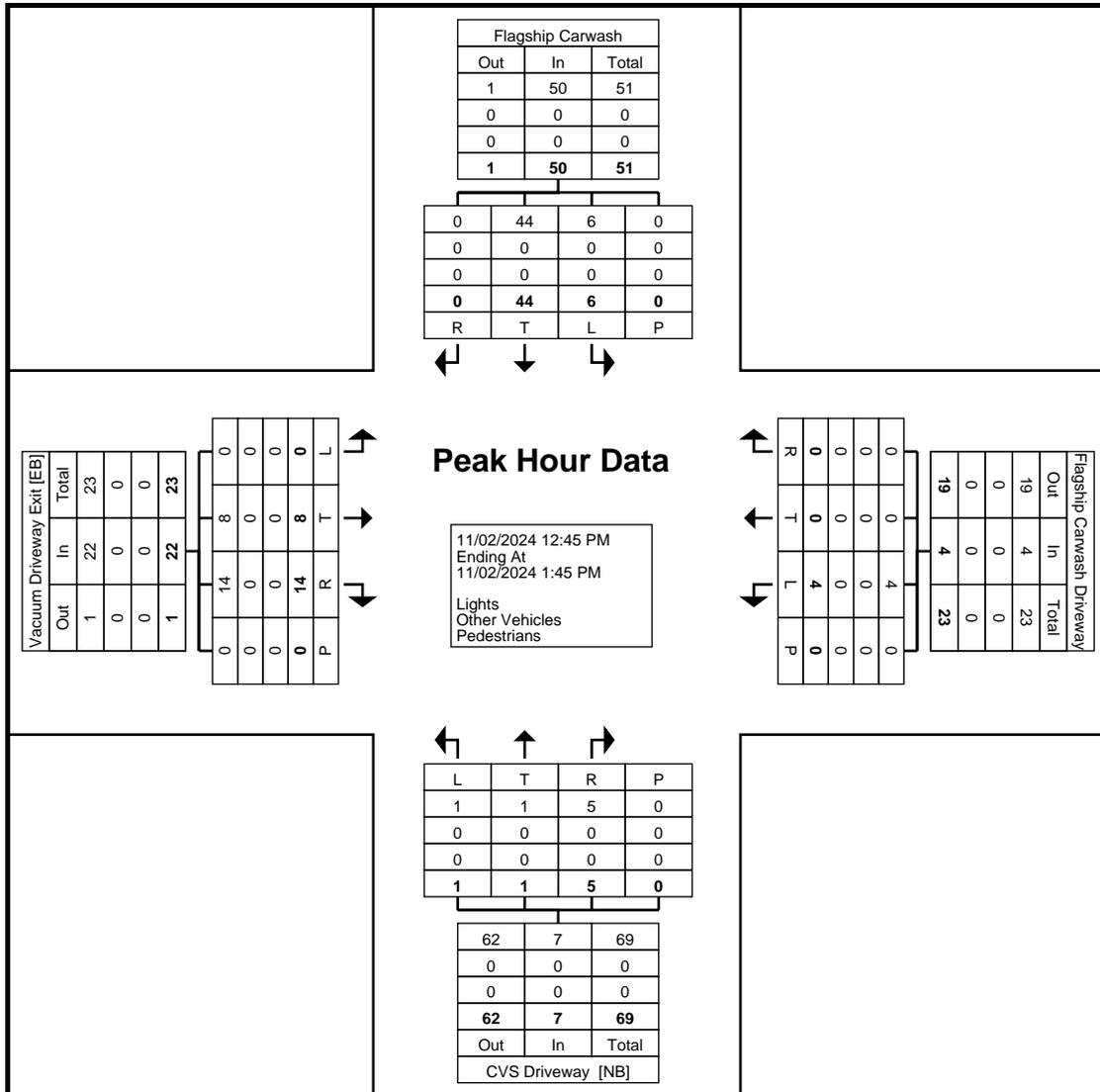
Start Time	Vacuum Driveway Exit Eastbound					Flagship Carwash Driveway Westbound					CVS Driveway Northbound					Flagship Carwash Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
12:45 PM	0	0	2	0	2	0	0	0	0	0	0	1	1	0	2	1	11	0	0	12	16
1:00 PM	0	3	6	0	9	3	0	0	0	3	0	0	0	0	0	1	14	0	0	15	27
1:15 PM	0	2	3	0	5	1	0	0	0	1	0	0	1	0	1	3	10	0	0	13	20
1:30 PM	0	3	3	0	6	0	0	0	0	0	1	0	3	0	4	1	9	0	0	10	20
Total	0	8	14	0	22	4	0	0	0	4	1	1	5	0	7	6	44	0	0	50	83
Approach %	0.0	36.4	63.6	-	-	100.0	0.0	0.0	-	-	14.3	14.3	71.4	-	-	12.0	88.0	0.0	-	-	-
Total %	0.0	9.6	16.9	-	26.5	4.8	0.0	0.0	-	4.8	1.2	1.2	6.0	-	8.4	7.2	53.0	0.0	-	60.2	-
PHF	0.000	0.667	0.583	-	0.611	0.333	0.000	0.000	-	0.333	0.250	0.250	0.417	-	0.438	0.500	0.786	0.000	-	0.833	0.769
Lights	0	8	14	-	22	4	0	0	-	4	1	1	5	-	7	6	44	0	-	50	83
% Lights	-	100.0	100.0	-	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	-	-	100.0	100.0
Other Vehicles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Other Vehicles	-	0.0	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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

Count Name: A2 Flagship Car Wash Driveway-Vacuum DW Exit & Flagship Driveway-CVS Driveway  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 6

Counter: MIO:  
 Set up By JH::



Turning Movement Peak Hour Data Plot (12:45 PM)

155 St. Patrick's Drive, Waldorf, MD  
15.842 ksf

Day	Time	B1 - Count		Total		PH check				
		Enter	Exit	Enter	Exit	Total	Enter	Exit	Rate per ksf	
10/30/2024 Wednesday	3:00 PM	29	19	29	19	48				
	3:15 PM	18	14	18	14	32				
	3:30 PM	17	18	17	18	35				
	3:45 PM	14	21	14	21	35	150	78	72	9.47
	4:00 PM	10	20	10	20	30	132			
	4:15 PM	14	17	14	17	31	131			
	4:30 PM	12	9	12	9	21	117			
	4:45 PM	13	12	13	12	25	107			
	5:00 PM	19	17	19	17	36	113			
	5:15 PM	19	19	19	19	38	120			
	5:30 PM	14	15	14	15	29	128			8.08
	5:45 PM	11	13	11	13	24	127			
	6:00 PM	9	11	9	11	20	111			
	6:15 PM	1	8	1	8	9	82			
	6:30 PM	1	8	1	8	9	62			
	6:45 PM	0	0	0	0	0	38			

Day	Time	B1 - Count		Total		PH check				
		Enter	Exit	Enter	Exit	Total	Enter	Exit	Rate per ksf	
11/2/2024 Saturday	10:00 AM	21	33	21	33	54				
	10:15 AM	43	18	43	18	61				
	10:30 AM	31	33	31	33	64				
	10:45 AM	30	37	30	37	67	246	125	121	15.53
	11:00 AM	20	30	20	30	50	242			
	11:15 AM	29	26	29	26	55	236			
	11:30 AM	24	27	24	27	51	223			
	11:45 AM	28	22	28	22	50	206			
	12:00 PM	18	24	18	24	42	198			
	12:15 PM	38	24	38	24	62	205			
	12:30 PM	31	29	31	29	60	214			
	12:45 PM	23	33	23	33	56	220			
	1:00 PM	35	24	35	24	59	237			
	1:15 PM	29	34	29	34	63	238			15.02
	1:30 PM	26	28	26	28	54	232			
	1:45 PM	25	32	25	32	57	233			
2:00 PM	27	33	27	33	60	234				
2:15 PM	30	23	30	23	53	224				
2:30 PM	28	28	28	28	56	226				
2:45 PM	27	25	27	25	52	221				

155 St. Patrick's Drive, Waldorf, MD

Day	Time	Enter		Exit			Total
		NB App Total	Total	Tunnel - Rt	WB Lt	SB - Thru	
10/30/2024	3:00 PM	29	29	2	2	15	19
Wednesday	3:15 PM	18	18	1	0	13	14
	3:30 PM	17	17	0	3	15	18
	3:45 PM	14	14	1	0	20	21
	4:00 PM	10	10	2	1	17	20
	4:15 PM	14	14	1	0	16	17
	4:30 PM	12	12	0	0	9	9
	4:45 PM	13	13	1	0	11	12
	5:00 PM	19	19	0	0	17	17
	5:15 PM	19	19	0	1	18	19
	5:30 PM	14	14	1	0	14	15
	5:45 PM	11	11	0	0	13	13
	6:00 PM	9	9	0	1	10	11
	6:15 PM	1	1	0	0	8	8
	6:30 PM	1	1	1	0	7	8
	6:45 PM	0	0	0	0	0	0
Day	Time	Enter		Exit			Total
		NB App Total	Total	Tunnel - Rt	WB Lt	SB - Thru	Total
11/2/2024	10:00 AM	21	21	3	0	30	33
Saturday	10:15 AM	43	43	0	0	18	18
	10:30 AM	31	31	1	0	32	33
	10:45 AM	30	30	1	0	36	37
	11:00 AM	20	20	0	0	30	30
	11:15 AM	29	29	3	0	23	26
	11:30 AM	24	24	1	0	26	27
	11:45 AM	28	28	2	1	19	22
	12:00 PM	18	18	0	0	24	24
	12:15 PM	38	38	0	0	24	24
	12:30 PM	31	31	1	1	27	29
	12:45 PM	23	23	2	0	31	33
	1:00 PM	35	35	0	1	23	24
	1:15 PM	29	29	0	0	34	34
	1:30 PM	26	26	0	0	28	28
	1:45 PM	25	25	0	1	31	32
	2:00 PM	27	27	2	0	31	33
	2:15 PM	30	30	0	0	23	23
2:30 PM	28	28	2	1	25	28	
2:45 PM	27	27	1	2	22	25	



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

Count Name: Flagship  
 Carwash Driveway 155 St. Patrick's  
 Drive, Waldorf, MD.  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 1

Counter: MIO:  
 Set up By JH::

### Turning Movement Data

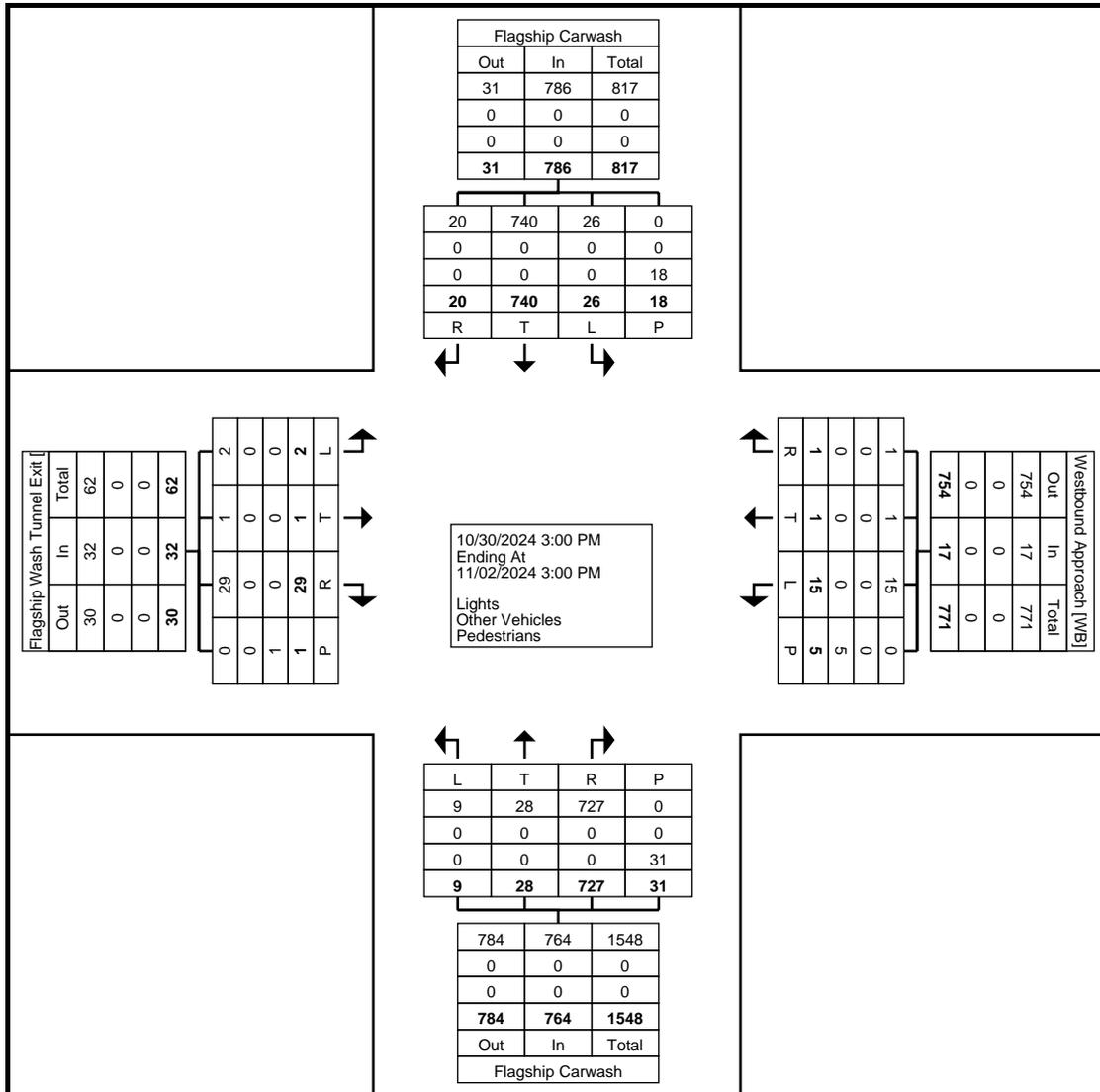
Start Time	Flagship Wash Tunnel Exit Eastbound					Westbound Approach Westbound					Flagship Carwash Driveway Northbound					Flagship Carwash Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
	3:00 PM	0	1	2	0	3	2	0	0	0	2	0	2	27	1	29	1	15	0	3	
3:15 PM	0	0	1	0	1	0	0	0	0	0	1	4	13	0	18	1	13	0	0	14	33
3:30 PM	0	0	0	0	0	3	0	0	0	3	0	1	16	0	17	1	15	0	1	16	36
3:45 PM	0	0	1	0	1	0	0	0	0	0	1	2	11	1	14	1	20	0	0	21	36
Hourly Total	0	1	4	0	5	5	0	0	0	5	2	9	67	2	78	4	63	0	4	67	155
4:00 PM	0	0	2	0	2	1	0	0	0	1	1	0	9	1	10	1	17	0	0	18	31
4:15 PM	0	0	1	0	1	0	0	0	0	0	0	1	13	3	14	1	16	0	0	17	32
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12	3	9	1	0	13	25
4:45 PM	0	0	1	0	1	0	0	0	0	0	1	1	11	0	13	0	11	0	0	11	25
Hourly Total	0	0	4	0	4	1	0	0	0	1	2	2	45	4	49	5	53	1	0	59	113
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	19	0	19	0	17	0	0	17	36
5:15 PM	0	0	0	0	0	1	0	0	0	1	1	1	17	0	19	0	18	0	0	18	38
5:30 PM	0	0	1	0	1	0	0	0	0	0	0	1	13	2	14	1	14	0	4	15	30
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	11	1	11	0	13	0	0	13	24
Hourly Total	0	0	1	0	1	1	0	0	0	1	1	2	60	3	63	1	62	0	4	63	128
6:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	9	1	9	0	10	0	3	10	20
6:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	1	1	1	0	8	0	2	8	9
6:30 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	3	1	0	7	0	5	7	9
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Hourly Total	0	0	1	0	1	1	0	0	2	1	0	1	10	7	11	0	25	0	10	25	38
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	0	0	3	0	3	0	0	1	0	1	0	0	21	2	21	0	30	0	0	30	55
10:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	43	0	43	0	18	1	0	19	62
10:30 AM	0	0	1	0	1	0	0	0	0	0	0	2	29	3	31	0	32	0	0	32	64
10:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	30	1	30	0	36	3	0	39	70
Hourly Total	0	0	5	1	5	0	0	1	0	1	0	2	123	6	125	0	116	4	0	120	251
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	1	30	0	0	31	51
11:15 AM	0	0	3	0	3	0	0	0	0	0	0	0	29	0	29	0	23	3	0	26	58
11:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	24	0	24	0	26	2	0	28	53
11:45 AM	0	0	2	0	2	1	0	0	0	1	1	4	23	0	28	1	19	1	0	21	52
Hourly Total	0	0	6	0	6	1	0	0	0	1	1	4	96	0	101	2	98	6	0	106	214
12:00 PM	0	0	0	0	0	0	1	0	1	1	1	0	17	1	18	3	24	1	0	28	47
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	38	0	38	3	24	1	0	28	66
12:30 PM	0	0	1	0	1	1	0	0	0	1	0	1	30	0	31	2	27	0	0	29	62
12:45 PM	0	0	2	0	2	0	0	0	0	0	2	1	20	1	23	4	31	0	0	35	60
Hourly Total	0	0	3	0	3	1	1	0	1	2	3	2	105	2	110	12	106	2	0	120	235
1:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	35	2	35	0	23	2	0	25	61
1:15 PM	1	0	0	0	1	0	0	0	0	0	0	1	28	1	29	1	34	0	0	35	65
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	26	0	26	0	28	0	0	28	54
1:45 PM	0	0	0	0	0	1	0	0	0	1	0	0	25	0	25	0	31	1	0	32	58
Hourly Total	1	0	0	0	1	2	0	0	0	2	0	1	114	3	115	1	116	3	0	120	238
2:00 PM	0	0	2	0	2	0	0	0	0	0	0	3	24	2	27	0	31	2	0	33	62
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	30	0	30	0	23	0	0	23	53
2:30 PM	1	0	2	0	3	1	0	0	1	1	0	0	28	1	28	1	25	2	0	28	60
2:45 PM	0	0	1	0	1	2	0	0	1	2	0	2	25	1	27	0	22	0	0	22	52
Hourly Total	1	0	5	0	6	3	0	0	2	3	0	5	107	4	112	1	101	4	0	106	227
Grand Total	2	1	29	1	32	15	1	1	5	17	9	28	727	31	764	26	740	20	18	786	1599
Approach %	6.3	3.1	90.6	-	-	88.2	5.9	5.9	-	-	1.2	3.7	95.2	-	-	3.3	94.1	2.5	-	-	-
Total %	0.1	0.1	1.8	-	2.0	0.9	0.1	0.1	-	1.1	0.6	1.8	45.5	-	47.8	1.6	46.3	1.3	-	49.2	-
Lights	2	1	29	-	32	15	1	1	-	17	9	28	727	-	764	26	740	20	-	786	1599
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0
Other Vehicles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Other Vehicles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	1	-	-	-	-	5	-	-	-	-	31	-	-	-	-	18	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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

Count Name: Flagship  
 Carwash Driveway 155 St. Patrick's  
 Drive, Waldord, MD.  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 2

Counter: MIO:  
 Set up By JH::



Turning Movement Data Plot



Traffic Planning and Design, Inc  
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Count Name: Flagship  
 Carwash Driveway 155 St. Patrick's  
 Drive, Waldorf, MD.  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 3

Counter: MIO:  
 Set up By JH::

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

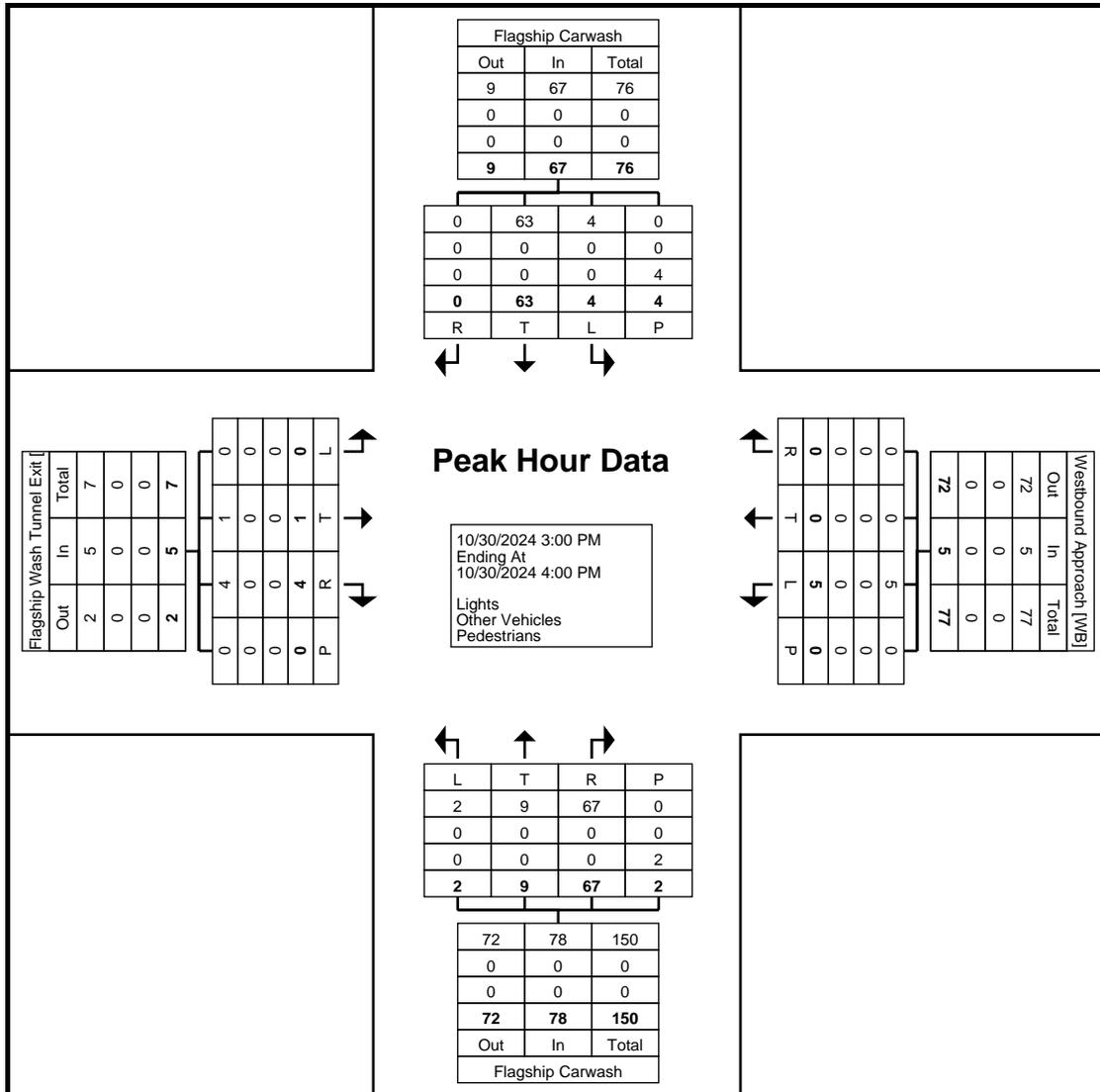
Start Time	Flagship Wash Tunnel Exit Eastbound					Westbound Approach Westbound					Flagship Carwash Driveway Northbound					Flagship Carwash Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
3:00 PM	0	1	2	0	3	2	0	0	0	2	0	2	27	1	29	1	15	0	3	16	50
3:15 PM	0	0	1	0	1	0	0	0	0	0	1	4	13	0	18	1	13	0	0	14	33
3:30 PM	0	0	0	0	0	3	0	0	0	3	0	1	16	0	17	1	15	0	1	16	36
3:45 PM	0	0	1	0	1	0	0	0	0	0	1	2	11	1	14	1	20	0	0	21	36
Total	0	1	4	0	5	5	0	0	0	5	2	9	67	2	78	4	63	0	4	67	155
Approach %	0.0	20.0	80.0	-	-	100.0	0.0	0.0	-	-	2.6	11.5	85.9	-	-	6.0	94.0	0.0	-	-	-
Total %	0.0	0.6	2.6	-	3.2	3.2	0.0	0.0	-	3.2	1.3	5.8	43.2	-	50.3	2.6	40.6	0.0	-	43.2	-
PHF	0.000	0.250	0.500	-	0.417	0.417	0.000	0.000	-	0.417	0.500	0.563	0.620	-	0.672	1.000	0.788	0.000	-	0.798	0.775
Lights	0	1	4	-	5	5	0	0	-	5	2	9	67	-	78	4	63	0	-	67	155
% Lights	-	100.0	100.0	-	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	-	-	100.0	100.0
Other Vehicles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Other Vehicles	-	0.0	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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 Suite 650  
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Count Name: Flagship  
 Carwash Driveway 155 St. Patrick's  
 Drive, Waldorf, MD.  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 4

Counter: MIO:  
 Set up By JH::



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



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

Count Name: Flagship  
 Carwash Driveway 155 St. Patrick's  
 Drive, Waldorf, MD.  
 Site Code:  
 Start Date: 10/30/2024  
 Page No: 5

Counter: MIO:  
 Set up By JH::

### Turning Movement Peak Hour Data (10:00 AM)

Start Time	Flagship Wash Tunnel Exit Eastbound					Westbound Approach Westbound					Flagship Carwash Driveway Northbound					Flagship Carwash Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
	10:00 AM	0	0	3	0	3	0	0	1	0	1	0	0	21	2	21	0	30	0	0	
10:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	43	0	43	0	18	1	0	19	62
10:30 AM	0	0	1	0	1	0	0	0	0	0	0	2	29	3	31	0	32	0	0	32	64
10:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	30	1	30	0	36	3	0	39	70
Total	0	0	5	1	5	0	0	1	0	1	0	2	123	6	125	0	116	4	0	120	251
Approach %	0.0	0.0	100.0	-	-	0.0	0.0	100.0	-	-	0.0	1.6	98.4	-	-	0.0	96.7	3.3	-	-	-
Total %	0.0	0.0	2.0	-	2.0	0.0	0.0	0.4	-	0.4	0.0	0.8	49.0	-	49.8	0.0	46.2	1.6	-	47.8	-
PHF	0.000	0.000	0.417	-	0.417	0.000	0.000	0.250	-	0.250	0.000	0.250	0.715	-	0.727	0.000	0.806	0.333	-	0.769	0.896
Lights	0	0	5	-	5	0	0	1	-	1	0	2	123	-	125	0	116	4	-	120	251
% Lights	-	-	100.0	-	100.0	-	-	100.0	-	100.0	-	100.0	100.0	-	100.0	-	100.0	100.0	-	100.0	100.0
Other Vehicles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Other Vehicles	-	-	0.0	-	0.0	-	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



14570 Lee Hwy, Gainesville, VA 20155  
 11.255 ksf

Day	Time	C1 - Count		Total		PH check				
		Enter	Exit	Enter	Exit		Total	Enter	Exit	Rate per ksf
12/5/2024	3:00 PM	10	9	10	9	19				
Thursday	3:15 PM	11	7	11	7	18				
	3:30 PM	16	15	16	15	31				
	3:45 PM	10	15	10	15	25	93			
	4:00 PM	10	13	10	13	23	97	Enter	Exit	Rate per ksf
	4:15 PM	13	13	13	13	26	105	49	56	9.33
	4:30 PM	7	13	7	13	20	94			
	4:45 PM	12	7	12	7	19	88			7.82
	5:00 PM	6	11	6	11	17	82			
	5:15 PM	4	6	4	6	10	66			
	5:30 PM	4	2	4	2	6	52			
	5:45 PM	3	5	3	5	8	41			
	6:00 PM	4	4	4	4	8	32			
	6:15 PM	2	1	2	1	3	25			
	6:30 PM	2	6	2	6	8	27			
	6:45 PM	0	3	0	3	3	22			

Day	Time	C1 - Count		Total		PH check				
		Enter	Exit	Enter	Exit		Total	Enter	Exit	Rate per ksf
12/7/2024	10:00 AM	23	18	23	18	41				
Saturday	10:15 AM	14	19	14	19	33				
	10:30 AM	20	15	20	15	35				
	10:45 AM	13	18	13	18	31	140			
	11:00 AM	20	17	20	17	37	136			
	11:15 AM	21	17	21	17	38	141			
	11:30 AM	21	16	21	16	37	143			
	11:45 AM	17	19	17	19	36	148			
	12:00 PM	21	22	21	22	43	154			
	12:15 PM	14	18	14	18	32	148			
	12:30 PM	17	21	17	21	38	149			
	12:45 PM	21	20	21	20	41	154			
	1:00 PM	22	21	22	21	43	154	Enter	Exit	Rate per ksf
	1:15 PM	17	19	17	19	36	158	77	81	14.04
	1:30 PM	14	13	14	13	27	147			
	1:45 PM	21	19	21	19	40	146			
	2:00 PM	18	19	18	19	37	140			
	2:15 PM	14	20	14	20	34	138			
	2:30 PM	19	16	19	16	35	146			
	2:45 PM	13	19	13	19	32	138			



C1

Traffic Planning and Design, Inc  
2500 East High Street  
Suite 650  
Pottstown, Pennsylvania, United States 19464  
610.326.3100 jhainley@trafficpd.com

Count Name: Flagship Carwash ATR  
Site Code:  
Start Date: 12/05/2024  
Page No: 1

Counter: MIO:  
Set up By JH::

**Direction (Westbound)**

Start Time	Lights	Other Vehicles	Total
3:00 PM	9	0	9
3:15 PM	7	0	7
3:30 PM	15	0	15
3:45 PM	15	0	15
4:00 PM	13	0	13
4:15 PM	13	0	13
4:30 PM	13	0	13
4:45 PM	7	0	7
5:00 PM	11	0	11
5:15 PM	6	0	6
5:30 PM	2	0	2
5:45 PM	5	0	5
6:00 PM	4	0	4
6:15 PM	1	0	1
6:30 PM	6	0	6
6:45 PM	3	0	3
10:00 AM	18	0	18
10:15 AM	19	0	19
10:30 AM	15	0	15
10:45 AM	18	0	18
11:00 AM	17	0	17
11:15 AM	17	0	17
11:30 AM	16	0	16
11:45 AM	19	0	19
12:00 PM	22	0	22
12:15 PM	18	0	18
12:30 PM	21	0	21
12:45 PM	20	0	20
1:00 PM	21	0	21
1:15 PM	19	0	19
1:30 PM	13	0	13
1:45 PM	19	0	19
2:00 PM	19	0	19
2:15 PM	20	0	20
2:30 PM	16	0	16
2:45 PM	19	0	19
Total	496	0	496
Total %	100.0	0.0	100.0
AM Times	11:00 AM	10:00 AM	11:00 AM

AM Peaks	69	0	69
PM Times	12:30 PM	3:00 PM	12:30 PM
PM Peaks	81	0	81



C1

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610.326.3100 jhainley@trafficpd.com

Count Name: Flagship Carwash ATR  
Site Code:  
Start Date: 12/05/2024  
Page No: 3

Counter: MIO:  
Set up By JH::

**Direction (Eastbound)**

Start Time	Lights	Other Vehicles	Total
3:00 PM	10	0	10
3:15 PM	11	0	11
3:30 PM	16	0	16
3:45 PM	10	0	10
4:00 PM	10	0	10
4:15 PM	13	0	13
4:30 PM	7	0	7
4:45 PM	12	0	12
5:00 PM	6	0	6
5:15 PM	4	0	4
5:30 PM	4	0	4
5:45 PM	3	0	3
6:00 PM	4	0	4
6:15 PM	2	0	2
6:30 PM	2	0	2
6:45 PM	0	0	0
10:00 AM	23	0	23
10:15 AM	14	0	14
10:30 AM	20	0	20
10:45 AM	13	0	13
11:00 AM	20	0	20
11:15 AM	21	0	21
11:30 AM	21	0	21
11:45 AM	17	0	17
12:00 PM	21	0	21
12:15 PM	14	0	14
12:30 PM	17	0	17
12:45 PM	21	0	21
1:00 PM	22	0	22
1:15 PM	17	0	17
1:30 PM	14	0	14
1:45 PM	21	0	21
2:00 PM	18	0	18
2:15 PM	14	0	14
2:30 PM	19	0	19
2:45 PM	13	0	13
Total	474	0	474
Total %	100.0	0.0	100.0
AM Times	11:00 AM	10:00 AM	11:00 AM

AM Peaks	79	0	79
PM Times	12:30 PM	3:00 PM	12:30 PM
PM Peaks	77	0	77

632 Grant Street, Herndon, VA 20170

10.992 ksf

Day	Time	D1 - Count		D2 - Count		D2 Count		Total	PH check			
		Exit	Enter	Exit	Enter	Exit	Enter			Exit	Total	Enter
12/5/2024 Thursday	3:00 PM	2	8	7	8	9	8	17				
	3:15 PM	3	10	5	10	8	10	18				
	3:30 PM	7	9	8	9	15	9	24				
	3:45 PM	5	17	2	17	7	17	24	83			
	4:00 PM	7	9	8	9	15	9	24	90			
	4:15 PM	5	7	6	7	11	7	18	90	42	48	8.19
	4:30 PM	2	8	1	8	3	8	11	77			
	4:45 PM	4	9	7	9	11	9	20	73			6.64
	5:00 PM	4	10	3	10	7	10	17	66			
	5:15 PM	2	5	3	5	5	5	10	58			
	5:30 PM	3	3	6	3	9	3	12	59			
	5:45 PM	3	8	5	8	8	8	16	55			
	6:00 PM	0	2	4	2	4	2	6	44			
	6:15 PM	0	3	3	3	3	3	6	40			
	6:30 PM	1	0	1	0	2	0	2	30			
6:45 PM	0	0	0	0	0	0	0	14				

Day	Time	D1 - Count		D2 - Count		D2 Count		Total	PH check			
		Exit	Enter	Exit	Enter	Exit	Enter			Exit	Total	Enter
12/7/2024 Saturday	10:00 AM	5	16	13	16	18	16	34				
	10:15 AM	7	13	11	13	18	13	31				
	10:30 AM	3	13	13	13	16	13	29				
	10:45 AM	6	13	9	13	15	13	28	122			
	11:00 AM	8	15	10	15	18	15	33	121			
	11:15 AM	4	17	8	17	12	17	29	119			
	11:30 AM	9	22	7	22	16	22	38	128			
	11:45 AM	7	17	14	17	21	17	38	138			
	12:00 PM	6	17	12	17	18	17	35	140			
	12:15 PM	5	16	13	16	18	16	34	145			
	12:30 PM	0	16	14	16	14	16	30	137			
	12:45 PM	12	22	13	22	25	22	47	146	71	75	13.28
	1:00 PM	5	12	14	12	19	12	31	142			
	1:15 PM	4	17	9	17	13	17	30	138			
	1:30 PM	7	18	12	18	19	18	37	145			
1:45 PM	5	11	9	11	14	11	25	123				
2:00 PM	7	18	12	18	19	18	37	129				
2:15 PM	9	14	10	14	19	14	33	132				
2:30 PM	6	16	6	16	12	16	28	123				
2:45 PM	6	18	9	18	15	18	33	131				



D1

Traffic Planning and Design, Inc  
 2500 East High Street  
 Suite 650  
 Pottstown, Pennsylvania, United States 19464  
 610.326.3100 jhainley@trafficpd.com

Counter: MIO:  
 Set up By JH::

Count Name: Flagship Carwash ATR Exit  
 Site Code:  
 Start Date: 12/05/2024  
 Page No: 1

**Direction (Northbound)**

Start Time	Lights	Other Vehicles	Total
3:00 PM	2	0	2
3:15 PM	3	0	3
3:30 PM	7	0	7
3:45 PM	5	0	5
4:00 PM	7	0	7
4:15 PM	5	0	5
4:30 PM	2	0	2
4:45 PM	4	0	4
5:00 PM	4	0	4
5:15 PM	2	0	2
5:30 PM	3	0	3
5:45 PM	3	0	3
6:00 PM	0	0	0
6:15 PM	0	0	0
6:30 PM	1	0	1
6:45 PM	0	0	0
10:00 AM	5	0	5
10:15 AM	7	0	7
10:30 AM	3	0	3
10:45 AM	6	0	6
11:00 AM	8	0	8
11:15 AM	4	0	4
11:30 AM	9	0	9
11:45 AM	7	0	7
12:00 PM	6	0	6
12:15 PM	5	0	5
12:30 PM	0	0	0
12:45 PM	12	0	12
1:00 PM	5	0	5
1:15 PM	4	0	4
1:30 PM	7	0	7
1:45 PM	5	0	5
2:00 PM	7	0	7
2:15 PM	9	0	9
2:30 PM	6	0	6
2:45 PM	6	0	6
Total	169	0	169
Total %	100.0	0.0	100.0
AM Times	11:00 AM	10:00 AM	11:00 AM

AM Peaks	28	0	28
PM Times	12:45 PM	3:00 PM	12:45 PM
PM Peaks	28	0	28



D2 - Enter

Traffic Planning and Design, Inc  
 2500 East High Street  
 Suite 650  
 Pottstown, Pennsylvania, United States 19464  
 610.326.3100 jhainley@trafficpd.com

Counter: MIO:  
 Set up By JH::

Count Name: Flagship Carwash ATR (Enter)  
 Site Code:  
 Start Date: 12/05/2024  
 Page No: 1

**Direction (Eastbound)**

Start Time	Lights	Other Vehicles	Total
3:00 PM	8	0	8
3:15 PM	10	0	10
3:30 PM	9	0	9
3:45 PM	17	0	17
4:00 PM	9	0	9
4:15 PM	7	0	7
4:30 PM	8	0	8
4:45 PM	9	0	9
5:00 PM	10	0	10
5:15 PM	5	0	5
5:30 PM	3	0	3
5:45 PM	8	0	8
6:00 PM	2	0	2
6:15 PM	3	0	3
6:30 PM	0	0	0
6:45 PM	0	0	0
10:00 AM	16	0	16
10:15 AM	13	0	13
10:30 AM	13	0	13
10:45 AM	13	0	13
11:00 AM	15	0	15
11:15 AM	17	0	17
11:30 AM	22	0	22
11:45 AM	17	0	17
12:00 PM	17	0	17
12:15 PM	16	0	16
12:30 PM	16	0	16
12:45 PM	22	0	22
1:00 PM	12	0	12
1:15 PM	17	0	17
1:30 PM	18	0	18
1:45 PM	11	0	11
2:00 PM	18	0	18
2:15 PM	14	0	14
2:30 PM	16	0	16
2:45 PM	18	0	18
Total	429	0	429
Total %	100.0	0.0	100.0
AM Times	11:00 AM	10:00 AM	11:00 AM

D2 - Enter

AM Peaks	71	0	71
PM Times	12:00 PM	3:00 PM	12:00 PM
PM Peaks	71	0	71



D2 - Exit

Traffic Planning and Design, Inc  
 2500 East High Street  
 Suite 650  
 Pottstown, Pennsylvania, United States 19464  
 610.326.3100 jhainley@trafficpd.com

Count Name: Flagship Carwash ATR (Dry  
 Tunnel/Detailing Exit)  
 Site Code:  
 Start Date: 12/05/2024  
 Page No: 1

Counter: MIO:  
 Set up By JH::

**Direction (Northbound)**

Start Time	Lights	Other Vehicles	Total
3:00 PM	7	0	7
3:15 PM	5	0	5
3:30 PM	8	0	8
3:45 PM	2	0	2
4:00 PM	8	0	8
4:15 PM	6	0	6
4:30 PM	1	0	1
4:45 PM	7	0	7
5:00 PM	3	0	3
5:15 PM	3	0	3
5:30 PM	6	0	6
5:45 PM	5	0	5
6:00 PM	4	0	4
6:15 PM	3	0	3
6:30 PM	1	0	1
6:45 PM	0	0	0
10:00 AM	13	0	13
10:15 AM	11	0	11
10:30 AM	13	0	13
10:45 AM	9	0	9
11:00 AM	10	0	10
11:15 AM	8	0	8
11:30 AM	7	0	7
11:45 AM	14	0	14
12:00 PM	12	0	12
12:15 PM	13	0	13
12:30 PM	14	0	14
12:45 PM	13	0	13
1:00 PM	14	0	14
1:15 PM	9	0	9
1:30 PM	12	0	12
1:45 PM	9	0	9
2:00 PM	12	0	12
2:15 PM	10	0	10
2:30 PM	6	0	6
2:45 PM	9	0	9
Total	287	0	287
Total %	100.0	0.0	100.0
AM Times	10:00 AM	10:00 AM	10:00 AM

## D2 - Exit

AM Peaks	46	0	46
PM Times	12:15 PM	3:00 PM	12:15 PM
PM Peaks	54	0	54

1956 Robert S. Crain Hwy, Bowie, MD 20716  
12.871 ksf

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
10/30/2024	3:00 PM	0	2	2
Wednesday	3:05 PM	1	2	3
	3:10 PM	1	1	2
	3:15 PM	0	1	1
	3:20 PM	0	0	0
	3:25 PM	0	1	1
	3:30 PM	1	0	1
	3:35 PM	1	1	2
	3:40 PM	0	2	2
	3:45 PM	0	0	0
	3:50 PM	0	2	2
	3:55 PM	0	1	1
	4:00 PM	1	0	1
	4:05 PM	2	0	2
	4:10 PM	1	2	3
	4:15 PM	0	1	1
	4:20 PM	0	0	0
	4:25 PM	2	0	2
	4:30 PM	2	2	4
	4:35 PM	2	3	5
	4:40 PM	0	2	2
	4:45 PM	0	0	0
	4:50 PM	4	2	6
	4:55 PM	2	2	4
	5:00 PM	0	2	2
	5:05 PM	0	0	0
	5:10 PM	0	0	0
	5:15 PM	0	0	0
	5:20 PM	2	0	2
	5:25 PM	2	1	3
	5:30 PM	1	0	1
	5:35 PM	0	0	0
	5:40 PM	0	1	1
	5:45 PM	1	0	1
	5:50 PM	1	2	3
	5:55 PM	0	0	0
	6:00 PM	1	0	1

1956 Robert S. Crain Hwy, Bowie, MD 20716

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
11/2/2024	10:00 AM	2	0	2
Saturday	10:05 AM	3	2	5
	10:10 AM	5	2	7
	10:15 AM	7	2	9
	10:20 AM	6	2	8
	10:25 AM	10	2	12
	10:30 AM	8	3	11
	10:35 AM	9	2	11
	10:40 AM	9	3	12
	10:45 AM	9	4	13
	10:50 AM	12	3	15
	10:55 AM	9	3	12
	11:00 AM	13	2	15
	11:05 AM	13	2	15
	11:10 AM	14	2	16
	11:15 AM	11	3	14
	11:20 AM	12	3	15
	11:25 AM	13	2	15
	11:30 AM	11	3	14
	11:35 AM	10	3	13
	11:40 AM	5	3	8
	11:45 AM	7	3	10
	11:50 AM	8	3	11
	11:55 AM	8	3	11
	12:00 PM	8	3	11
	12:05 PM	7	3	10
	12:10 PM	9	3	12
	12:15 PM	10	3	13
	12:20 PM	9	3	12
	12:25 PM	8	3	11
	12:30 PM	9	3	12
	12:35 PM	7	3	10
	12:40 PM	5	3	8
	12:45 PM	7	3	10
	12:50 PM	9	3	12
	12:55 PM	6	3	9
	1:00 PM	6	3	9
	1:05 PM	10	3	13
	1:10 PM	15	3	18
	1:15 PM	12	3	15
	1:20 PM	10	3	13
	1:25 PM	9	3	12
	1:30 PM	9	3	12
	1:35 PM	7	3	10
	1:40 PM	6	2	8
	1:45 PM	16	3	19
	1:50 PM	13	3	16
	1:55 PM	13	3	16
	2:00 PM	11	3	14
	2:05 PM	10	3	13
	2:10 PM	12	3	15
	2:15 PM	15	3	18
	2:20 PM	12	3	15
	2:25 PM	10	3	13
	2:30 PM	8	3	11
	2:35 PM	10	3	13
	2:40 PM	15	3	18
	2:45 PM	14	3	17
	2:50 PM	12	3	15
	2:55 PM	9	3	12
	3:00 PM	7	3	10

155 St. Patrick's Drive, Waldorf, MD  
15.842 ksf

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
10/30/2024	3:00 PM	1	1	2
Wednesday	3:05 PM	2	3	5
	3:10 PM	6	3	9
	3:15 PM	14	3	17
	3:20 PM	14	4	18
	3:25 PM	16	3	19
	3:30 PM	16	4	20
	3:35 PM	15	4	19
	3:40 PM	12	3	15
	3:45 PM	13	3	16
	3:50 PM	11	4	15
	3:55 PM	6	3	9
	4:00 PM	6	4	10
	4:05 PM	0	3	3
	4:10 PM	1	0	1
	4:15 PM	1	1	2
	4:20 PM	0	0	0
	4:25 PM	0	0	0
	4:30 PM	1	0	1
	4:35 PM	0	0	0
	4:40 PM	3	1	4
	4:45 PM	5	1	6
	4:50 PM	0	3	3
	4:55 PM	2	0	2
	5:00 PM	0	0	0
	5:05 PM	1	1	2
	5:10 PM	1	1	2
	5:15 PM	1	2	3
	5:20 PM	1	1	2
	5:25 PM	0	0	0
	5:30 PM	2	4	6
	5:35 PM	2	0	2
	5:40 PM	1	2	3
	5:45 PM	2	0	2
	5:50 PM	1	0	1
	5:55 PM	1	1	2
	6:00 PM	0	0	0

155 St. Patrick's Drive, Waldorf, MD

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
11/2/2024	10:00 AM	4	2	6
Saturday	10:05 AM	3	2	5
	10:10 AM	4	2	6
	10:15 AM	0	0	0
	10:20 AM	5	4	9
	10:25 AM	8	3	11
	10:30 AM	7	3	10
	10:35 AM	6	3	9
	10:40 AM	9	0	9
	10:45 AM	7	3	10
	10:50 AM	8	3	11
	10:55 AM	13	3	16
	11:00 AM	4	3	7
	11:05 AM	4	2	6
	11:10 AM	3	1	4
	11:15 AM	0	1	1
	11:20 AM	2	1	3
	11:25 AM	2	1	3
	11:30 AM	3	1	4
	11:35 AM	1	1	2
	11:40 AM	3	2	5
	11:45 AM	8	0	8
	11:50 AM	8	0	8
	11:55 AM	2	3	5
	12:00 PM	3	3	6
	12:05 PM	2	1	3
	12:10 PM	0	0	0
	12:15 PM	2	1	3
	12:20 PM	4	1	5
	12:25 PM	11	3	14
	12:30 PM	9	4	13
	12:35 PM	15	4	19
	12:40 PM	12	3	15
	12:45 PM	10	4	14
	12:50 PM	9	2	11
	12:55 PM	6	1	7
	1:00 PM	4	3	7
	1:05 PM	12	3	15
	1:10 PM	9	4	13
	1:15 PM	11	4	15
	1:20 PM	10	1	11
	1:25 PM	7	2	9
	1:30 PM	5	2	7
	1:35 PM	3	1	4
	1:40 PM	5	3	8
	1:45 PM	3	3	6
	1:50 PM	2	2	4
	1:55 PM	4	0	4
	2:00 PM	3	1	4
	2:05 PM	2	2	4
	2:10 PM	0	0	0
	2:15 PM	4	1	5
	2:20 PM	4	2	6
	2:25 PM	4	3	7
	2:30 PM	5	3	8
	2:35 PM	6	3	9
	2:40 PM	9	3	12
	2:45 PM	9	3	12
	2:50 PM	12	0	12
	2:55 PM	14	1	15
	3:00 PM	16	1	17

14570 Lee Hwy, Gainesville, VA 20155

11.255 ksf

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
12/5/2024	3:00 PM	4	0	4
Thursday	3:05 PM	1	0	1
	3:10 PM	1	0	1
	3:15 PM	0	2	2
	3:20 PM	0	1	1
	3:25 PM	7	3	10
	3:30 PM	4	3	7
	3:35 PM	5	2	7
	3:40 PM	4	3	7
	3:45 PM	5	3	8
	3:50 PM	4	3	7
	3:55 PM	2	2	4
	4:00 PM	1	0	1
	4:05 PM	0	0	0
	4:10 PM	1	0	1
	4:15 PM	0	1	1
	4:20 PM	2	3	5
	4:25 PM	0	3	3
	4:30 PM	0	0	0
	4:35 PM	3	0	3
	4:40 PM	0	0	0
	4:45 PM	0	0	0
	4:50 PM	0	0	0
	4:55 PM	0	1	1
	5:00 PM	1	0	1
	5:05 PM	0	0	0
	5:10 PM	0	0	0
	5:15 PM	0	1	1
	5:20 PM	0	0	0
	5:25 PM	0	0	0
	5:30 PM	0	0	0
	5:35 PM	0	0	0
	5:40 PM	0	0	0
	5:45 PM	0	1	1
	5:50 PM	0	0	0
	5:55 PM	0	0	0
	6:00 PM	0	0	0

14570 Lee Hwy, Gainesville, VA 20155

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
12/7/2024	10:00 AM	0	1	1
Saturday	10:05 AM	1	0	1
	10:10 AM	2	3	5
	10:15 AM	2	2	4
	10:20 AM	3	3	6
	10:25 AM	1	1	2
	10:30 AM	1	0	1
	10:35 AM	2	0	2
	10:40 AM	0	0	0
	10:45 AM	2	1	3
	10:50 AM	1	0	1
	10:55 AM	0	0	0
	11:00 AM	0	2	2
	11:05 AM	1	2	3
	11:10 AM	1	1	2
	11:15 AM	1	1	2
	11:20 AM	0	1	1
	11:25 AM	3	3	6
	11:30 AM	0	0	0
	11:35 AM	3	3	6
	11:40 AM	4	4	8
	11:45 AM	7	3	10
	11:50 AM	9	3	12
	11:55 AM	10	3	13
	12:00 PM	8	4	12
	12:05 PM	7	3	10
	12:10 PM	8	4	12
	12:15 PM	7	3	10
	12:20 PM	4	3	7
	12:25 PM	2	2	4
	12:30 PM	1	2	3
	12:35 PM	1	0	1
	12:40 PM	0	0	0
	12:45 PM	1	2	3
	12:50 PM	3	2	5
	12:55 PM	0	0	0
	1:00 PM	0	3	3
	1:05 PM	2	2	4
	1:10 PM	1	0	1
	1:15 PM	1	0	1
	1:20 PM	2	0	2
	1:25 PM	0	2	2
	1:30 PM	1	1	2
	1:35 PM	2	0	2
	1:40 PM	1	1	2
	1:45 PM	1	2	3
	1:50 PM	2	0	2
	1:55 PM	2	1	3
	2:00 PM	4	3	7
	2:05 PM	0	2	2
	2:10 PM	2	0	2
	2:15 PM	2	2	4
	2:20 PM	2	0	2
	2:25 PM	1	1	2
	2:30 PM	0	0	0
	2:35 PM	1	0	1
	2:40 PM	0	0	0
	2:45 PM	4	1	5
	2:50 PM	4	2	6
	2:55 PM	0	2	2
	3:00 PM	0	0	0

632 Grant Street, Herndon, VA 20170

10.992 ksf

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
12/5/2024	3:00 PM	1	0	1
Thursday	3:05 PM	0	0	0
	3:10 PM	0	0	0
	3:15 PM	0	0	0
	3:20 PM	2	1	3
	3:25 PM	0	0	0
	3:30 PM	0	0	0
	3:35 PM	0	1	1
	3:40 PM	0	0	0
	3:45 PM	0	0	0
	3:50 PM	4	0	4
	3:55 PM	2	2	4
	4:00 PM	1	2	3
	4:05 PM	0	0	0
	4:10 PM	1	0	1
	4:15 PM	0	0	0
	4:20 PM	0	0	0
	4:25 PM	0	0	0
	4:30 PM	1	1	2
	4:35 PM	1	1	2
	4:40 PM	0	0	0
	4:45 PM	0	0	0
	4:50 PM	0	0	0
	4:55 PM	0	0	0
	5:00 PM	0	1	1
	5:05 PM	0	0	0
	5:10 PM	2	0	2
	5:15 PM	3	0	3
	5:20 PM	1	0	1
	5:25 PM	0	0	0
	5:30 PM	0	0	0
	5:35 PM	0	0	0
	5:40 PM	0	0	0
	5:45 PM	0	0	0
	5:50 PM	0	0	0
	5:55 PM	0	0	0
	6:00 PM	0	0	0

632 Grant Street, Herndon, VA 20170

Day	Time	Queue - at pay station	Queue - pay to tunnel	Total
12/7/2024	10:00 AM	4	2	6
Saturday	10:05 AM	5	5	10
	10:10 AM	5	4	9
	10:15 AM	4	4	8
	10:20 AM	2	4	6
	10:25 AM	2	1	3
	10:30 AM	2	0	2
	10:35 AM	1	1	2
	10:40 AM	1	1	2
	10:45 AM	4	0	4
	10:50 AM	1	0	1
	10:55 AM	0	0	0
	11:00 AM	2	1	3
	11:05 AM	3	0	3
	11:10 AM	3	0	3
	11:15 AM	0	1	1
	11:20 AM	1	0	1
	11:25 AM	4	0	4
	11:30 AM	4	2	6
	11:35 AM	0	2	2
	11:40 AM	1	3	4
	11:45 AM	2	4	6
	11:50 AM	2	5	7
	11:55 AM	1	1	2
	12:00 PM	3	1	4
	12:05 PM	3	1	4
	12:10 PM	5	0	5
	12:15 PM	1	2	3
	12:20 PM	3	0	3
	12:25 PM	2	2	4
	12:30 PM	3	0	3
	12:35 PM	8	0	8
	12:40 PM	2	2	4
	12:45 PM	0	5	5
	12:50 PM	3	1	4
	12:55 PM	2	2	4
	1:00 PM	4	3	7
	1:05 PM	0	0	0
	1:10 PM	1	0	1
	1:15 PM	0	1	1
	1:20 PM	2	0	2
	1:25 PM	1	2	3
	1:30 PM	2	0	2
	1:35 PM	0	2	2
	1:40 PM	2	0	2
	1:45 PM	3	3	6
	1:50 PM	1	0	1
	1:55 PM	0	0	0
	2:00 PM	1	0	1
	2:05 PM	2	1	3
	2:10 PM	0	2	2
	2:15 PM	0	1	1
	2:20 PM	0	1	1
	2:25 PM	0	1	1
	2:30 PM	0	0	0
	2:35 PM	0	0	0
	2:40 PM	3	0	3
	2:45 PM	0	3	3
	2:50 PM	1	2	3
	2:55 PM	2	0	2
	3:00 PM	1	4	5

# APPENDIX F: Volume Development Worksheets



TPD# BLC.149  
 12/18/2024  
 Traffic Volumes Worksheet  
 Intersection:  
 Synchro Node:

Kimberton Road and Nutt Road/Schuylkill Road											
1	Adjacent intersections:	West	0	East	0	North	0	South	0		

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
<b>2024 Existing Counts</b>	41	535	70	297	634	116	223	188	339	195	133	43	2814
Balancing													
<b>2024 Existing Volumes</b>	41	535	70	297	634	116	223	188	339	195	133	43	2814
Base growth (0.44% compounded for 2 yr)	0	5	1	3	6	1	2	2	3	2	1	0	26
Odessa		7	1		11		1						
Trieste		18	2		18		2						
Paradise Village		18		1	8				2				
Steelworks		29		2	16				3				
348-370 Bridge Street		3		1	2				1				
Aldi - Kimberton Square		26	8		32		9						
Hares Hill Road Elementary School		58	6		39		4						
<b>2026 Base Volumes</b>	41	699	88	304	766	117	241	190	348	197	134	43	3168
													0

ENTER = 21 (20)  
 EXIT = 21 (21)

Trip Assignment % - New Enter				45.0%									
Trip Assignment % - New Exit		40.0%					30.0%		5.0%				
Trip Assignment % - Pass-by Enter				30.0%	-30.0%								
Trip Assignment % - Pass-by Exit							30.0%						
<b>New Trips</b>		8		9			6		1				24
<b>Pass-by Trips</b>				6	-6		6						6
<b>2026 Projected Volumes</b>	41	707	88	319	760	117	253	190	349	197	134	43	3198

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
<b>2024 Existing Counts</b>	43	537	70	252	533	130	98	149	240	232	151	52	2487
Balancing													
<b>2024 Existing Volumes</b>	43	537	70	252	533	130	98	149	240	232	151	52	2487
Base growth (0.44% compounded for 2 yr)	0	5	1	2	5	1	1	1	2	2	1	0	21
Odessa		7	1		11		1						
Trieste		18	2		18		2						
Paradise Village		18	2		8		1						
Steelworks		40		4	32				5				
348-370 Bridge Street		3		1	3				1				
Aldi - Kimberton Square		43	12		40		12						
Hares Hill Road Elementary School													
<b>2026 Base Volumes</b>	43	671	88	259	650	131	115	150	248	234	152	52	2793

ENTER = 38 (38)  
 EXIT = 38 (38)

Trip Assignment % - New Enter				45.0%									
Trip Assignment % - New Exit		40.0%					30.0%		5.0%				
Trip Assignment % - Pass-by Enter				32.0%	-32.0%								
Trip Assignment % - Pass-by Exit							32.0%						
<b>New Trips</b>		15		17			11		2				45
<b>Pass-by Trips</b>				12	-12		12						12
<b>2026 Projected Volumes</b>	43	686	88	288	638	131	138	150	250	234	152	52	2850

TPD# BLC.149  
 12/18/2024  
 Traffic Volumes Worksheet  
 Intersection:  
 Synchro Node:

Schuylkill Road & RIRO Driveway									
2	Adjacent intersections:	West	0	East	0	North	0	South	0

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
<b>2024 Existing Counts</b>													0
Balancing		646			900								
<b>2024 Existing Volumes</b>	0	646	0	0	900	0	0	0	0	0	0	0	1546
Base growth (0.44% compounded for 2 yr)	0	6	0	0	8	0	0	0	0	0	0	0	14
Odessa		8			12								
Trieste		20			20								
Paradise Village		18			8								
Steelworks		29			16								
348-370 Bridge Street		3			2								
Aldi - Kimberton Square		34			41								
Hares Hill Road Elementary School		64			43								
<b>2026 Base Volumes</b>	0	828	0	0	1050	0	0	0	0	0	0	0	1878
													0

ENTER = 21 (20)  
 EXIT = 21 (21)

Trip Assignment % - New Enter			30.0%										
Trip Assignment % - New Exit					30.0%					40.0%			
Trip Assignment % - Pass-by Enter		-28.0%	28.0%										
Trip Assignment % - Pass-by Exit									28.0%				
<b>New Trips</b>			7		6				8				21
<b>Pass-by Trips</b>		-6	6						6				6
<b>2026 Projected Volumes</b>	0	822	13	0	1056	0	0	0	14	0	0	0	1905

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
<b>2024 Existing Counts</b>													0
Balancing		650			683								
<b>2024 Existing Volumes</b>	0	650	0	0	683	0	0	0	0	0	0	0	1333
Base growth (0.44% compounded for 2 yr)	0	6	0	0	6	0	0	0	0	0	0	0	12
Odessa		8			12								
Trieste		20			20								
Paradise Village		20			9								
Steelworks		40			32								
348-370 Bridge Street		3			3								
Aldi - Kimberton Square		55			52								
Hares Hill Road Elementary School		0			0								
<b>2026 Base Volumes</b>	0	802	0	0	817	0	0	0	0	0	0	0	1619

ENTER = 38 (38)  
 EXIT = 38 (38)

Trip Assignment % - New Enter			30.0%										
Trip Assignment % - New Exit					30.0%				40.0%				
Trip Assignment % - Pass-by Enter		-23.0%	23.0%										
Trip Assignment % - Pass-by Exit									23.0%				
<b>New Trips</b>			11		11				15				37
<b>Pass-by Trips</b>		-9	9						9				9
<b>2026 Projected Volumes</b>	0	793	20	0	828	0	0	0	24	0	0	0	1665

TPD# BLC.149  
 12/18/2024  
 Traffic Volumes Worksheet  
 Intersection:  
 Synchro Node:

<b>Kimberton Road &amp; Full Access Driveway</b>									
2	Adjacent intersections:	West	0	East	0	North	0	South	0

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
<b>2024 Existing Counts</b>													0
Balancing								750			500		
<b>2024 Existing Volumes</b>	0	0	0	0	0	0	0	750	0	0	500	0	1250
Base growth (0.44% compounded for 2 yr)	0	0	0	0	0	0	0	7	0	0	4	0	11
Odessa								1			1		
Trieste								2			2		
Paradise Village								2			1		
Steelworks								3			2		
348-370 Bridge Street								1			1		
Aldi - Kimberton Square								9			8		
Hares Hill Road Elementary School								4			6		
<b>2026 Base Volumes</b>	0	0	0	0	0	0	0	779	0	0	525	0	1304
													0

ENTER = 21 (20)  
 EXIT = 21 (21)

Trip Assignment % - New Enter							25.0%					45.0%	
Trip Assignment % - New Exit	35.0%		25.0%										
Trip Assignment % - Pass-by Enter							21.0%	-21.0%			-21.0%	51.0%	
Trip Assignment % - Pass-by Exit	51.0%		21.0%										
<b>New Trips</b>	7		6				5				9	27	
<b>Pass-by Trips</b>	10		5				4	-4			-4	10	21
<b>2026 Projected Volumes</b>	17	0	11	0	0	0	9	775	0	0	521	19	1352

Time Period: SAT Midday Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
<b>2024 Existing Counts</b>													0
Balancing								487			473		
<b>2024 Existing Volumes</b>	0	0	0	0	0	0	0	487	0	0	473	0	960
Base growth (0.44% compounded for 2 yr)	0	0	0	0	0	0	0	4	0	0	4	0	8
Odessa								1			1		
Trieste								2			2		
Paradise Village								1			2		
Steelworks								5			4		
348-370 Bridge Street								1			1		
Aldi - Kimberton Square								12			12		
Hares Hill Road Elementary School								0			0		
<b>2026 Base Volumes</b>	0	0	0	0	0	0	0	513	0	0	499	0	1012

ENTER = 38 (38)  
 EXIT = 38 (38)

Trip Assignment % - New Enter							25.0%					45.0%	
Trip Assignment % - New Exit	35.0%		25.0%										
Trip Assignment % - Pass-by Enter							27.0%	-27.0%			-18.0%	50.0%	
Trip Assignment % - Pass-by Exit	59.0%		18.0%										
<b>New Trips</b>	13		10				10				17	50	
<b>Pass-by Trips</b>	22		7				10	-10			-7	19	41
<b>2026 Projected Volumes</b>	35	0	17	0	0	0	20	503	0	0	492	36	1103

# APPENDIX G: Capacity Analyses



# Existing Conditions

Existing Conditions

Timing Plan: P.M. Peak Hour

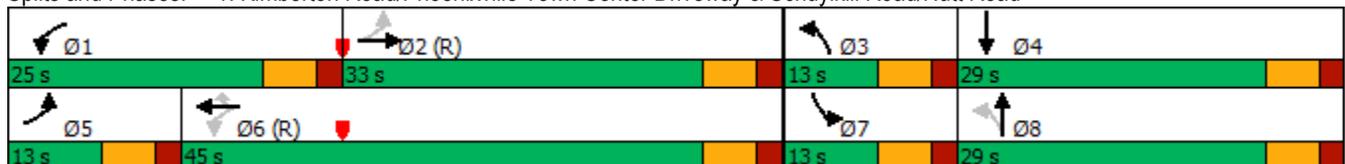
1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	535	70	297	634	116	223	188	339	195	133	43
Future Volume (vph)	41	535	70	297	634	116	223	188	339	195	133	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	14	10	11	14	10	12	13	11	14	14
Grade (%)		1%			0%			-2%				3%
Storage Length (ft)	185		0	110		175	200		325	75		65
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	75			25			25			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35				25
Link Distance (ft)		500			555			636				296
Travel Time (s)		9.7			10.8			12.4				8.1
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	3%	1%	1%	0%	1%	0%	2%	1%	0%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Free	Prot		NA
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases	2			6		6	8		Free			
Detector Phase	5	2		1	6	6	3	8		7		4
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0	15.0	3.0	5.0		3.0		5.0
Minimum Split (s)	11.0	26.0		11.0	26.0	26.0	11.0	29.0		11.0		29.0
Total Split (s)	13.0	33.0		25.0	45.0	45.0	13.0	29.0		13.0		29.0
Total Split (%)	13.0%	33.0%		25.0%	45.0%	45.0%	13.0%	29.0%		13.0%		29.0%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None		None

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 75 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



Existing Conditions

Timing Plan: P.M. Peak Hour

1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	535	70	297	634	116	223	188	339	195	133	43
Future Volume (veh/h)	41	535	70	297	634	116	223	188	339	195	133	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1822	1786	1786	1872	1860	1875	1920	1736	1820	1791
Adj Flow Rate, veh/h	42	552	65	306	654	71	230	194	0	201	137	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	3	1	1	0	1	0	2	1	0	2
Cap, veh/h	326	1364	160	542	965	855	278	269		257	198	53
Arrive On Green	0.04	0.45	0.44	0.13	0.54	0.54	0.08	0.14	0.00	0.08	0.14	0.13
Sat Flow, veh/h	1709	3048	358	1701	1786	1584	1772	1875	1627	3207	1377	372
Grp Volume(v), veh/h	42	306	311	306	654	71	230	194	0	201	0	174
Grp Sat Flow(s),veh/h/ln	1709	1691	1715	1701	1786	1584	1772	1875	1627	1603	0	1749
Q Serve(g_s), s	1.3	12.2	12.3	8.7	26.6	2.2	8.0	9.9	0.0	6.2	0.0	9.5
Cycle Q Clear(g_c), s	1.3	12.2	12.3	8.7	26.6	2.2	8.0	9.9	0.0	6.2	0.0	9.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	326	757	767	542	965	855	278	269		257	0	251
V/C Ratio(X)	0.13	0.40	0.41	0.56	0.68	0.08	0.83	0.72		0.78	0.00	0.69
Avail Cap(c_a), veh/h	401	757	767	663	965	855	278	450		257	0	420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.3	18.6	18.7	11.5	16.7	11.1	37.9	40.9	0.0	45.1	0.0	40.8
Incr Delay (d2), s/veh	0.2	1.6	1.6	0.9	3.8	0.2	18.1	3.6	0.0	14.6	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	8.5	8.7	5.6	16.4	1.4	5.6	8.3	0.0	5.4	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	20.2	20.3	12.4	20.5	11.3	56.0	44.5	0.0	59.7	0.0	44.2
LnGrp LOS	B	C	C	B	C	B	E	D		E	A	D
Approach Vol, veh/h		659			1031			424				375
Approach Delay, s/veh		20.0			17.5			50.8				52.5
Approach LOS		B			B			D				D
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	49.7	13.0	19.4	8.6	59.0	13.0	19.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	27.0	7.0	23.0	7.0	39.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	11.2	14.7	10.5	11.5	3.8	29.1	8.7	12.4				
Green Ext Time (p_c), s	0.7	1.8	0.0	0.4	0.0	2.2	0.0	0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			29.1									
HCM 6th LOS			C									
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

Existing Conditions

Timing Plan: Saturday Peak Hour

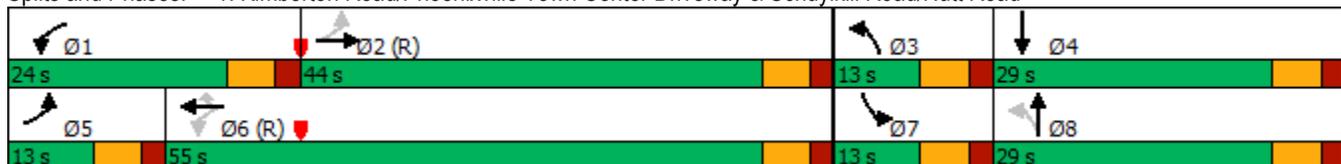
1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	537	70	252	533	130	98	149	240	232	151	52
Future Volume (vph)	43	537	70	252	533	130	98	149	240	232	151	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	14	10	11	14	10	12	13	11	14	14
Grade (%)		1%			0%			-2%				3%
Storage Length (ft)	185		0	110		175	200		325	75		65
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	75			25			25			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35				25
Link Distance (ft)		500			555			636				296
Travel Time (s)		9.7			10.8			12.4				8.1
Confl. Peds. (#/hr)	2		3	3		2	1		5	5		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	1%	1%	0%	1%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Free	Prot		NA
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases	2			6		6	8		Free			
Detector Phase	5	2		1	6	6	3	8		7		4
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0	15.0	3.0	5.0		3.0		5.0
Minimum Split (s)	11.0	26.0		11.0	26.0	26.0	11.0	29.0		11.0		29.0
Total Split (s)	13.0	44.0		24.0	55.0	55.0	13.0	29.0		13.0		29.0
Total Split (%)	11.8%	40.0%		21.8%	50.0%	50.0%	11.8%	26.4%		11.8%		26.4%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None		None

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 74 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

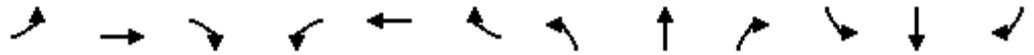
Splits and Phases: 1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



Existing Conditions

Timing Plan: Saturday Peak Hour

1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗	↖	↗	↗	↖
Traffic Volume (veh/h)	43	537	70	252	533	130	98	149	240	232	151	52
Future Volume (veh/h)	43	537	70	252	533	130	98	149	240	232	151	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1866	1772	1786	1872	1875	1860	1935	1750	1805	1791
Adj Flow Rate, veh/h	45	565	60	265	561	93	103	157	0	244	159	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	2	1	0	0	1	1	0	1	2
Cap, veh/h	387	1480	157	525	987	875	249	291		235	208	63
Arrive On Green	0.04	0.48	0.47	0.11	0.55	0.55	0.07	0.16	0.00	0.07	0.16	0.15
Sat Flow, veh/h	1709	3085	327	1688	1786	1582	1785	1860	1640	3233	1325	400
Grp Volume(v), veh/h	45	309	316	265	561	93	103	157	0	244	0	207
Grp Sat Flow(s),veh/h/ln	1709	1691	1720	1688	1786	1582	1785	1860	1640	1616	0	1725
Q Serve(g_s), s	1.4	12.8	12.9	8.0	22.5	3.1	5.2	8.6	0.0	8.0	0.0	12.7
Cycle Q Clear(g_c), s	1.4	12.8	12.9	8.0	22.5	3.1	5.2	8.6	0.0	8.0	0.0	12.7
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	387	812	825	525	987	875	249	291		235	0	270
V/C Ratio(X)	0.12	0.38	0.38	0.50	0.57	0.11	0.41	0.54		1.04	0.00	0.77
Avail Cap(c_a), veh/h	450	812	825	632	987	875	249	406		235	0	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	18.2	18.3	11.5	16.0	11.7	35.4	42.7	0.0	51.0	0.0	44.6
Incr Delay (d2), s/veh	0.1	1.4	1.3	0.8	2.4	0.2	1.1	1.5	0.0	68.9	0.0	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	8.9	9.1	5.1	14.3	2.0	4.1	7.2	0.0	9.5	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	19.6	19.6	12.2	18.4	11.9	36.5	44.3	0.0	119.9	0.0	50.6
LnGrp LOS	B	B	B	B	B	B	D	D		F	A	D
Approach Vol, veh/h		670			919			260				451
Approach Delay, s/veh		19.3			16.0			41.2				88.1
Approach LOS		B			B			D				F
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	57.8	13.0	22.2	9.0	65.8	13.0	22.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	18.0	38.0	7.0	23.0	7.0	49.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	10.5	15.3	7.7	14.7	3.9	25.0	10.5	11.1				
Green Ext Time (p_c), s	0.5	2.2	0.0	0.4	0.0	2.5	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

# 2026 Base (No-Build) Conditions

2026 Base (No-Build) Conditions

Timing Plan: P.M. Peak Hour

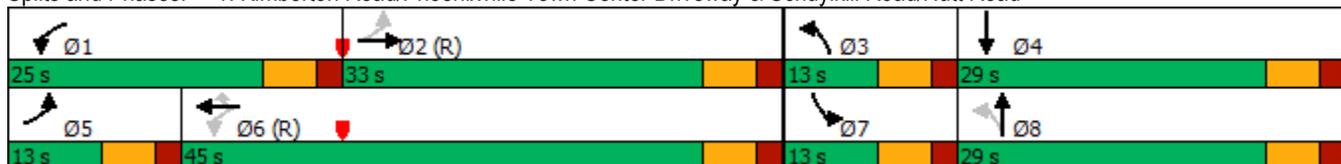
1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	699	88	304	766	117	241	190	348	197	134	43
Future Volume (vph)	41	699	88	304	766	117	241	190	348	197	134	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	14	10	11	14	10	12	13	11	14	14
Grade (%)		1%			0%			-2%				3%
Storage Length (ft)	185		0	110		175	200		325	75		65
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	75			25			25			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35				25
Link Distance (ft)		500			555			636				296
Travel Time (s)		9.7			10.8			12.4				8.1
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	3%	1%	1%	0%	1%	0%	2%	1%	0%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Free	Prot		NA
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases	2			6		6	8		Free			
Detector Phase	5	2		1	6	6	3	8		7		4
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0	15.0	3.0	5.0		3.0		5.0
Minimum Split (s)	11.0	26.0		11.0	26.0	26.0	11.0	29.0		11.0		29.0
Total Split (s)	13.0	33.0		25.0	45.0	45.0	13.0	29.0		13.0		29.0
Total Split (%)	13.0%	33.0%		25.0%	45.0%	45.0%	13.0%	29.0%		13.0%		29.0%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None		None

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 75 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



2026 Base (No-Build) Conditions

Timing Plan: P.M. Peak Hour

1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	699	88	304	766	117	241	190	348	197	134	43
Future Volume (veh/h)	41	699	88	304	766	117	241	190	348	197	134	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1822	1786	1786	1872	1860	1875	1920	1736	1820	1791
Adj Flow Rate, veh/h	42	721	84	313	790	72	248	196	0	203	138	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	3	1	1	0	1	0	2	1	0	2
Cap, veh/h	241	1354	158	472	963	854	279	271		257	200	54
Arrive On Green	0.04	0.44	0.43	0.13	0.54	0.54	0.08	0.14	0.00	0.08	0.14	0.13
Sat Flow, veh/h	1709	3052	355	1701	1786	1583	1772	1875	1627	3207	1380	370
Grp Volume(v), veh/h	42	399	406	313	790	72	248	196	0	203	0	175
Grp Sat Flow(s),veh/h/ln	1709	1691	1715	1701	1786	1583	1772	1875	1627	1603	0	1750
Q Serve(g_s), s	1.3	17.2	17.3	9.0	36.6	2.2	8.0	10.0	0.0	6.2	0.0	9.5
Cycle Q Clear(g_c), s	1.3	17.2	17.3	9.0	36.6	2.2	8.0	10.0	0.0	6.2	0.0	9.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	241	750	761	472	963	854	279	271		257	0	253
V/C Ratio(X)	0.17	0.53	0.53	0.66	0.82	0.08	0.89	0.72		0.79	0.00	0.69
Avail Cap(c_a), veh/h	315	750	761	588	963	854	279	450		257	0	420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	20.3	20.4	13.5	19.1	11.1	38.7	40.9	0.0	45.2	0.0	40.8
Incr Delay (d2), s/veh	0.3	2.7	2.7	2.0	7.8	0.2	27.5	3.6	0.0	15.4	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	11.4	11.5	6.0	22.3	1.4	7.7	8.4	0.0	5.4	0.0	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	23.0	23.0	15.5	26.8	11.3	66.2	44.5	0.0	60.6	0.0	44.1
LnGrp LOS	B	C	C	B	C	B	E	D		E	A	D
Approach Vol, veh/h		847			1175			444			378	
Approach Delay, s/veh		22.7			22.9			56.6			52.9	
Approach LOS		C			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.2	49.4	13.0	19.5	8.6	58.9	13.0	19.5				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	27.0	7.0	23.0	7.0	39.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	11.5	19.7	10.5	11.5	3.8	39.1	8.7	12.5				
Green Ext Time (p_c), s	0.7	1.9	0.0	0.4	0.0	0.0	0.0	0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			32.1									
HCM 6th LOS			C									
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

2026 Base (No-Build) Conditions

Timing Plan: Saturday Peak Hour

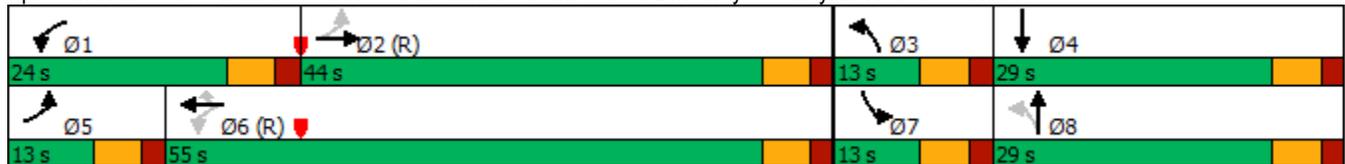
1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	671	88	259	650	131	115	150	248	234	152	52
Future Volume (vph)	43	671	88	259	650	131	115	150	248	234	152	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	14	10	11	14	10	12	13	11	14	14
Grade (%)		1%			0%			-2%				3%
Storage Length (ft)	185		0	110		175	200		325	75		65
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	75			25			25			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35				25
Link Distance (ft)		500			555			636				296
Travel Time (s)		9.7			10.8			12.4				8.1
Confl. Peds. (#/hr)	2		3	3		2	1		5	5		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	1%	1%	0%	1%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Free	Prot		NA
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases	2			6		6	8		Free			
Detector Phase	5	2		1	6	6	3	8		7		4
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0	15.0	3.0	5.0		3.0		5.0
Minimum Split (s)	11.0	26.0		11.0	26.0	26.0	11.0	29.0		11.0		29.0
Total Split (s)	13.0	44.0		24.0	55.0	55.0	13.0	29.0		13.0		29.0
Total Split (%)	11.8%	40.0%		21.8%	50.0%	50.0%	11.8%	26.4%		11.8%		26.4%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None		None

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 74 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



2026 Base (No-Build) Conditions

Timing Plan: Saturday Peak Hour

1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	671	88	259	650	131	115	150	248	234	152	52
Future Volume (veh/h)	43	671	88	259	650	131	115	150	248	234	152	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1866	1772	1786	1872	1875	1860	1935	1750	1805	1791
Adj Flow Rate, veh/h	45	706	79	273	684	94	121	158	0	246	160	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	2	1	0	0	1	1	0	1	2
Cap, veh/h	310	1461	163	463	986	874	249	292		235	209	63
Arrive On Green	0.04	0.48	0.47	0.11	0.55	0.55	0.07	0.16	0.00	0.07	0.16	0.15
Sat Flow, veh/h	1709	3066	343	1688	1786	1582	1785	1860	1640	3233	1327	398
Grp Volume(v), veh/h	45	389	396	273	684	94	121	158	0	246	0	208
Grp Sat Flow(s),veh/h/ln	1709	1691	1717	1688	1786	1582	1785	1860	1640	1616	0	1725
Q Serve(g_s), s	1.4	17.2	17.3	8.3	30.6	3.1	6.2	8.6	0.0	8.0	0.0	12.7
Cycle Q Clear(g_c), s	1.4	17.2	17.3	8.3	30.6	3.1	6.2	8.6	0.0	8.0	0.0	12.7
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	310	806	818	463	986	874	249	292		235	0	271
V/C Ratio(X)	0.15	0.48	0.48	0.59	0.69	0.11	0.49	0.54		1.05	0.00	0.77
Avail Cap(c_a), veh/h	372	806	818	566	986	874	249	406		235	0	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.8	19.6	19.7	13.0	17.9	11.7	35.8	42.7	0.0	51.0	0.0	44.5
Incr Delay (d2), s/veh	0.2	2.1	2.0	1.2	4.0	0.2	1.5	1.6	0.0	71.3	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	11.3	11.5	5.4	18.7	2.0	4.9	7.3	0.0	9.6	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	21.6	21.7	14.2	21.9	12.0	37.2	44.3	0.0	122.3	0.0	50.7
LnGrp LOS	B	C	C	B	C	B	D	D		F	A	D
Approach Vol, veh/h		830			1051			279				454
Approach Delay, s/veh		21.4			19.0			41.2				89.5
Approach LOS		C			B			D				F
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.3	57.4	13.0	22.3	9.0	65.8	13.0	22.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	18.0	38.0	7.0	23.0	7.0	49.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	10.8	19.7	8.7	14.7	3.9	33.1	10.5	11.1				
Green Ext Time (p_c), s	0.5	2.7	0.0	0.4	0.0	2.9	0.0	0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			34.4									
HCM 6th LOS			C									
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

# 2026 Projected (Build) Conditions

Projected Conditions

Timing Plan: Saturday Peak Hour

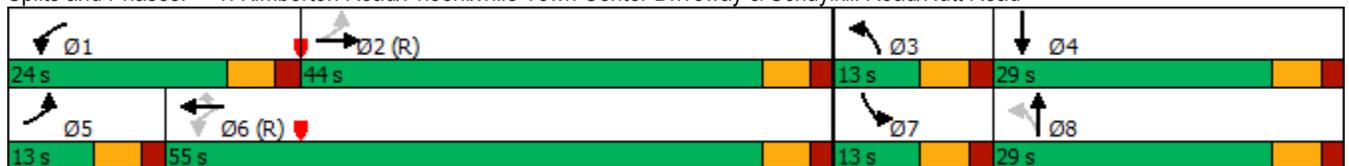
1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	686	88	288	638	131	138	150	250	234	152	52
Future Volume (vph)	43	686	88	288	638	131	138	150	250	234	152	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	14	10	11	14	10	12	13	11	14	14
Grade (%)		1%			0%			-2%				3%
Storage Length (ft)	185		0	110		175	200		325	75		65
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	75			25			25			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35				25
Link Distance (ft)		290			555			311				296
Travel Time (s)		5.6			10.8			6.1				8.1
Confl. Peds. (#/hr)	2		3	3		2	1		5	5		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	1%	1%	0%	1%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Free	Prot		NA
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases	2			6		6	8		Free			
Detector Phase	5	2		1	6	6	3	8		7		4
Switch Phase												
Minimum Initial (s)	3.0	15.0		3.0	15.0	15.0	3.0	5.0		3.0		5.0
Minimum Split (s)	11.0	26.0		11.0	26.0	26.0	11.0	29.0		11.0		29.0
Total Split (s)	13.0	44.0		24.0	55.0	55.0	13.0	29.0		13.0		29.0
Total Split (%)	11.8%	40.0%		21.8%	50.0%	50.0%	11.8%	26.4%		11.8%		26.4%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0		-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None		None

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 74 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

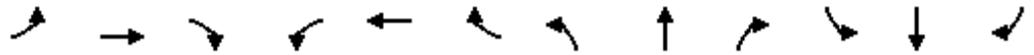
Splits and Phases: 1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



Projected Conditions

Timing Plan: Saturday Peak Hour

1: Kimberton Road/Phoenixville Town Center Driveway & Schuylkill Road/Nutt Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	686	88	288	638	131	138	150	250	234	152	52
Future Volume (veh/h)	43	686	88	288	638	131	138	150	250	234	152	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1780	1866	1772	1786	1872	1875	1860	1935	1750	1805	1791
Adj Flow Rate, veh/h	45	722	79	303	672	94	145	158	0	246	160	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	2	1	0	0	1	1	0	1	2
Cap, veh/h	317	1433	157	466	986	874	249	292		235	209	63
Arrive On Green	0.04	0.47	0.46	0.12	0.55	0.55	0.07	0.16	0.00	0.07	0.16	0.15
Sat Flow, veh/h	1709	3074	336	1688	1786	1582	1785	1860	1640	3233	1327	398
Grp Volume(v), veh/h	45	397	404	303	672	94	145	158	0	246	0	208
Grp Sat Flow(s),veh/h/ln	1709	1691	1719	1688	1786	1582	1785	1860	1640	1616	0	1725
Q Serve(g_s), s	1.5	18.0	18.1	9.4	29.7	3.1	7.5	8.6	0.0	8.0	0.0	12.7
Cycle Q Clear(g_c), s	1.5	18.0	18.1	9.4	29.7	3.1	7.5	8.6	0.0	8.0	0.0	12.7
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	317	789	801	466	986	874	249	292		235	0	271
V/C Ratio(X)	0.14	0.50	0.50	0.65	0.68	0.11	0.58	0.54		1.05	0.00	0.77
Avail Cap(c_a), veh/h	380	789	801	552	986	874	249	406		235	0	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.0	20.5	20.6	13.8	17.7	11.7	36.3	42.7	0.0	51.0	0.0	44.5
Incr Delay (d2), s/veh	0.2	2.3	2.3	2.1	3.8	0.2	3.4	1.6	0.0	71.3	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	11.8	12.0	6.3	18.2	2.0	6.2	7.3	0.0	9.6	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	22.8	22.8	15.8	21.5	12.0	39.7	44.3	0.0	122.3	0.0	50.7
LnGrp LOS	B	C	C	B	C	B	D	D		F	A	D
Approach Vol, veh/h		846			1069			303				454
Approach Delay, s/veh		22.4			19.1			42.1				89.5
Approach LOS		C			B			D				F
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.4	56.3	13.0	22.3	9.0	65.7	13.0	22.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	18.0	38.0	7.0	23.0	7.0	49.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	11.9	20.5	10.0	14.7	4.0	32.2	10.5	11.1				
Green Ext Time (p_c), s	0.6	2.8	0.0	0.4	0.0	2.9	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	34.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Projected Conditions  
2: RIRO Driveway & Schuylkill Road

Timing Plan: Saturday Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑		↗
Traffic Volume (vph)	793	20	0	828	0	24
Future Volume (vph)	793	20	0	828	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	35			35	25	
Link Distance (ft)	246			290	163	
Travel Time (s)	4.8			5.6	4.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	1%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Projected Conditions  
2: RIRO Driveway & Schuylkill Road

Timing Plan: Saturday Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑		↑
Traffic Vol, veh/h	793	20	0	828	0	24
Future Vol, veh/h	793	20	0	828	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	2	2	1	2	2
Mvmt Flow	862	22	0	900	0	26

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	442
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	2.9
Pot Cap-1 Maneuver	-	-	0	-	0	610
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	610
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	610	-	-	-
HCM Lane V/C Ratio	0.043	-	-	-
HCM Control Delay (s)	11.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Projected Conditions  
3: Kimberton Road & Site Driveway

Timing Plan: Saturday Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	35	17	20	503	492	36
Future Volume (vph)	35	17	20	503	492	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	25			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			35	35	
Link Distance (ft)	88			326	311	
Travel Time (s)	2.4			6.4	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Projected Conditions  
3: Kimberton Road & Site Driveway

Timing Plan: Saturday Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	17	20	503	492	36
Future Vol, veh/h	35	17	20	503	492	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	1	1	2
Mvmt Flow	38	18	22	547	535	39

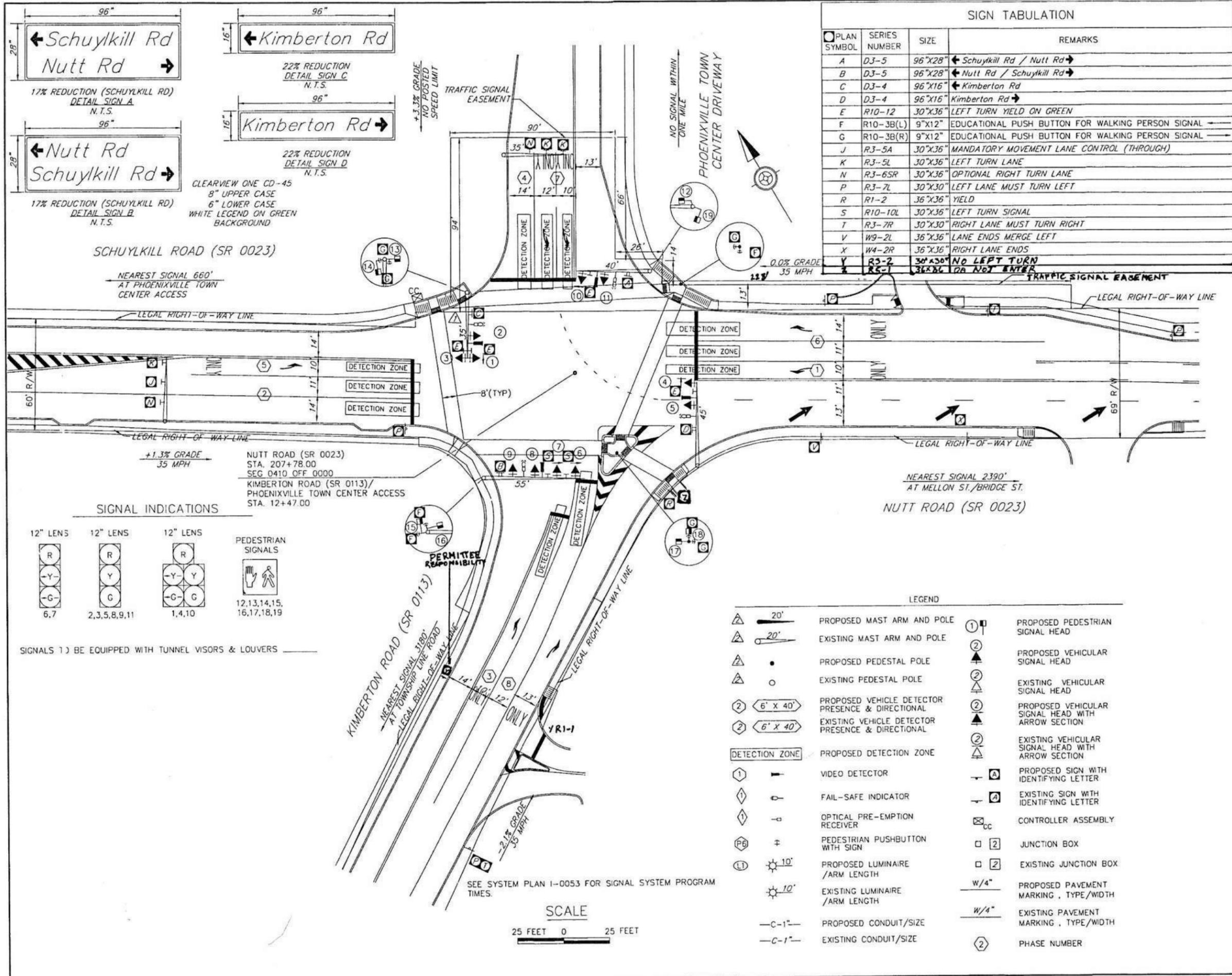
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1146	555	574	0	-	0
Stage 1	555	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.3	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	241	560	761	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	234	560	761	-	-	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.5	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	761	-	435	-	-
HCM Lane V/C Ratio	0.029	-	0.13	-	-
HCM Control Delay (s)	9.9	-	14.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

# APPENDIX H: Traffic Signal Plans





SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	D3-5	96"x28"	Schuylkill Rd / Nutt Rd
B	D3-5	96"x28"	Nutt Rd / Schuylkill Rd
C	D3-4	96"x16"	Kimberton Rd
D	D3-4	96"x16"	Kimberton Rd
E	R10-12	30"x36"	LEFT TURN YIELD ON GREEN
F	R10-3B(L)	9"x12"	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL
G	R10-3B(R)	9"x12"	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL
J	R3-5A	30"x36"	MANDATORY MOVEMENT LANE CONTROL (THROUGH)
K	R3-5L	30"x36"	LEFT TURN LANE
N	R3-6SR	30"x36"	OPTIONAL RIGHT TURN LANE
P	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
R	R1-2	36"x36"	YIELD
S	R10-10L	30"x36"	LEFT TURN SIGNAL
T	R3-7R	30"x30"	RIGHT LANE MUST TURN RIGHT
V	W9-2L	36"x36"	LANE ENDS MERGE LEFT
X	W4-2R	36"x36"	RIGHT LANE ENDS
Y	R3-2	30"x36"	NO LEFT TURN
Z	RS-1	36"x36"	DO NOT ENTER

**GENERAL NOTES**

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 40B.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 40B AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC-7900 SERIES.

SYSTEM PERMIT # I-0053

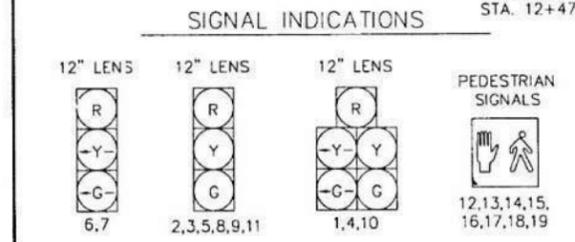
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION  
ENGINEERING DISTRICT 6-0

COUNTY: CHESTER  
MUNICIPALITY: PHOENIXVILLE BOROUGH  
INTERSECTION: NUTT ROAD (S.R. 0023/0113),  
SCHUYLKILL RD (S.R. 0023), & KIMBERTON RD (S.R. 0113)

REVIEWED: \_\_\_\_\_ DATE \_\_\_\_\_  
MUNICIPAL OFFICIAL \_\_\_\_\_ DATE \_\_\_\_\_

RECOMMENDED:  
MARK L. KRAY  
WERNER J. EICHORN  
DISTRICT TRAFFIC ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

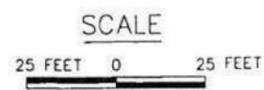
NO.	REVISION	DES/REV	DATE	REVW	DATE	RECOM	DATE
1	ADDED ACCESS ALONG KIMBERTON ROAD	HCA	2/19/17	WJE	3/17/17		3/17/17
2							
3							
4							
5							
6							
7							
8							



SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & LOUVERS

**LEGEND**

	PROPOSED MAST ARM AND POLE		PROPOSED PEDESTRIAN SIGNAL HEAD
	EXISTING MAST ARM AND POLE		PROPOSED VEHICULAR SIGNAL HEAD
	PROPOSED PEDESTAL POLE		EXISTING VEHICULAR SIGNAL HEAD
	EXISTING PEDESTAL POLE		PROPOSED VEHICULAR SIGNAL HEAD WITH ARROW SECTION
	PROPOSED VEHICLE DETECTOR PRESENCE & DIRECTIONAL		EXISTING VEHICULAR SIGNAL HEAD WITH ARROW SECTION
	EXISTING VEHICLE DETECTOR PRESENCE & DIRECTIONAL		PROPOSED SIGN WITH IDENTIFYING LETTER
	PROPOSED DETECTION ZONE		EXISTING SIGN WITH IDENTIFYING LETTER
	VIDEO DETECTOR		CONTROLLER ASSEMBLY
	FAIL-SAFE INDICATOR		JUNCTION BOX
	OPTICAL PRE-EMPTION RECEIVER		EXISTING JUNCTION BOX
	PEDESTRIAN PUSHBUTTON WITH SIGN		PROPOSED PAVEMENT MARKING, TYPE/WIDTH
	PROPOSED LUMINAIRE /ARM LENGTH		EXISTING PAVEMENT MARKING, TYPE/WIDTH
	EXISTING LUMINAIRE /ARM LENGTH		PHASE NUMBER
	PROPOSED CONDUIT/SIZE		
	EXISTING CONDUIT/SIZE		



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ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC-7800 SERIES.

MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8
SIGNALS	1 2 3	4 5 6 7	8 9 10 11	12 13 14 15	16 17 18	19 20 21 22	23 24 25 26	27 28 29 30
1	R/G R0	G/G Y0 R0	R R R R	G G Y R	R R R	R R R R	R R R R	R R R R
2	R R R	G G Y0 R0	R R R R	G G Y R	R R R	R R R R	R R R R	R R R R
3,5	R R R	R R R R	G G Y0 R0	G G Y R	R R R	R R R R	R R R R	R R R R
4	R/G R0	R R R R	G/G Y0 R0	G G Y R	R R R	R R R R	R R R R	R R R R
6,7	R R R	R R R R	R R R R	R R R R	G Y R0	R R R R	G Y R0	R R R R
8,9	R R R	R R R R	R R R R	R R R R	R R R	R R R R	G G Y0 R0	G G Y R
10	R R R	R R R R	R R R R	R R R R	R/G R0	G/G Y0 R0	R R R R	G G Y R
11	R R R	R R R R	R R R R	R R R R	R R R	G G Y0 R0	R R R R	G G Y R
12,13	H H H	M FH H H	H H H H	H H H H	M FH H H	H H H H	H H H H	H H H H
14,15	H H H	H H H H	H H H H	H H H H	M FH H H	H H H H	M FH H H	H H H H
16,17	H H H	H H H H	M FH H H	H H H H	H H H H	H H H H	H H H H	H H H H
18,19	H H H	H H H H	H H H H	H H H H	H H H H	M FH H H	H H H H	M FH H H
FIXED	4 2	4 2	4 2	4 2	4 2	4 2	4 2	4 2
MINIMUM	3	3	3	15	3	3	3	5
PASSAGE	3	3	3	3	3	3	3	3
MAX 1	10	10	20	30	10	10	10	25
PEDESTRIAN		19	19	9 11		15	15	10 13
MEMORY	NL	NL	NL	MoR	NL	NL	NL	NL

OPERATION NOTES:

- ① R/G IF FOLLOWED BY 1+6
- ② R/G IF FOLLOWED BY 2+5
- ③ G/Y IF FOLLOWED BY 2+6
- ④ G IF FOLLOWED BY 2+6
- ⑤ G IF FOLLOWED BY 4+7
- ⑥ R/G IF FOLLOWED BY 3+8
- ⑦ G IF FOLLOWED BY 4+8
- ⑧ G/Y IF FOLLOWED BY 4+8

- ⑨ TIMINGS SHALL BE AS SHOWN IN PHASE 2+6. IT MAY TIME OUT IN THIS PHASE OR MAY BE COMPLETED IN PHASE 2+6.
- ⑩ TIMINGS SHALL BE AS SHOWN IN PHASE 4+8. IT MAY TIME OUT IN THIS PHASE OR MAY BE COMPLETED IN PHASE 4+8.

THIS SIGNAL IS TO BE COORDINATED WITH ADJACENT SIGNALS ALONG NUTT ROAD (SR 0023) FROM RAPP'S DAM ROAD/MOWERE ROAD TO BRIDGE STREET BY MEANS OF FIBER-OPTIC COMMUNICATION.

SEE SYSTEM PLAN I-0053 FOR SIGNAL SYSTEM PROGRAM TIMES. OFFSET REFERENCED TO PHASE 2+6 START OF GREEN (INTERVAL 12).

EMERGENCY PRE-EMPTION NOTES:

- CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE NORTHBOUND & SOUTHBOUND APPROACHES OF NUTT ROAD (SR 0023) AND THE EASTBOUND APPROACH OF KIMBERTON ROAD (SR 0113) AND THE WESTBOUND APPROACH OF PHOENIXVILLE TOWN CENTER DRIVEWAY WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION. THIS EMERGENCY BEACON SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT, AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH. LOCATION OF EMERGENCY VEHICLE DETECTORS ARE TO BE FIELD ADJUSTED TO ACHIEVE MAXIMUM OPERATION.
- THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLES, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY, FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS, ACCORDINGLY. THEN THE GREEN INTERVAL FOR THE PRE-EMPTED PHASE SHALL FOLLOW.
- THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLE SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PRE-EMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.
- IF SIGNALS HAVE BEEN ACTUATED BY PEDESTRIAN PUSH BUTTON AND THE SIGNAL IS PRE-EMPTED, THE PEDESTRIAN TIME SHALL BE SPLIT BETWEEN PED "WALK (MAN)" AND PED "CLEAR (HAND)". THE PED "WALK (MAN)" INTERVAL SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE PED "CLEAR (HAND)" INTERVAL. THIS INTERVAL SHALL TIME OUT, FOLLOWED BY THE APPROPRIATE CLEARANCES, BEFORE GOING INTO EMERGENCY PRE-EMPTION.
- IF THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE ARE FLASHING, ALL SIGNALS SHALL REMAIN FLASHING.
- IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.
- UPON COMPLETION OF PRE-EMPTION PHASE 2+5, 4+7, 1+6, OR 3+8 IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 12 SHALL FOLLOW.
- IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED. PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.

EMERGENCY PRE-EMPTION PHASING

PHASE	2+5	1+6	4+7	3+8
INTERVAL	31 32 33	34 35 36	37 38 39	40 41 42
SIGNAL 1	R R R	G/G Y0 R0	R R R	R R R
2	R R R	G Y0 R0	R R R	R R R
3,5	G Y0 R0	R R R	R R R	R R R
4	G/G Y0 R0	R R R	R R R	R R R
6,7	R R R	R R R	G Y R	R R R
8,9	R R R	R R R	G Y R	R R R
10	R R R	R R R	R R R	G Y R
11	R R R	R R R	R R R	G Y R
12,13,16,17	H H H	H H H	H H H	H H H
14,15,18,19	H H H	H H H	H H H	H H H
FIXED TIME	b 4 2	b 4 2	b 4 2	b 4 2

a SIGNAL TO REMAIN G WHEN RETURNING TO PHASE 2+6  
 b FOR DURATION OF OPTICAL PRE-EMPTION  
 c G/Y IF FOLLOWED BY 2+6  
 NOTE: IF PRE-EMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON, TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PRE-EMPTION.

SYSTEM PERMIT # I-0053

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION  
 ENGINEERING DISTRICT 6-0

COUNTY: CHESTER  
 MUNICIPALITY: PHOENIXVILLE BOROUGH  
 INTERSECTION: NUTT ROAD (S.R. 0023/0113),  
 SCHUYLKILL RD (S.R. 0023), & KIMBERTON RD (S.R. 0113)

REVIEWED: \_\_\_\_\_ DATE \_\_\_\_\_  
 MUNICIPAL OFFICIAL: \_\_\_\_\_ DATE \_\_\_\_\_  
 RECOMMENDED: MARK L. KRAY  
 WERNER J. EICHORN  
 DISTRICT TRAFFIC ENGINEER

NO	REVISION	DES/REV	DATE	REV	DATE	RECOM	DATE
1	ADDED ACCESS ALONG KIMBERTON ROAD	HCA	2/10/17				
2							
3							
4							
5							
6							
7							
8							

SHEET 3 OF 3 PERMIT # 62-0031 FILE # 0031

## GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 212.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, EFFECTIVE DATE DECEMBER 20, 1974.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC-8800 SERIES.

WEEKLY PROGRAM CHART				
EVENT	DAY	TIME	PROGRAM	REMARKS
1	1-5	06:00	1	AM PEAK
2	1-5	10:00	2	MIDDAY
3	1-5	15:00	3	PM PEAK
4	1-7	19:00	2	EVENING/WEEKEND
5	1-7	22:00	FREE	FREE
6	6,7	09:00	2	EVENING/WEEKEND

MONDAY = DAY 1

### SYSTEM NOTES

1. PROGRAMS TO BE SELECTED BY CLOSED LOOP SYSTEM (TIME OF DAY) OR TBC BACKUP.
2. OFFSETS ARE REFERENCED TO THE BEGINNING OF GREEN (PHASE 2+6) ON SCHUYLKILL ROAD/NUTT ROAD (SR 0023). THE MASTER CONTROLLER IS LOCATED AT NUTT ROAD (SR 0023) AND BRIDGE STREET.
3. ACTUAL GREEN TIME DETERMINED BY CYCLE LENGTH.
4. SYSTEM LIMITS :  
SCHUYLKILL ROAD/NUTT ROAD (SR 0023) (5 INTERSECTIONS) – RAPPS DAM ROAD/MOWERE ROAD TO BRIDGE STREET
5. PRIMARY COORDINATION: FIBER OPTIC
6. SECONDARY COORDINATION: TBC (DEFAULT TO BACKUP TBC)

### TIME OF DAY SYSTEM CYCLE/SPLIT/OFFSET

PROGRAM 1		PHASE									CYCLE	OFFSET 1	REFERENCE INTERVAL 1	OFFSET 2	REFERENCE INTERVAL 2	
INTERSECTION		FILE #	1	2	3	4	5	6	7	8	9					
1	SCHUYLKILL RD (SR 0023) AND RAPPS DAM RD/MOWERE RD	2441		82		38		82		38		120	16	1	103	3
2	SCHUYLKILL RD (SR 0023) AND KIMBERTON SQ/VALLEY FORGE MALL DR	1986	13(LEAD)	76(LAG)		31	13(LEAD)	76(LAG)		31		120	54	12	10	14
2a	SCHUYLKILL RD (SR 0023) AND TOWNSHIP LINE ROAD	2614		84		16		84				120	53	1	9	3
3	SCHUYLKILL RD (SR 0023) AND PHOENIXVILLE TOWN CTR DRIVEWAY	3216		81(LAG)		39	21(LEAD)	60(LAG)		39		120	84	5	18	7
4	NUTT RD (SR 0023) AND KIMBERTON RD/SR 0113/PHOENIXVILLE TOWN CTR	0031	29(LEAD)	49(LAG)	13(LEAD)	29(LAG)	13(LEAD)	65(LAG)	13(LEAD)	29(LAG)		120	67	12	110	14
5	NUTT RD (SR 0023) AND BRIDGE ST	0568	18(LEAD)	70(LAG)		32	38(LEAD)	50(LAG)		32		120	0	12	0	14
PROGRAM 2		PHASE									CYCLE	OFFSET 1	REFERENCE INTERVAL 1	OFFSET 2	REFERENCE INTERVAL 2	
INTERSECTION		FILE #	1	2	3	4	5	6	7	8	9					
1	SCHUYLKILL RD (SR 0023) AND RAPPS DAM RD/MOWERE RD	2441		80		30		80		30		110	34	1	26	4
2	SCHUYLKILL RD (SR 0023) AND KIMBERTON SQ/VALLEY FORGE MALL DR	1986	13(LEAD)	66(LAG)		31	15(LEAD)	66(LAG)		31		110	36	12	102	14
2a	SCHUYLKILL RD (SR 0023) AND TOWNSHIP LINE ROAD	2614		81		29		81				110	48	1	19	3
3	SCHUYLKILL RD (SR 0023) AND PHOENIXVILLE TOWN CTR DRIVEWAY	3216		74(LAG)		36	18(LEAD)	56(LAG)		39		110	99	5	39	7
4	NUTT RD (SR 0023) AND KIMBERTON RD/SR 0113/PHOENIXVILLE TOWN CTR	0031	24(LEAD)	44(LAG)	13(LEAD)	29(LAG)	13(LEAD)	55(LAG)	13(LEAD)	29(LAG)		110	74	12	2	14
5	NUTT RD (SR 0023) AND BRIDGE ST	0568	12(LEAD)	75(LAG)		23	28(LEAD)	59(LAG)		23		110	0	12	0	14
PROGRAM 3		PHASE									CYCLE	OFFSET 1	REFERENCE INTERVAL 1	OFFSET 2	REFERENCE INTERVAL 2	
INTERSECTION		FILE #	1	2	3	4	5	6	7	8	9					
1	SCHUYLKILL RD (SR 0023) AND RAPPS DAM RD/MOWERE RD	2441		69		31		69		31		100	2	1	71	3
2	SCHUYLKILL RD (SR 0023) AND KIMBERTON SQ/VALLEY FORGE MALL DR	1986	13(LEAD)	56(LAG)		31	13(LEAD)	56(LAG)		31		100	21	12	77	14
2a	SCHUYLKILL RD (SR 0023) AND TOWNSHIP LINE ROAD	2614		84		16		84				100	94	1	78	3
3	SCHUYLKILL RD (SR 0023) AND PHOENIXVILLE TOWN CTR DRIVEWAY	3216		69(LAG)		31	13(LEAD)	56(LAG)		39		100	80	5	30	7
4	NUTT RD (SR 0023) AND KIMBERTON RD/SR 0113/PHOENIXVILLE TOWN CTR	0031	25(LEAD)	33(LAG)	13(LEAD)	29(LAG)	13(LEAD)	45(LAG)	13(LEAD)	29(LAG)		100	75	12	2	14
5	NUTT RD (SR 0023) AND BRIDGE ST	0568	11(LEAD)	66(LAG)		23	26(LEAD)	51(LAG)		23		100	0	12	0	14

NOTES: - ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.  
- REFER TO THE SIGNAL PERMIT PLAN FOR MAX I, MAX II, CLEARANCE AND PED TIMES.

## SYSTEM PERMIT PLAN

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION  
**ENGINEERING DISTRICT 6-0**

COUNTY: CHESTER

MUNICIPALITY: PHOENIXVILLE BOR, EAST PIKELAND & SCHUYLKILL TWPS

INTERSECTION: SCHUYLKILL RD/NUTT RD (S.R. 0023)

TRAFFIC SIGNAL SYSTEM, SUBSYSTEM #1

REVIEWED: \_\_\_\_\_ DATE \_\_\_\_\_

MUNICIPAL OFFICIAL \_\_\_\_\_ DATE \_\_\_\_\_

RECOMMENDED:  
**PAUL LUTZ** **12/8/10**

**LOUIS BELMONTE** **12/8/10**  
DISTRICT TRAFFIC ENGINEER

NO.	REVISION	DES./REV.	DATE	REV.	DATE	RECOM.	DATE
1	REVISE INT. #1 LANE CONFIG. & TIMINGS	MCM					
2	ADDITION OF #22, 23	MCM					
3							
4							
5							
6							
7							
8							

# **APPENDIX I: Auxiliary Turn Lane Warrant Analyses**



## Turn Lane Warrant and Length Analysis Workbook

### STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Phoenixville Borough"/>	Analysis Date: <input type="text" value="12/18/2024"/>
County: <input type="text" value="Chester County"/>	Conducted By: <input type="text" value="PG"/>
PennDOT Engineering District: <input type="text" value="6"/>	Checked By: <input type="text"/>
	Agency/Company Name: <input type="text" value="TPD"/>
Intersection & Approach Description: <input type="text" value="Schuylkill Road and Site Driveway"/>	
Analysis Period: <input type="text" value="2026 Projected"/>	Number of Approach Lanes: <input type="text" value="2"/>
Design Hour: <input type="text" value="PM Peak Hour"/>	Undivided or Divided Highway: <input type="text" value="Undivided"/>
Intersection Control: <input type="text" value="Unsignalized"/>	
Posted Speed Limit (MPH): <input type="text" value="35"/>	Type of Analysis: <input type="text" value="Right Turn Lane"/>
Type of Terrain: <input type="text" value="Level"/>	Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

### VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes			N/A
	Through	-			N/A
	Right	No			N/A
Opposing	Left	No			N/A
	Through	-			N/A
	Right	Yes			N/A

Advancing Volume: <input type="text" value="N/A"/>
Opposing Volume: <input type="text" value="N/A"/>
Left Turn Volume: <input type="text" value="N/A"/>
% Left Turns in Advancing Volume: <input type="text" value="N/A"/>

Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	823	1.0%	828
	Right	-	13	2.0%	14

Advancing Volume: <input type="text" value="842"/>
Right Turn Volume: <input type="text" value="14"/>

### TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 11"/>
Warrant Met?: <input type="text" value="N/A"/>	Warrant Met?: <input type="text" value="No"/>

### TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/>	
Design Hour Volume of Turning Lane: <input type="text" value="14"/>	
Cycles Per Hour (Assumed): <input type="text" value="60"/>	
Cycles Per Hour (If Known): <input type="text"/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>

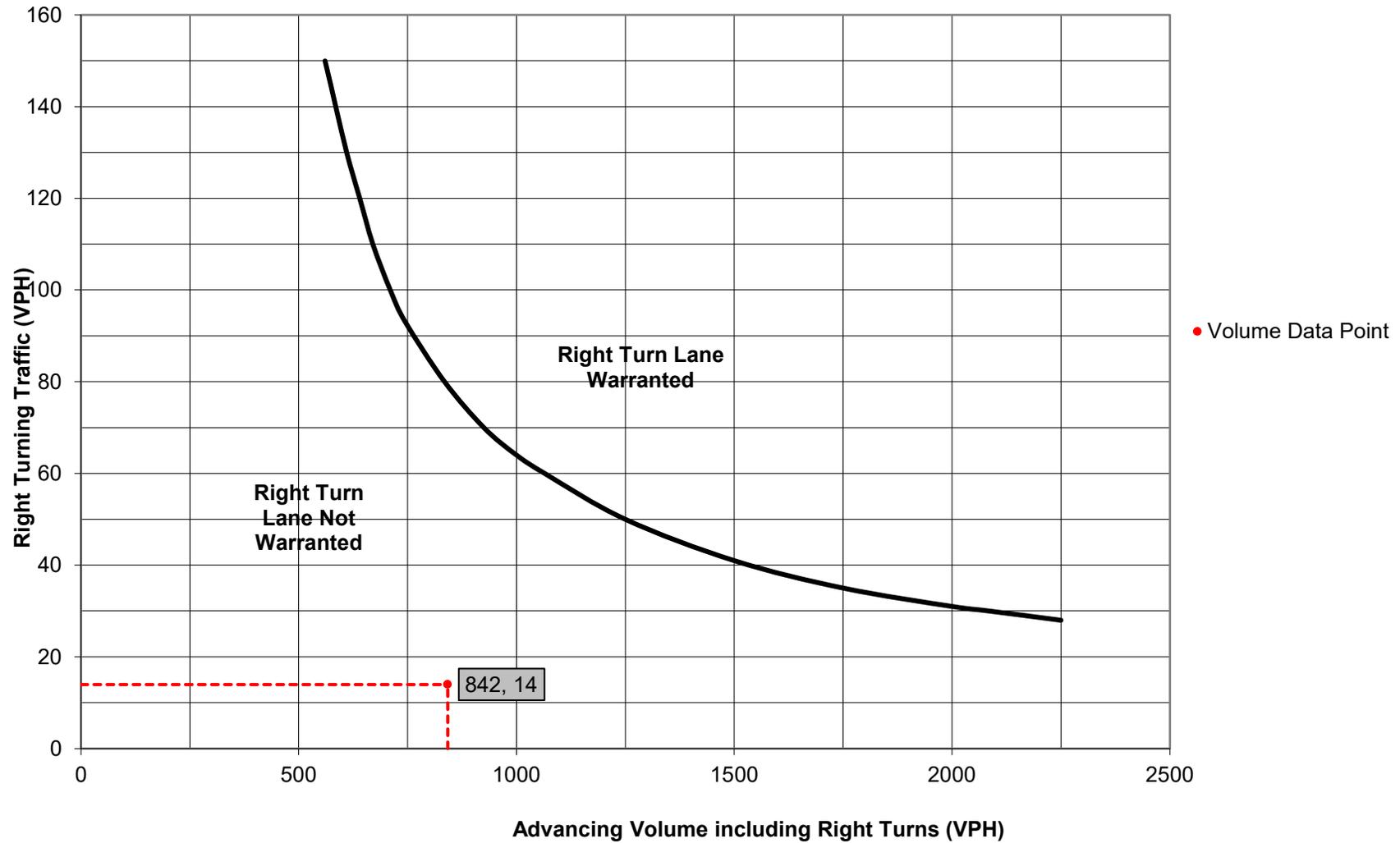
Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	Speed (MPH)					
	25-35		40-45		50-60	
Turn Demand Volume						
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	<input type="text" value="N/A"/>	Feet
Condition B:	<input type="text" value="N/A"/>	Feet
Condition C:	<input type="text" value="N/A"/>	Feet
Required Right Turn Lane Storage Length:	<input type="text" value="N/A"/>	Feet

Additional Findings:

Additional Comments / Justifications:

**Figure 11. Warrant for right turn lanes on four-lane roadways  
(40 mph or lower speeds, unsignalized and signalized intersections)**



## Turn Lane Warrant and Length Analysis Workbook

### STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Phoenixville Borough"/> County: <input type="text" value="Chester County"/> PennDOT Engineering District: <input type="text" value="6"/>	Analysis Date: <input type="text" value="10/9/2024"/> Conducted By: <input type="text" value="PG"/> Checked By: <input type="text" value=""/> Agency/Company Name: <input type="text" value="TPD"/>
Intersection & Approach Description: <input type="text" value="Schuylkill Road and Site Driveway"/>	
Analysis Period: <input type="text" value="2026 Projected"/> Design Hour: <input type="text" value="SAT Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Level"/>	Number of Approach Lanes: <input type="text" value="2"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 1px solid red; padding: 2px; display: inline-block;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

### VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes			N/A	Advancing Volume: <input type="text" value="N/A"/> Opposing Volume: <input type="text" value="N/A"/> Left Turn Volume: <input type="text" value="N/A"/>
	Through	-			N/A	
	Right	No			N/A	
Opposing	Left	No			N/A	% Left Turns in Advancing Volume: <input type="text" value="N/A"/>
	Through	-			N/A	
	Right	Yes			N/A	
Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	No	0	0.0%	N/A	Advancing Volume: <input type="text" value="818"/> Right Turn Volume: <input type="text" value="21"/>
	Through	-	793	1.0%	797	
	Right	-	20	2.0%	21	

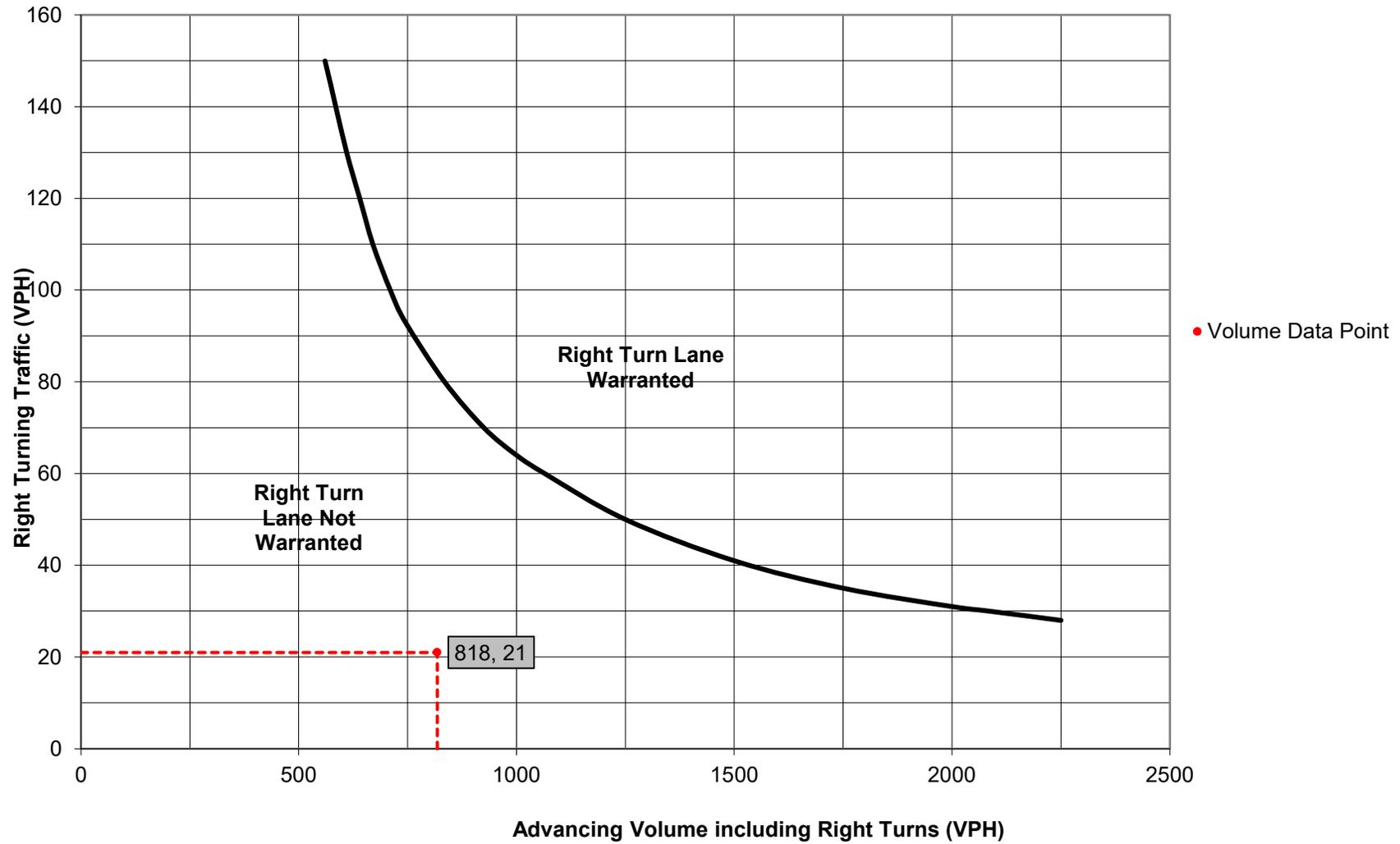
### TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 11"/> Warrant Met?: <input type="text" value="No"/>

### TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="21"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value=""/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>																																								
PennDOT Publication 46, Exhibit 11-6																																									
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th rowspan="3" style="width: 20%;">Type of Traffic Control</th> <th colspan="6" style="background-color: #FFDAB9;">Speed (MPH)</th> </tr> <tr> <th colspan="2" style="background-color: #FFDAB9;">25-35</th> <th colspan="2" style="background-color: #FFDAB9;">40-45</th> <th colspan="2" style="background-color: #FFDAB9;">50-60</th> </tr> <tr> <th colspan="6" style="background-color: #FFDAB9;">Turn Demand Volume</th> </tr> <tr> <th></th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> </tr> </thead> <tbody> <tr> <td style="background-color: #D3D3D3;">Signalized</td> <td>A</td> <td>A</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> </tr> <tr> <td style="background-color: #D3D3D3;">Unsignalized</td> <td>A</td> <td>A</td> <td>C</td> <td>B</td> <td>B or C</td> <td>B</td> </tr> </tbody> </table>		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
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: <input type="text" value="N/A"/> Feet Condition B: <input type="text" value="N/A"/> Feet Condition C: <input type="text" value="N/A"/> Feet Required Right Turn Lane Storage Length: <input type="text" value="N/A"/> Feet																																									
Additional Findings: <input type="text" value="N/A"/>																																									
Additional Comments / Justifications: <div style="border: 1px solid black; height: 40px; width: 100%;"></div>																																									

**Figure 11. Warrant for right turn lanes on four-lane roadways  
(40 mph or lower speeds, unsignalized and signalized intersections)**



# Turn Lane Warrant and Length Analysis Workbook

## STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Phoenixville Borough"/> County: <input type="text" value="Chester County"/> PennDOT Engineering District: <input type="text" value="6"/>	Analysis Date: <input type="text" value="12/18/2024"/> Conducted By: <input type="text" value="PG"/> Checked By: <input type="text"/> Agency/Company Name: <input type="text" value="TPD"/>
Intersection & Approach Description: <input type="text" value="Kimberton Road and Site Driveway"/>	
Analysis Period: <input type="text" value="2026 Projected"/> Design Hour: <input type="text" value="PM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Level"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 2px solid red; padding: 2px; display: inline-block;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Left Turn Lane"/>

## VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	9	2.0%	10	Advancing Volume: <input type="text" value="789"/> Opposing Volume: <input type="text" value="544"/> Left Turn Volume: <input type="text" value="10"/>
	Through	-	775	1.0%	779	
	Right	No	0	0.0%	N/A	
Opposing	Left	No	0	0.0%	N/A	% Left Turns in Advancing Volume: <input type="text" value="1.27%"/>
	Through	-	521	1.0%	524	
	Right	Yes	19	2.0%	20	

Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	No	0	0.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Right Turn Volume: <input type="text" value="N/A"/>
	Through	-	521	1.0%	N/A	
	Right	-	19	2.0%	N/A	

## TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="Figure 1"/> Warrant Met?: <input type="text" value="No"/>	Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>

## TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="10"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text"/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>
--	---

Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	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

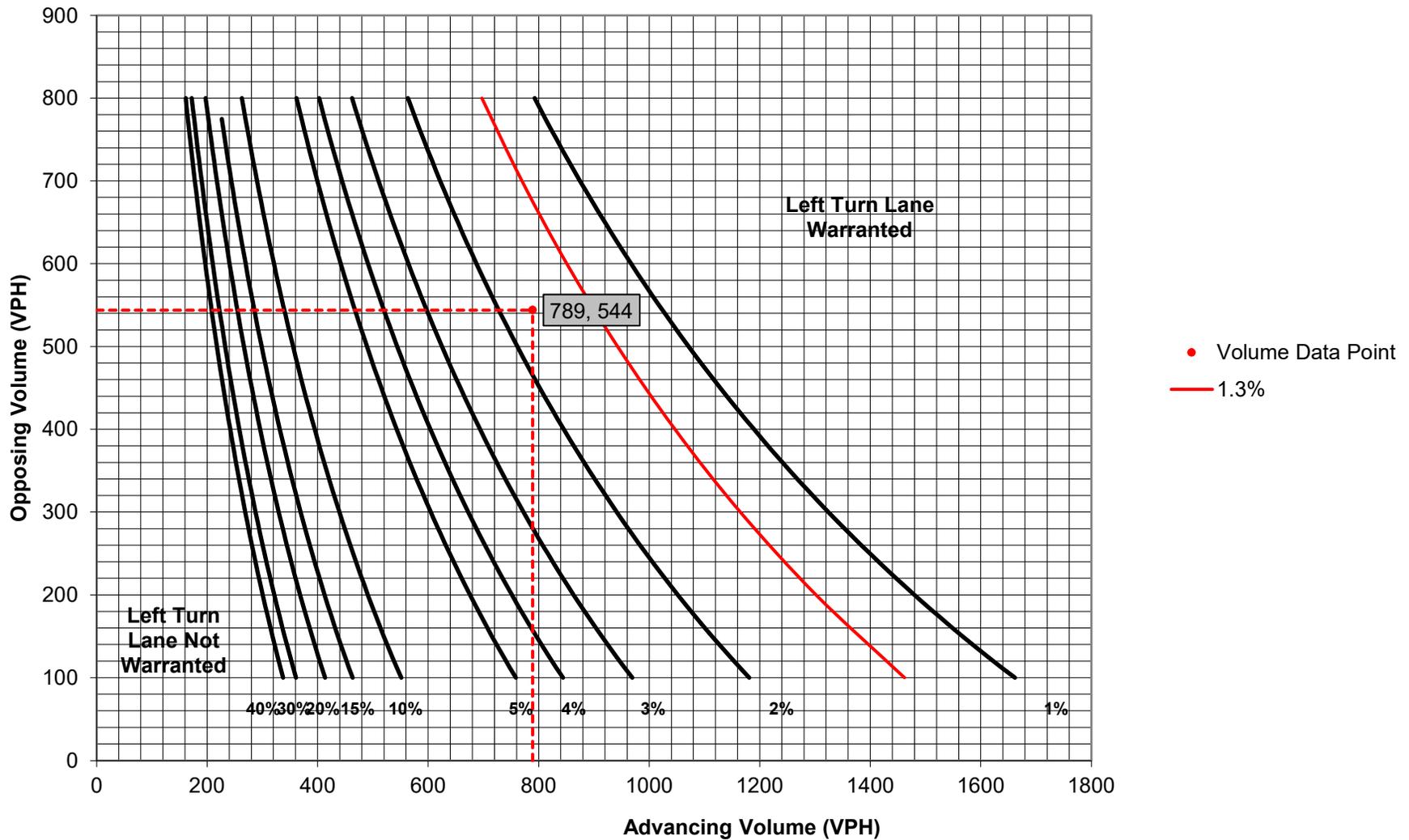
Left Turn Lane Storage Length, Condition A: <input type="text" value="N/A"/> Feet Condition B: <input type="text" value="N/A"/> Feet Condition C: <input type="text" value="N/A"/> Feet Required Left Turn Lane Storage Length: <input type="text" value="N/A"/> Feet
--

Additional Findings:

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: <input type="text" value="Phoenixville Borough"/> County: <input type="text" value="Chester County"/> PennDOT Engineering District: <input type="text" value="6"/>	Analysis Date: <input type="text" value="10/9/2024"/> Conducted By: <input type="text" value="PG"/> Checked By: <input type="text"/> Agency/Company Name: <input type="text" value="TPD"/>
Intersection & Approach Description: <input type="text" value="Kimberton Road and Site Driveway"/>	
Analysis Period: <input type="text" value="2026 Projected"/> Design Hour: <input type="text" value="SAT Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Level"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> Type of Analysis: <span style="border: 1px solid red; padding: 2px;">Type of Analysis</span> Left or Right-Turn Lane Analysis?: <input type="text" value="Left Turn Lane"/>

### VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	20	2.0%	21	Advancing Volume: <input type="text" value="527"/> Opposing Volume: <input type="text" value="532"/> Left Turn Volume: <input type="text" value="21"/>
	Through	-	503	1.0%	506	
	Right	No	0	0.0%	N/A	
Opposing	Left	No	0	0.0%	N/A	% Left Turns in Advancing Volume: <input type="text" value="3.98%"/>
	Through	-	492	1.0%	495	
	Right	Yes	36	2.0%	37	

Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	No	0	0.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Right Turn Volume: <input type="text" value="N/A"/>
	Through	-	492	1.0%	N/A	
	Right	-	36	2.0%	N/A	

### TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="Figure 1"/> Warrant Met?: <input type="text" value="Yes"/>	Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>

### TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="21"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text"/>	Average # of Vehicles/Cycle: <input type="text" value="1.0"/>
--	---

Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	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

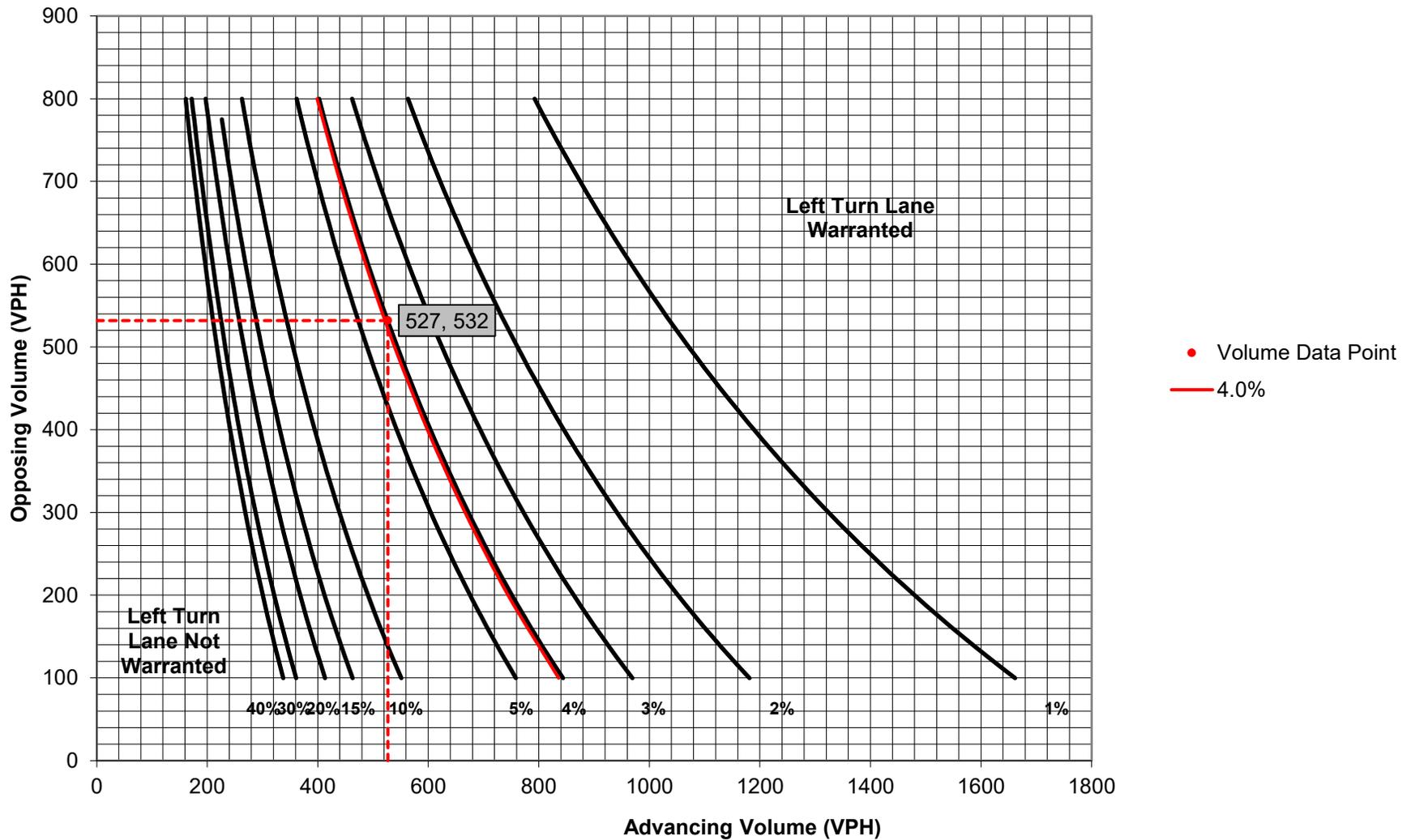
Left Turn Lane Storage Length, Condition A:	<input type="text" value="75"/>	Feet
Condition B:	<input type="text" value="N/A"/>	Feet
Condition C:	<input type="text" value="N/A"/>	Feet
Required Left Turn Lane Storage Length:	<input type="text" value="75"/>	Feet

Additional Findings:

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: <input type="text" value="Phoenixville Borough"/> County: <input type="text" value="Chester County"/> PennDOT Engineering District: <input type="text" value="6"/>	Analysis Date: <input type="text" value="12/18/2024"/> Conducted By: <input type="text" value="PG"/> Checked By: <input type="text" value=""/> Agency/Company Name: <input type="text" value="TPD"/>
Intersection & Approach Description: <input style="width: 100%;" type="text" value="Kimberton Road and Site Driveway"/>	
Analysis Period: <input type="text" value="2026 Projected"/> Design Hour: <input type="text" value="PM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Level"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red; font-weight: bold;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

### VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	9	2.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Opposing Volume: <input type="text" value="N/A"/> Left Turn Volume: <input type="text" value="N/A"/>
	Through	-	775	1.0%	N/A	
	Right	No	0	0.0%	N/A	
Opposing	Left	No	0	0.0%	N/A	% Left Turns in Advancing Volume: <input type="text" value="N/A"/>
	Through	-	521	1.0%	N/A	
	Right	Yes	19	2.0%	N/A	
Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	No	0	0.0%	N/A	Advancing Volume: <input type="text" value="544"/> Right Turn Volume: <input type="text" value="20"/>
	Through	-	521	1.0%	524	
	Right	-	19	2.0%	20	

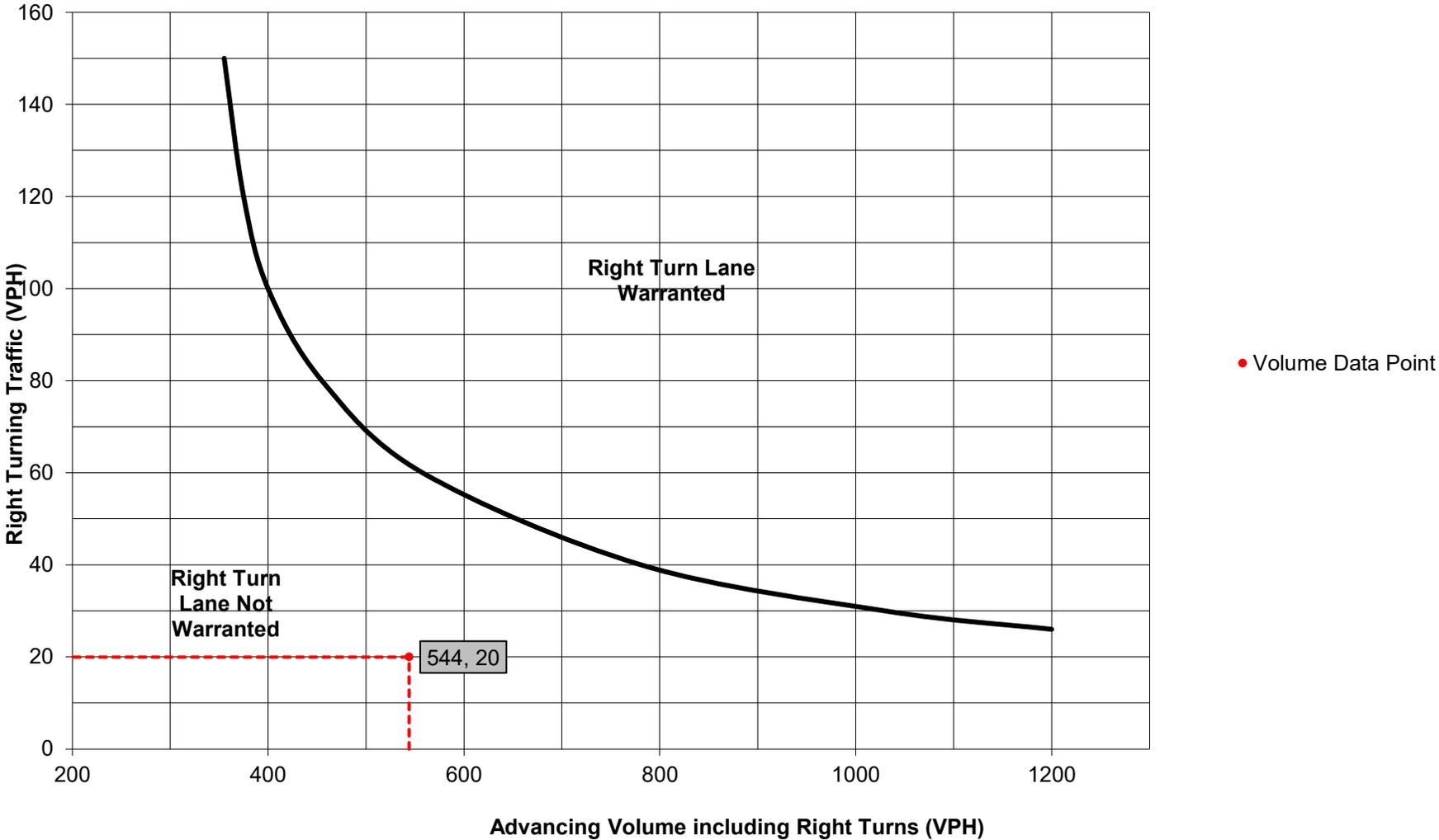
### TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input style="width: 100%;" type="text" value="N/A"/> Warrant Met?: <input style="width: 100%;" type="text" value="N/A"/>	Applicable Warrant Figure: <input style="width: 100%;" type="text" value="Figure 9"/> Warrant Met?: <input style="width: 100%;" type="text" value="No"/>

### TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="20"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value=""/>	Average # of Vehicles/Cycle: <input style="width: 100%;" type="text" value="N/A"/>																																								
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Type of Traffic Control	Speed (MPH)																																								
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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: <input style="width: 100%;" type="text" value="N/A"/> Feet Condition B: <input style="width: 100%;" type="text" value="N/A"/> Feet Condition C: <input style="width: 100%;" type="text" value="N/A"/> Feet Required Right Turn Lane Storage Length: <input style="width: 100%;" type="text" value="N/A"/> Feet																																									
Additional Findings: <input style="width: 100%;" type="text" value="N/A"/>																																									
Additional Comments / Justifications: <input style="width: 100%; height: 40px;" type="text"/>																																									

**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: <input type="text" value="Phoenixville Borough"/> County: <input type="text" value="Chester County"/> PennDOT Engineering District: <input type="text" value="6"/>	Analysis Date: <input type="text" value="10/9/2024"/> Conducted By: <input type="text" value="PG"/> Checked By: <input type="text" value=""/> Agency/Company Name: <input type="text" value="TPD"/>
Intersection & Approach Description: <input type="text" value="Kimberton Road and Site Driveway"/>	
Analysis Period: <input type="text" value="2026 Projected"/> Design Hour: <input type="text" value="SAT Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Level"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> Type of Analysis: <span style="border: 1px solid red; padding: 2px;">Type of Analysis</span> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

### VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	20	2.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Opposing Volume: <input type="text" value="N/A"/> Left Turn Volume: <input type="text" value="N/A"/>
	Through	-	503	1.0%	N/A	
	Right	No	0	0.0%	N/A	
Opposing	Left	No	0	0.0%	N/A	% Left Turns in Advancing Volume: <input type="text" value="N/A"/>
	Through	-	492	1.0%	N/A	
	Right	Yes	36	2.0%	N/A	

Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	No	0	0.0%	N/A	Advancing Volume: <input type="text" value="532"/> Right Turn Volume: <input type="text" value="37"/>
	Through	-	492	1.0%	495	
	Right	-	36	2.0%	37	

### TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 9"/> Warrant Met?: <input type="text" value="No"/>

### TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="37"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value=""/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>
---	---

Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	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: <input type="text" value="N/A"/> Feet Condition B: <input type="text" value="N/A"/> Feet Condition C: <input type="text" value="N/A"/> Feet Required Right Turn Lane Storage Length: <input type="text" value="N/A"/> Feet
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Additional Findings:

Additional Comments / Justifications:

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

