May 10, 2021
TPD#. BRS.00010

Est. 1989

TRAFFIC PLANNING AND DESIGN, INC.

250 King of Prussia Road Parking Structure

Transportation Impact Assessment

Radnor Township, Delaware County, PA

For Submission To:

Radnor Township

250 King of Prussia Road Parking Structure
TRANSPORTATION IMPACT ASSESSMENT

FOR SUBMISSION TO:

Radnor Township, Delaware County, PA

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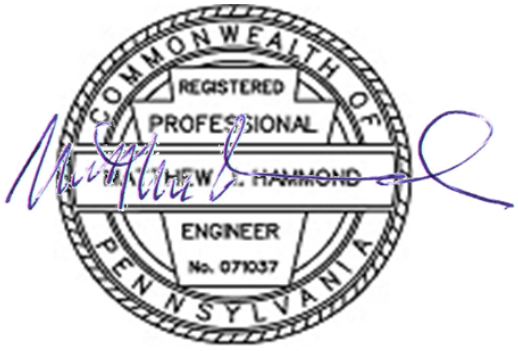

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EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the addition of a proposed Parking Structure within an existing parking area at the existing office building located at 250 King of Prussia Road on the roadway network in Radnor Township, Delaware County, PA. Based on this evaluation, the following conclusions were reached:

- The project scope and the extent of the study area were confirmed with representatives of Radnor Township in a letter dated March 23, 2021. The study area intersections included in this TIS are as follows:
  - King of Prussia Road (S.R. 1021) and Radnor Chester Road (S.R. 1021)/Office Park Driveway;
  - King of Prussia Road (S.R. 1021) and Matsonford Road (S.R. 1038)/Radnor Plaza Driveway.
  - King of Prussia Road and Raider Road/Medical Office Driveway;
  - King of Prussia Road and 250 Office Loop Road/201 King of Prussia Driveway;
  - Radnor Chester Road (S.R. 1021) and Raider Road/Main Line Health Driveway;
  - Radnor Chester Road (S.R. 1021) and 250 Office Loop Road.
- The project site is located on the southeastern corner of the intersection of King of Prussia Road (S.R. 1021) & Radnor Chester Road (SR-1021). The proposed project will consist of replacing surface parking with a parking structure which will add 156 additional off-street parking spaces.
- Access to the site is currently via two (2) full-access driveways: one (1) to King of Prussia Road (S.R. 1021) located approximately 640 feet east of Radnor Chester Road (S.R. 1021), and one (1) to Radnor Chester Road (S.R. 1021) located approximately 485 feet south of King of Prussia Road (S.R. 1021). These access locations will remain unchanged. The internal circulation road which has five (5) full access points to the existing parking lot(s), is proposed to now have three (3) full access points from the parking structure.
- All existing driveway location sight distances will exceed PennDOT's Safe Stopping Sight Distance (SSSD) criteria.
- The existing office building located at 250 King of Prussia Road, will continue to operate as a General/Medical office building. The office building was recently fully occupied by Penn Medicine at Radnor which has relocated to a new facility on King of Prussia Road. It is expected the office building, at full occupancy, will generate approximately 349 trips during the weekday A.M. peak hour and 420 trips during the weekday P.M. peak hour.
- Under 2023 projected conditions with the redistribution of the 250 King of Prussia Road redevelopment trips with the proposed parking structure, the study area intersections will operate at the **same overall intersection level of service (ILOS) as under 2023 Base Conditions**, during the weekday A.M. and P.M. peak hours. The ILOS at the site driveway intersections will operate at **LOS D or better** under 2023 projected conditions during the weekday A.M. and P.M. peak hours.
- 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.
- The existing office building does not have the required number of parking spaces and the parking structure is proposed to reduce the degree of the parking nonconformity as part of a building renovation that will not increase the floor area of the building. TPD understands that Penn Medicine at Radnor utilized valet parking which would indicate that the number of vehicles arriving at the site could not be accommodated in the available parking spaces.

TABLE I
OVERALL INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Weekday A.M. Peak Hour			
	Existing	Opening Year 2023		Meets LOS Requirements?
		Base	Projected	
King of Prussia Road (S.R. 1021) & Radnor Chester Road (S.R 1021)/Office Park Driveway	F (186.7)	F (183.0)	F (174.0)	YES
Raider Road/Main Line Health Driveway & Radnor Chester Road (S.R. 1021)	C (22.6)	D (35.9)	D (35.9)	YES
King of Prussia Road (S.R. 1021) & Matsonford Road (S.R. 1038)/Radnor Plaza Driveway	D (46.8)	E (68.6)	E (68.6)	YES
Raider Road/Medical Office Driveway & King of Prussia Road	E (76.4)	F (130.6)	F (130.6)	YES
King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway	A (0.4)	A (1.8)	A (2.5)	YES
250 Office Loop Road & Radnor Chester Road	A (0.3)	A (2.5)	A (1.1)	YES

Base = No-Build scenario
Projected = Build scenario
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.
[1] = Projected conditions with implementation of recommended improvements

TABLE I (CONT.)
OVERALL INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Weekday P.M. Peak Hour			
	Existing	Opening Year 2023		Meets LOS Requirements?
		Base	Projected	
King of Prussia Road (S.R. 1021) & Radnor Chester Road (S.R 1021)/Office Park Driveway	F (91.1)	F (107.3)	F (80.4)	YES
Raider Road/Main Line Health Driveway & Radnor Chester Road (S.R. 1021)	A (8.3)	A (8.2)	A (8.2)	YES
King of Prussia Road (S.R. 1021) & Matsonford Road (S.R. 1038)/Radnor Plaza Driveway	C (34.6)	E (56.4)	E (56.4)	YES
Raider Road/Medical Office Driveway & King of Prussia Road	B (19.1)	F (115.9)	F (115.9)	YES
King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway	A (0.7)	A (7.6)	D (28.4)	YES
250 Office Loop Road & Radnor Chester Road	A (0.4)	A (3.9)	A (2.4)	YES

Base = No-Build scenario
Projected = Build scenario
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.
[1]= Projected conditions with implementation of recommended improvements

INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Assessment (TIA) for the existing office building located at 250 King of Prussia Road in Radnor Township, Delaware County, Pennsylvania. As part of renovations proposed to the property, the Applicant has proposed to construct structured parking which will replace a portion of the existing surface parking, however, increase the number of off-street parking spaces available. The project site is located on the southeastern corner of the intersection of King of Prussia Road (S.R. 1021) & Radnor Chester Road (S.R. 1021) as shown in **Figure 1**. The project is proposed to be completed by 2023 and will consist of a parking structure which will add 156 additional off-street parking spaces as shown in **Figure 2**. The land use context of the site and surrounding area is defined as Suburban Center in the *Smart Transportation Guidebook,* dated March 2008.

The project scope and the extent of the study area were confirmed with representatives of Radnor Township in a letter dated March 23, 2021. All relevant correspondence pertaining to this project has been included in **Appendix A**.

Site Access Locations

Access to the site is currently via two (2) full-access driveways: one (1) to King of Prussia Road (S.R. 1021) located approximately 640 feet east of Radnor Chester Road (S.R. 1021), and one (1) to Radnor Chester Road (S.R. 1021) located approximately 485 feet south of King of Prussia Road (S.R. 1021). These access locations will remain unchanged.

Internal Site Circulation

The internal circulation road which has five (5) full access points to the existing parking lot(s), is proposed to now have three (3) full access points from the parking structure.

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
King of Prussia Road	State (S.R. 1021)	Urban Minor Arterial	East-West	8,751	35 mph
Radnor Chester Road	State (S.R. 1021)	Urban Minor Arterial	North-South	8,751	35 mph
Matsonford Road	State (S.R. 1038)	Urban Minor Collector	North-South	5,979	35 mph
Raider Road	Local	Local Road	East-West	N/A	Not Posted

Land Use Context

In Chapter 4 of the *Smart Transportation Guidebook*, dated March 2008, there is guidance pertaining to defining the land use context(s) for a given area. Based upon review of this information, the land uses surrounding the proposed site best fits the Suburban Center designation, as described below:

> ***Suburban Center,*** *"Often a mixed use, cohesive collection of land uses that may include residential, office, retail, and restaurant uses where commercial uses serve surrounding neighborhoods. These areas are typically designed to be accessible by car and may include large parking areas and garages. They are less accommodating to pedestrians than town centers, and opportunities to cross the primary roadway can be limited. On-street parking may or may not be provided."*

Roadway Type

In Chapter 5 of the *Smart Transportation Guidebook*, there is guidance pertaining to defining the transportation context(s) for a given area. Comparing the existing condition roadway characteristics to the various options presented in Table 5.1 of the *Smart Transportation Guidebook*, the study area roadways best fit the following categories, as described below:

Community Arterial, traffic volumes of 5,000 to 25,000 vehicles per day, intersection spacing of 300 to 1,320 feet, a desired operating speed of 25-55 mph, and a description as follows: *"often classified as Minor Arterial in traditional classification but may include road segments classified as Principal Arterial."*

- Radnor Chester Road (S.R. 1021)
- King of Prussia Road (S.R. 1021)

Community Collector, traffic volumes of 5,000 to 15,000 vehicles per day, intersection spacing of 300 to 660 feet, a desired operating speed of 25-55 mph, and a description as follows: *"often similar in appearance to a community arterial. Typically classified as Major Collector."*

- Matsonford Road (S.R. 1038

Local Road, traffic volumes of <3,000 vehicles per day, intersection spacing of 010 to 660 feet, a desired operating speed of 20-30 mph.

- Raider Road

Bicycle and Pedestrian Facilities

Based on observations during field visits at the study area intersections, sidewalks and crosswalks currently accommodate pedestrian and bicycle traffic in the vicinity of the proposed development. The closest traffic signal is the intersection of King of Prussia Road and Radnor Chester Road/Office Park Driveway is equipped with pedestrian crossing signals, pedestrian push buttons and pedestrian crosswalks.

Mass Transit Facilities

SEPTA provides Delaware County with public transportation by regional rail and bus. Regional rail service is available in the immediate vicinity of the proposed site via the Radnor Train Station. Two SEPTA bus routes (105,106) have scheduled routes near the proposed project. The closest bus stop is on Radnor Chester Road, approximately 0.1 miles from the proposed site.

EXISTING TRAFFIC CONDITIONS

Manual Turning Movement Counts

Manual traffic counts were conducted on 15-minute intervals during the weekday morning (7:00 to 9:00 A.M.) and weekday evening (4:00 to 6:00 P.M.) peak periods. Data pertaining to heavy vehicles, pedestrians and transit vehicles were observed during the manual counts. Peak hours and count dates for the study area intersections are identified in **Table 2**. Raw data condition traffic volumes for the weekday A.M. and weekday P.M. are illustrated in **Figures 3-4**, respectively. A portion of the intersections within the study area utilized the 2020 No-Build Condition volumes contained in the *Traffic Impact Study Mixed Medical Facility*, last revised April 2018, prepared by Pennoni Associates Inc. (Pennoni Report), for the existing volume conditions.

TABLE 2
MANUAL TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour[1]
Raider Road/Main Line Health Driveway & Radnor Chester Road	Thursday, April 8, 2021	Weekday A.M.	8:00 to 9:00 A.M.
		Weekday P.M.	5:00 to 6:00 P.M.
King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway	Thursday, April 8, 2021	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	4:00 to 5:00 P.M.
250 Office Loop Road & Radnor Chester Road	Thursday, April 8, 2021	Weekday A.M.	8:00 to 9:00 A.M.
		Weekday P.M.	5:00 to 6:00 P.M.
King of Prussia Road & Radnor Chester Road/Office Park Driveway	2020 No-Build Condition[2]	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	4:45 to 5:45 P.M.
King of Prussia Road & Matsonford Road/Radnor Plaza Driveway	2020 No-Build Condition[2]	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	5:00 to 6:00 P.M.
Raider Road/Medical Office Driveway & King of Prussia Road	2020 No-Build Condition[2]	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	5:00 to 6:00 P.M.

[1]Peak Hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.
[2]Pennoni's Traffic Impact Study Mixed Medical Facility, last revised April 2018

COVID ADJUSTMENT

Due to COVID, TPD compared the peak hour turning movement counts that were counted on April 8, 2021 to the surrounding roadway network counts from the 2020 No-Build Condition Figure 6 of the Pennoni

Report. An adjustment factor was applied to the TPD 2021 turning movement counts to account for the decrease in overall volume likely associated with COVID-19.

TABLE 3
COVID ADJUSTMENT AM PEAK HOUR

Location	Year of Historical Count[1]	Total Volume (w/ Growth)	2021 TPD Count	% drop in traffic
Main Line Health Driveway/Raider Road & Radnor Chester Road	2020	1056	945	-10.5%
King of Prussia Road & 250 Office Loop Road/201King of Prussia Driveway	2020	1299	871	-32.9%
250 Office Loop Road & Radnor Chester Road	2020	1086	682	-37.2%
Average				**-26.87%**

[1] Historical Count Information was taken from 2020 No-Build Condition in the Pennoni Report.

AM Peak Hour Summary:
Overall TPD applied an overall 1.27 COVID adjustment factor to all turning movements that were counted on Wednesday April 8, 2021 for the weekday AM peak hour.

TABLE 4
COVID ADJUSTMENT PM PEAK HOUR

Location	Year of Historical Count[1]	Total Volume (w/ Growth)	2021 TPD Count	% drop in traffic
Main Line Health Driveway/Raider Road & Radnor Chester Road	2020	1285	882	-31.4%
King of Prussia Road & 250 Office Loop Road/201King of Prussia Driveway	2020	1398	884	-36.8%
250 Office Loop Road & Radnor Chester Road	2020	1309	717	-45.2%
Average				**-37.80%**

[1] Historical Count Information was taken from 2020 No-Build Condition in the Pennoni Report.

PM Peak Hour Summary:
Overall TPD applied an overall 1.38 COVID adjustment factor to all turning movements that were counted on Wednesday April 8, 2021 for the weekday PM peak hour.

The TPD turning movement counts listed in previous **Tables 3-4** were adjusted utilizing the surrounding roadway network count data from the Pennoni Report. Adjusted COVID condition traffic volumes for the weekday A.M. and weekday P.M. are illustrated in **Figures 5-6**, respectively. Manual traffic count data sheets are provided in **Appendix C**. The Pennoni Report is provided in **Appendix D**.

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 2020 to July 2021 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT

BPR suggests using a background growth trend factor of 0% per year in Delaware County for urban non-interstate roadways. As such, the background growth factor was applied annually to yield overall growth percentages of 0% (0% per year, compounded over 2 years) for the 2023 opening year.

Nearby Proposed Developments

Base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the opening year (2023) of the proposed development. Based on discussions with Radnor Township staff, the following nearby planned developments were specifically included in this study:

145 King of Prussia Road Mixed Medical Facility is a proposed 250,000 square feet mixed medical use building, 150,000 square feet general office building, and 75,000 square foot 120 room hotel. The proposed site utilizes three (3) driveways along King of Prussia Road. Trip distributions are provided in Figure 8 of the Pennoni Report. This site is still under construction, but some buildings are completed and operational today. The trips for this site were not included in the Covid adjusted existing counts because of the methodology stated in the Covid adjustment. Trip distribution volumes summarized for the weekday A.M. and weekday P.M. are illustrated in **Figures D-1 & D-2**.

250 King of Prussia Road Development is a proposed 159,584 square feet building for 111,709 square feet medical office and 47,875 square feet for general office. The proposed site utilizes two existing driveways, one to King of Prussia Road and one to Radnor Chester Road. Trip distributions were developed utilizing TPD COVID adjusted existing condition volumes and distributing trips along the local roadway network. These trips were distributed without the internal circulation from the proposed parking structure. Summarized trip distribution volumes summarized for the weekday A.M. and weekday P.M. are illustrated in **Figures D-3 & D-4**. ***It should be noted that the above is the subject development and the traffic associated with the office building was included in base conditions to determine the effect, if any, the addition of the parking structure and modifications to the internal access drive would have on the roadway network, as there are no changes proposed to the office building that would affect the amount of traffic previously generated.***

The additional traffic volumes due to background growth and background developments were added to the existing covid adjusted traffic data to produce 2023 base (no-build) condition traffic volumes. Base (no-build) condition volumes for the weekday A.M. and weekday P.M. are illustrated in **Figures 7-8** for the 2023 opening year conditions. Trip distributions for the background developments are provided in **Appendix D**.

SCHEDULED ROADWAY IMPROVEMENTS

Programmed Improvements

Based on a review of the Pennsylvania/DVRPC/HATS Transportation Improvement Program (TIP) there are no programmed roadway improvements in the vicinity of the proposed project. However, there are improvements included in the Pennoni Report associated with the construction of the 145 King of Prussia Road Mixed Medical Facility. These improvements include:

- King of Prussia Road and Matsonford Road/Park Driveway
  - Adjusted signal timings.
- King of Prussia Road and Radnor Chester Road
  - Adjusted signal timings.

- King of Prussia Road and Septa Station Driveway
    - Restripe southbound King of Prussia Road to provide a dedicated left turn lane.

- King of Prussia Road and Raider Road/Medical Office Driveway
    - Provide left turn lane on both approaches of King of Prussia Road.
    - Widen east side of King of Prussia Road to provide two continuous northbound lanes from Lancaster Avenue to the signalized intersection at the Medical Office Driveway/Raider Road.
    - Install an actuated traffic signal coordinated with the signal at King of Prussia Road & Radnor-Chester Road.

- King of Prussia Road and South Site Driveway
    - Restripe northbound King of Prussia Road to provide shared/right turn lane.
    - Widen the east side of King of Prussia Road to provide two continuous northbound lanes from the south driveway to the Medical Office Driveway/Raider Road, with a transition into a dedicated right turn lane.

- Lancaster Avenue and NB Off Ramps/King of Prussia Road
    - Restripe northbound I-76 off-ramp at Lancaster Avenue to provide shared/right turn lane.

- Lancaster Avenue and I-476 SB Off Ramp
    - Adjusted signal timings.

- Lancaster Avenue and I-476 NB On Ramp/Hillside Circuit
    - Adjusted signal timings.

- Lancaster Avenue and Radnor Chester Road
    - Adjusted signal timings.

PROPOSED SITE ACCESS

Access to the site is currently via two (2) full-access driveways: one (1) to King of Prussia Road (S.R. 1021) located approximately 640 feet east of Radnor Chester Road (S.R. 1021), and one (1) to Radnor Chester Road (S.R. 1021) located approximately 485 feet south of King of Prussia Road (S.R. 1021). These access locations will remain unchanged. The internal circulation road which has five (5) full access points to the existing parking lot(s), is proposed to now have three (3) full access points from the parking structure, as shown in **Figure 2.**

Sight Distance Analysis

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

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

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

Tables 5-7 show the measured, desirable, acceptable (SSSD), and required sight distances at the site driveways for the proposed parking structure for vehicles entering and exiting. The site driveways along the Office Loop Road have no posted speed limit signs, therefore a speed limit of 25 mph was assumed.

TABLE 5
SIGHT DISTANCE ANALYSIS
ACCESS 1 - EXISTING FULL ACCESS TO REMAIN

	Direction	Speed	Grade1	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	25 mph	1%	250	145	**200**
	To the right	25 mph	-3%	195	151	**275**
Entering Left Turns	Approaching same direction	25 mph	-3%	190	151	**200**
	Approaching opposite direction	25 mph	1%	190	145	**230**

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

TABLE 6
SIGHT DISTANCE ANALYSIS
ACCESS 2 - EXISTING FULL ACCESS TO REMAIN

	Direction	Speed	Grade1	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	25 mph	3%	250	143	**335**
	To the right	25 mph	-2%	195	150	**155**
Entering Left Turns	Approaching same direction	25 mph	-2%	190	150	**335**
	Approaching opposite direction	25 mph	3%	190	143	**185**

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

TABLE 7
SIGHT DISTANCE ANALYSIS
ACCESS 3 - EXISTING FULL ACCESS TO REMAIN

	Direction	Speed	Grade1	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	25 mph	4%	250	142	**230**
	To the right	25 mph	-4%	195	153	**225**
Entering Left Turns	Approaching same direction	25 mph	-4%	190	153	**260**
	Approaching opposite direction	25 mph	4%	190	142	**300+**

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

As shown in **Tables 5-7** above and driveway locations shown in **Figure 2**, the measured sight distances at all existing site driveways exceed PennDOT's safe stopping sight distance (SSSD) requirements. Even though PennDOT's desirable sight distance requirements are not met at two (2) of the site driveways, the access changes proposed as part of the addition of the parking structure will improve the overall circulation by eliminating two (2) existing full access driveways.

TRIP GENERATION

The trip generation rates for renovated building were obtained from the *Trip Generation Manual*, Tenth Edition, 2017, an Institute of Transportation Engineers (ITE) Informational Report. The statistics in *Trip Generation* are empirical data based on more than 4,800 trip generation studies. The data are categorized by Land Use Codes, with total vehicular trips for a given land use estimated using an independent variable and statistically generated rates or equations.

The existing office building located at 250 King of Prussia Road, will continue to operate as a General/Medical office building, with an assumed split of approximately 70% medical office (approximately 111,709 sf) and 30% general office (approximately 47,875 sf). This split is the current split, and it is assumed to continue for purposes of this study to be conservative. Based on this split in uses internal to the building, land use 710 (General Office Space) and 720 (Medical-Dental Office Building) were utilized for purposes of determining the trips generated by the existing building during the following time periods: (1) average weekday; (2) weekday A.M. peak hour; and (3) weekday P.M. peak hour. **Table 8** shows the rates/equations and directional percentages for the analyzed time periods.

TABLE 8
ITE TRIP GENERATION DATA

Land Use	ITE #	Time Period	Equations/Rates	Entering %	Exiting %
Medical-Dental Office	712	Weekday A.M. Peak Hour	T = 2.78*(X)	78%	22%
		Weekday P.M. Peak Hour	T = 3.46*(X)	28%	72%
		Weekday	T = 3.10*(X)	50%	50%
Office	710	Weekday A.M. Peak Hour	Ln(T) = 0.80*Ln(X) + 1.55	88%	12%
		Weekday P.M. Peak Hour	T = 1.12*(X) + 78.81	17%	83%
		Weekday	Ln(T) = 0.80*Ln(X) + 1.55	50%	50%

T = number of site-generated vehicular trips
X = independent variable (ksf, thousand square feet of gross leasable area)

The trip generation is shown in **Table 9.**

TABLE 9
PROPOSED TRIP GENERATION SUMMARY

Land Use	Size (X)	Total Trips	New Trips		
			Total	Enter	Exit
Weekday A.M. Peak Hour					
Medical-Dental Office	111.71	311	311	243	68
Office	47.88	56	56	48	8
Total	--	**367**	**367**	**291**	**76**
Weekday P.M. Peak Hour					
Medical-Dental Office	111.71	387	387	108	279
Office	47.88	55	55	9	46
Total	--	**442**	**442**	**117**	**325**
Weekday					
Medical-Dental Office	111.71	3888	3888	1944	1944
Office	47.88	466	466	233	233
Total	--	**4354**	**4354**	**2177**	**2177**

X = Independent Variable (ksf, thousand square feet)

It should be noted, the office building is currently occupied by a 6,500 medical office user. It is also noted that the entire building was recently fully occupied by Penn Medicine at Radnor. The trips associated with this user, are shown in **Table 10**. A comparison of the additional trips generated assuming full occupancy of the building, taking into account the existing user, is shown in **Table 11**.

TABLE 10
EXISTING TRIP GENERATION SUMMARY

Time Period	250 King of Prussia Road		
	Enter	Exit	Total
Weekday	113	113	**226**
A.M. Peak Hour	14	4	**18**
P.M. Peak Hour	6	16	**22**

TABLE 11
TRIP GENERATION – COMPARISON SUMMARY

Development Scenarios	New Trips		
	Total	Enter	Exit
Average Weekday			
Existing Medical Office Building	226	113	113
Proposed Medical Office and General Office Building	4354	2177	2177
Difference	***+4128***	***+2064***	***+2064***
Weekday AM			
Existing Medical Office Building	18	14	4
Proposed Medical Office and General Office Building	367	291	76
Difference	***+349***	***+277***	***+72***
Weekday PM			
Existing Medical Office Building	22	6	16
Proposed Medical Office and General Office Building	442	117	325
Difference	***+420***	***+111***	***+309***

Based on the trip generation analysis summarized in **Table 11**, it is expected the office building, at full occupancy, will generate approximately 349 trips during the weekday A.M. peak hour and 420 trips during the weekday P.M. peak hour. It is noted that this should be no different than the recent full occupancy of the building by Penn Medicine at Radnor.

TRIP DISTRIBUTION

The distribution of trips generated by the proposed development was based on the local road network, existing traffic patterns, the proposed site modifications, and the existing site driveway locations. The new trips for the project were distributed to the local roadway network based on the percentages shown in **Tables 12.**

TABLE 12
TRIP DISTRIBUTION PERCENTAGES

Direction - To/From	Assignment (To/From)	Distribution Percentage
East	via King of Prussia Road	31%
West	via King of Prussia Road	27%
North	via Matsonford Road	12%
	via Radnor Chester Road	10%
South	via Matsonford Road	10%
	via Radnor Chester Road	10%

The internal circulation road which has five (5) full access points to the existing parking lot(s), is proposed to now have three (3) full access points from the parking structure. Based on these changes, modifications to the trip distribution were assumed. The modifications in trip distribution for the two (2) access driveways via King of Prussia Road and via Radnor Chester Road are shown in **Tables 13-14.**

TABLE 13
TRIP DISTRIBUTION PERCENTAGES – Without Proposed Parking Structure

Accesses	Assignment (To/From)	Distribution Percentage
250 Office Loop Road Access	via King of Prussia Road	55%
	via Radnor Chester Road	45%

TABLE 14
TRIP DISTRIBUTION PERCENTAGES – With Proposed Parking Structure

Accesses	Assignment (To/From)	Distribution Percentage
250 Office Loop Road Access	via King of Prussia Road	75%
	via Radnor Chester Road	25%

The assignment of site-generated trips for the existing development with the proposed parking structure during the weekday A.M. and P.M., peak hours are shown in **Figures 9-10**, respectively. The trip distribution and assignment percentages information for the original trip distribution without the proposed parking structure are included in **Appendix D** and **Figures D-3 & D-4**.

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The redistribution of trips associated with the proposed parking structure were added to the 2023 base (no-build) condition traffic volumes to develop 2023 projected (build) condition traffic volumes. Projected condition traffic volumes for the opening year of 2023 for the weekday A.M. and P.M peak hours are shown in **Figures 11-12**, respectively. Traffic volume development worksheets are contained in **Appendix E**. Again, it is noted that the trip generation should be no greater than the recent full occupancy of the building by Penn Medicine at Radnor.

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 15**. 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 15
LEVEL OF SERVICE CRITERIA
UNSIGNALIZED AND SIGNALIZED INTERSECTIONS [1]

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

[1] *Obtained from Exhibits 18-4 and 19-1 of the Transportation Research Board's Highway Capacity Manual 2010*

CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted for the weekday A.M. and P.M. peak hours at the study area intersections. These analyses were conducted according to the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM) using *Synchro 10* software, a Trafficware product.

The following conditions were analyzed, as applicable:

- Existing conditions;
- 2023 Base conditions (Build-out year without parking structure);
- 2023 Projected conditions (Build-out year with parking structure).

It should be noted that based on methodologies contained in Chapter 10 of PennDOT's Publication 46, TPD adjusted the following 2010 HCM default values in the *Synchro 8* 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.

- Optimize Signal Timings for Existing, Base, and Projected Conditions for the Main Line Health Driveway/Raider Road & Radnor Chester Road and Medical Office Driveway/Raider Road & King of Prussia Road intersections due to adaptive signal timings.

In addition, capacity analyses were conducted at the site driveway intersections under the 2023 projected conditions. The capacity analysis worksheets are included in **Appendix F**. The PennDOT-approved signal plans are included in **Appendix G.**

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 July 2017 contain the following criteria regarding levels of service:

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

LEVELS OF SERVICE IN THE STUDY AREA

Level of service (LOS) matrices for the study area intersections are shown in **Tables 16** for the weekday A.M. and weekday P.M. peak hours. Per PennDOT standards, the signal timings at the signalized study area intersections have been optimized under base conditions.

TABLE 16
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Condition	Opening Year 2023		Existing Condition	Opening Year 2023	
			Base	Projected[1]		Base	Projected[1]
King of Prussia Road & Radnor Chester Road/Office Park Driveway	EB L	E (63.3)	E (63.4)	E (63.4)	A	B	B
	EB T	B	C	C	C	D	D
	EB R	A	A	A	A	A	A
	WB L	C	C	D	B	D	D
	WB T/R	F (71.6)	F (82.9)	F (89.4)	A	A	A
	NB L/T	F (535.2)	F (548.6)	F (525.5)	F (354.2)	F (391.4)	F (296.1)
	NB R	B	B	B	C	B	B
	SB L/T/R	C	C	C	D	D	D
	ILOS	**F (186.7)**	**F (183.0)**	**F (174.1)**	**F (91.1)**	**F (107.3)**	**F (80.4)**
Main Line Health Driveway/Raider Road & Radnor Chester Road	EB L	C	C	C	D	D	D
	EB T/R	C	C	C	D	D	D
	WB L	D	D	D	D	D	D
	WB T/R	C	C	C	C	C	C
	NB L	A	A	A	A	A	A
	NB T/R	C	F (58.9) *	F (58.9) *	A	A	A
	SB L	B	C	C	A	A	A
	SB T/R	A	A	A	A	A	A
	ILOS	**C (22.6)**	**D (35.9)**	**D (35.9)**	**A (8.3)**	**A (8.2)**	**A (8.2)**
King of Prussia Road & Radnor Plaza Driveway/Matsonford Road	EB L	F (84.5)	F (122.2)	F (122.2)	B	C	C
	EB T/R	B	C	C	C	D	D
	WB L	B	C	C	D	D	D
	WB T	F (64.7)	F (111.5)	F (111.5)	D	F (95.8)	F (95.8)
	WB R	A	A	A	A	A	A
	NB L	C	C	C	C	C	C
	NB T/R	C	C	C	B	B	B
	SB L	D	D	D	D	D	D
	SB T/R	C	C	C	B	B	B
	ILOS	**D (46.8)**	**E (68.6)**	**E (68.6)**	**C (34.6)**	**E (56.4)**	**E (56.4)**

Base = No-Build scenario; Projected = Build scenario
[1] = Projected conditions with implementation of recommended improvements
ILOS = Overall Intersection Level of Service; Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.

TABLE 16 (CONT.)
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Condition	Opening Year 2023		Existing Condition	Opening Year 2023	
			Base	Projected[1]		Base	Projected[1]
Raider Road/Medical Office Driveway & King of Prussia Road	EB L/T/R	D	D	D	D	C	C
	WB L	A	D	D	A	D	D
	WB T/R	A	C	C	A	C	C
	NB L	A	B	B	A	C	C
	NB T	F (115.9)	F (239.2)	F (239.2)	B	B	B
	NB R	A	B	B	A	A	A
	SB L	D	F (93.7)	F (93.7)	D	D	D
	SB T/R	B	C	C	C	F (180.1)	F (180.1)
	ILOS	**E (76.4)**	**F (130.6)**	**F (130.6)**	**B (19.1)**	**F (115.9)**	**F (115.9)**
King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway	EB L	B	B	B	B	B	B
	EB T	A	A	A	A	A	A
	EB R	A	A	A	A	A	A
	WB L	A	B	B	A	B	B
	WB T/R	A	A	A	A	A	A
	NB L/T	C	F (52.0)	F (64.3)	D	F (117.6)	F (321.9)
	NB R	B	B	B	B	B	B
	SB L/T/R	C	D	E (35.5)	C	E (39.9)	E (40.6)
	ILOS	**A (0.4)**	**A (1.8)**	**A (2.5)**	**A (0.7)**	**A (7.6)**	**D (28.4)**
250 Office Loop Road & Radnor Chester Road	WB L/R	C	E (38.9)	D	C	D	D
	NB T	A	A	A	A	A	A
	NB R	A	A	A	A	A	A
	SB L/T	B	B	B	A	A	A
	ILOS	**A (0.3)**	**A (2.5)**	**A (1.1)**	**A (0.4)**	**A (3.9)**	**A (2.4)**

Base = No-Build scenario
Projected = Build scenario
[1]= Projected conditions with implementation of recommended improvements
ILOS = Overall Intersection Level of Service; Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.

As can be seen in **Table 16**, under 2023 projected conditions with the redistribution of the trips associated with the proposed parking structure, the study area intersections will operate at the **same overall intersection level of service (ILOS) as under 2023 Base Conditions**, during the weekday A.M. and P.M. peak hours. The ILOS at the site driveway intersections will operate at **LOS D or better** under 2023 projected conditions during the weekday A.M. and P.M. peak hours. The capacity analysis worksheets are included in **Appendix F**. It is also noted again that the trip generation should not exceed that associated with the prior full occupancy of the building by Penn Medicine at Radnor.

95TH PERCENTILE QUEUE ANALYSIS

Queue analyses were conducted at the study area intersections using *Synchro 8* software. For this analysis, the 95th percentile queue is defined as the queue length that is exceeded in 5% of the signal cycles. As an example, for a signal with a 90-second cycle, this means that the 95th percentile queue length will be exceeded during 2 of the 40 signal cycles that occur during the peak hour. The queue analysis results are summarized in **Table 17** for the analyzed peak hours.

TABLE 17
95TH PERCENTILE QUEUE ANALYSIS

Intersection	Lane Group	2023 Base Conditions			2023 Projected Conditions		
		Existing Storage Length	95th Percentile Queue Length (ft)		Proposed Storage Length	95th Percentile Queue Length (ft)	
			A.M.	P.M.		A.M.	P.M.
King of Prussia Road & Radnor Chester Road/Office Park Driveway	EB L	75	58	5	75	58	5
	EB T	---	405	653	---	473	708
	EB R	125	0	0	125	0	0
	WB L	200	30	88	200	33	98
	WB T/R	---	1055	68	---	1115	93
	NB L/T	---	1923	1428	---	1850	1103
	NB R	---	30	58	---	30	58
	SB L/T/R	---	5	93	---	5	93
Main Line Health Driveway/Raider Road & Radnor Chester Road	EB L	175	8	30	175	8	30
	EB T/R	---	13	43	---	13	43
	WB L	100	123	88	100	123	88
	WB T/R	---	0	5	---	0	5
	NB L	---	30	8	---	30	8
	NB T/R	---	938	148	---	938	148
	SB L	150	35	3	150	35	3
	SB T/R	---	20	28	---	20	28
King of Prussia Road & Radnor Plaza Driveway/Matsonford Road	EB L	100	503	75	100	503	75
	EB T/R	---	515	698	---	515	698
	WB L	115	13	10	115	13	10
	WB T	---	985	878	---	985	878
	WB R	285	0	0	285	0	0
	NB L	---	0	3	---	0	3
	NB T/R	---	3	8	---	3	8
	SB L	350	460	593	350	460	593
	SB T/R	---	50	100	---	50	100

TABLE 17 (CONT.)
95TH PERCENTILE QUEUE ANALYSIS

Intersection	Lane Group	2023 Base Conditions			2023 Projected Conditions		
		Existing Storage Length	95th Percentile Queue Length (ft)		Proposed Storage Length	95th Percentile Queue Length (ft)	
			A.M.	P.M.		A.M.	P.M.
Raider Road/Medical Office Driveway & King of Prussia Road	EB L/T/R	---	168	38	---	168	38
	WB L	115	125	268	115	125	268
	WB T/R	---	23	50	---	23	50
	NB L	250	65	13	250	65	13
	NB T	---	3303	195	---	3303	195
	NB R	---	240	45	---	240	45
	SB L	100	175	23	100	175	23
	SB T/R	---	450	2483	---	450	2483
King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway	EB L	TWTL[1]	0	0	TWCLTL[1]	0	0
	EB T	---	0	0	---	0	0
	EB R	90	0	0	90	0	0
	WB L	TWTL[1]	13	5	TWCLTL[1]	15	5
	WB T/R	---	0	0	---	0	0
	NB L/T	100	23	123	100	43	290
	NB R	---	5	23	---	5	23
	SB L/T/R	---	0	18	---	0	0
250 Office Loop Road & Radnor Chester Road	WB L/R	---	35	73	---	18	43
	NB T	---	0	0	---	0	0
	NB R	100	0	0	100	0	0
	SB L/T	---	15	3	---	5	0

[1]-Two-Way Center Left Turn Lane (existing)

As shown in **Table 17,** adequate storage for the existing/proposed queues will be provided for the turn lanes along King of Prussia and Radnor Chester Road at the access driveways during 2023 projected conditions assuming full occupancy and construction of the proposed parking structure. Queue analysis is included with the capacity analysis provided in **Appendix F**. It is also noted again that the trip generation should not exceed that associated with the prior full occupancy of the building by Penn Medicine at Radnor.

AUXILIARY TURN LANE ANALYSIS

Methodology

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

Findings

Table 18 summarizes the results of the auxiliary turn lane analysis at the site access intersections.

TABLE 18
AUXILIARY TURN LANE ANALYSIS SUMMARY

Intersection	Auxiliary Lane	Warrant Satisfied?	Required Lane Length	Existing Lane Length
King of Prussia Road & 250 Office Loop Road	WB Left-Turn Lane	Yes	100′	TWCLTL[1]
	EB Right-Turn Lane	Yes	100′	90′+25′ Taper
Radnor Chester Road & 250 Office Loop Road	SB Left-Turn Lane	No	--	--
	NB Right-Turn Lane	Yes	75′	100′

[1]-*Two-Way Center Left Turn Lane (existing)*

As can be seen in **Table 18**, all warranted auxiliary turn lanes are currently provided for along King of Prussia Road. The calculations for the auxiliary turn lane warrants are included in **Appendix H**.

GAP ANALYSIS

TPD performed a Gap Study at the King of Prussia Road & 250 Office Loop Road location. The number and duration of gaps available for these movements were documented. The duration of gaps in traffic directly relates to the capacity (number of vehicles) that can make the identified movements. In order for a vehicle to make the identified movements at these locations, a large enough gap in traffic must be present for those movements to occur. TPD determined the necessary Critical Gap and Follow-Up Gap needed for the evaluated movements based on HCM 2010 Methodology and the PA Default Value Adjustments. Based on this, the following peak hours and gaps were utilized:

Left-Turn from 250 Office Loop Road to King of Prussia Road:

- Weekday A.M. – 7:30-8:30 A.M. - Critical Gap of 6.5 seconds and Follow-Up Gap of 3.0 seconds
- Weekday P.M. – 4:00-5:00 P.M. - Critical Gap of 6.5 seconds and Follow-Up Gap of 3.0 seconds

The number and time duration of gaps counted during the A.M. and P.M. peak hours were compared to the standards outlined above, in order to determine the total number of vehicles that can be served during the peak hours.

Due to COVID, TPD adjusted the raw field gap counts to accurately reflect the adjustments that were made at the King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway existing manual turning movement counts that were performed on Thursday April 8, 2021. TPD compared the total capacity calculated based on the COVID adjusted field gap counts to the projected vehicle demand. **Table 19** shows this comparison.

TABLE 19
GAP ANALYSIS

Intersection	Movement	Peak Hour	COVID Adjusted Available Capacity for Vehicle Turns	Projected Vehicle Demand
King of Prussia Road & 250 Office Loop Road	Minor NB Left turn	Weekday A.M.	209	38
		Weekday P.M.	195	140

As shown in **Table 19**, the available capacity for exiting left-turn vehicles (gaps) at the 250 Office Loop Road entrance exceeds the anticipated number of egress vehicles. Therefore, based on the data presented there is sufficient capacity available for the site driveway to operate in an acceptable manner. Gap Study Data is included in **Appendix C**.

CONCLUSIONS

Based on the results of the transportation impact study, TPD offers the following conclusions:

- The project site is located on the southeastern corner of the intersection of King of Prussia Road (S.R. 1021) & Radnor Chester Road (SR-1021). The proposed project will consist of replacing surface parking with a parking structure which will add 156 additional parking spaces.
- Access to the site is currently via two (2) full-access driveways: one (1) to King of Prussia Road (S.R. 1021) located approximately 640 feet east of Radnor Chester Road (S.R. 1021), and one (1) to Radnor Chester Road (S.R. 1021) located approximately 485 feet south of King of Prussia Road (S.R. 1021). These access locations will remain unchanged. The internal circulation road which has five (5) full access points to the existing parking lot(s), is proposed to now have three (3) full access points from the parking structure.
- All existing driveway location sight distances will exceed PennDOT's Safe Stopping Sight Distance (SSSD) criteria.
- The existing office building located at 250 King of Prussia Road, will continue to operate as a General/Medical office building. The office building was recently fully occupied by Penn Medicine at Radnor which has relocated to a new facility on King of Prussia Road. It is expected the office building, at full occupancy, will generate approximately 349 trips during the weekday A.M. peak hour and 420 trips during the weekday P.M. peak hour.
- Under 2023 projected conditions with the redistribution of the 250 King of Prussia Road redevelopment trips with the proposed parking structure, the study area intersections will operate at the **same overall intersection level of service (ILOS) as under 2023 Base Conditions**, during the weekday A.M. and P.M. peak hours. The ILOS at the site driveway intersections will operate at **LOS D or better** under 2023 projected conditions during the weekday A.M. and P.M. peak hours.
- The existing office building does not have the required number of parking spaces and the parking structure is proposed to reduce the degree of the parking nonconformity as part of a building renovation that will not increase the floor area of the building. TPD understands that Penn Medicine at Radnor utilized valet parking which would indicate that the number of vehicles arriving at the site could not be accommodated in the available parking spaces.

FIGURES: 1-12

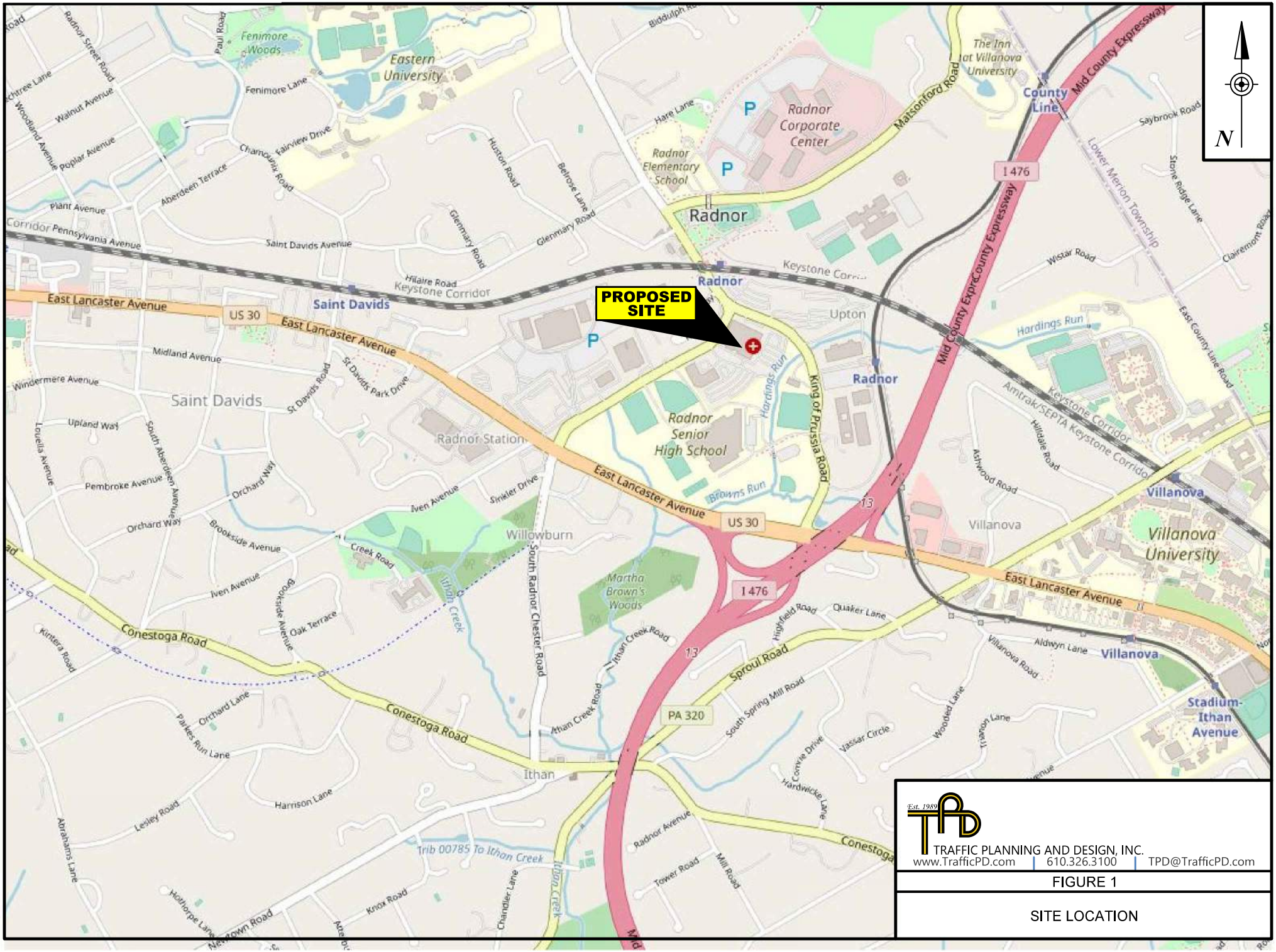

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FIGURE 1

SITE LOCATION

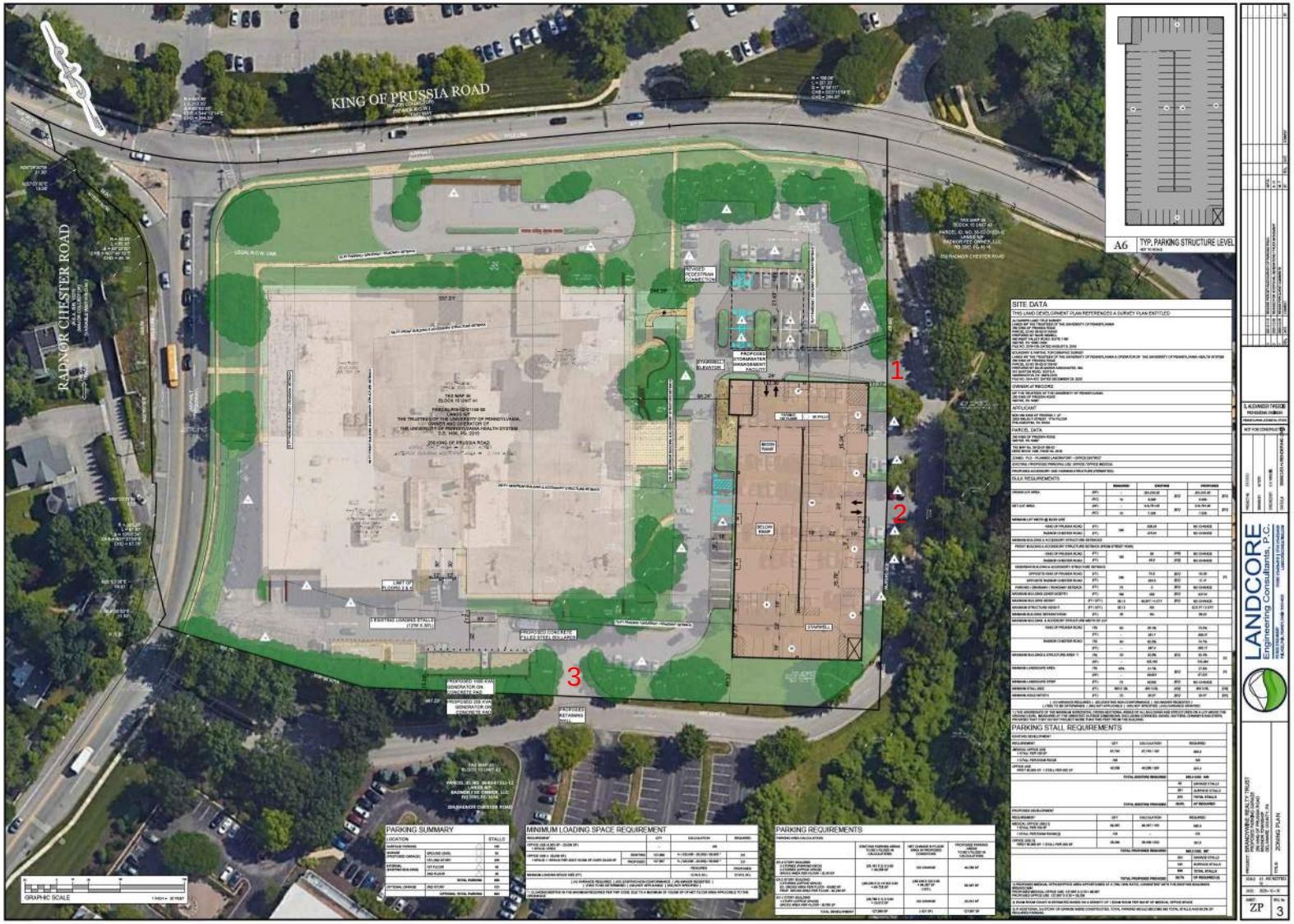

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FIGURE 2

SITE PLAN

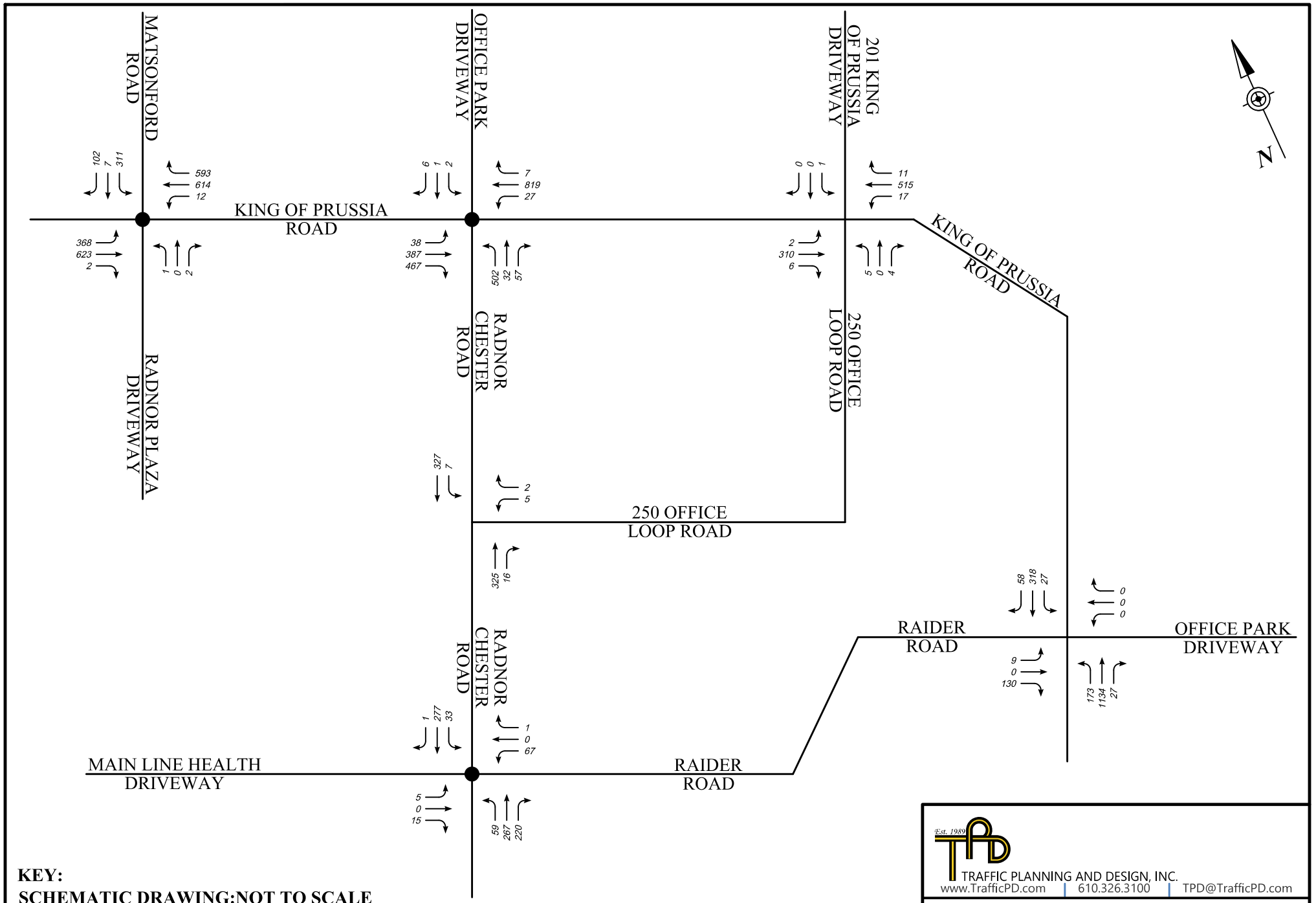

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FIGURE 3

EXISTING CONDITIONS (RAW DATA)
WEEKDAY AM PEAK HOUR
TRAFFIC VOLUMES

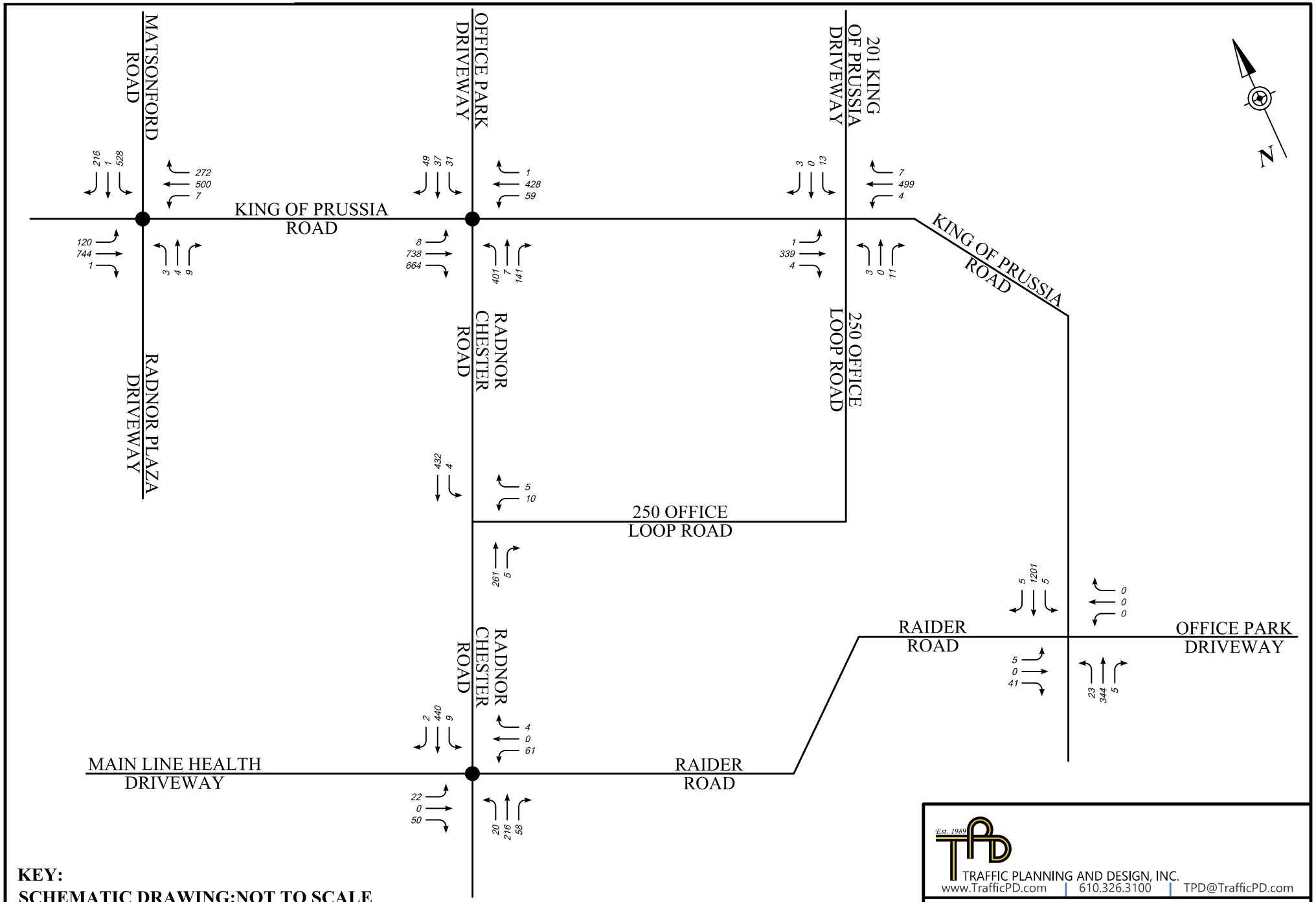

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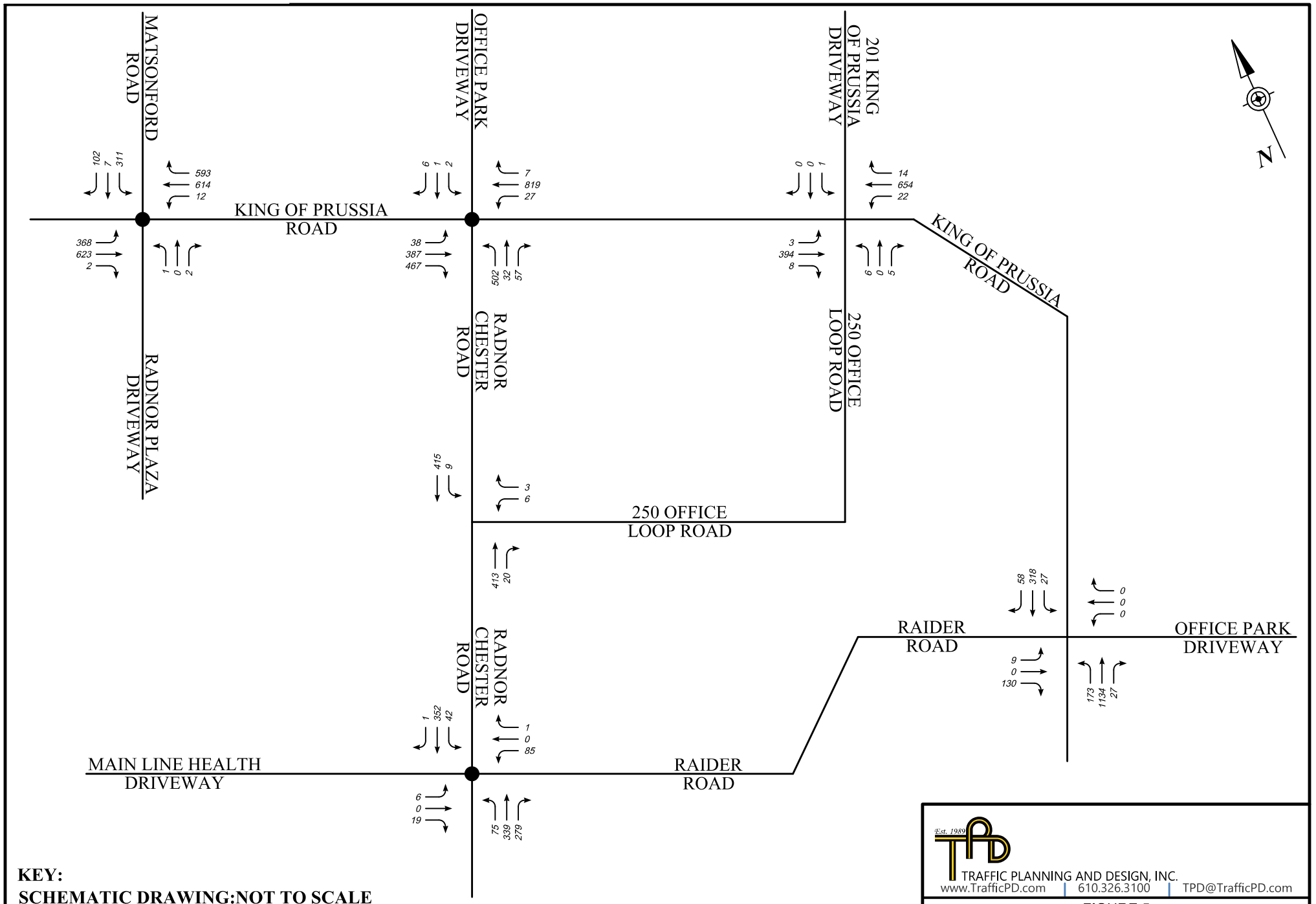
FIGURE 4

EXISTING CONDITIONS (RAW DATA)
WEEKDAY PM PEAK HOUR
TRAFFIC VOLUMES



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

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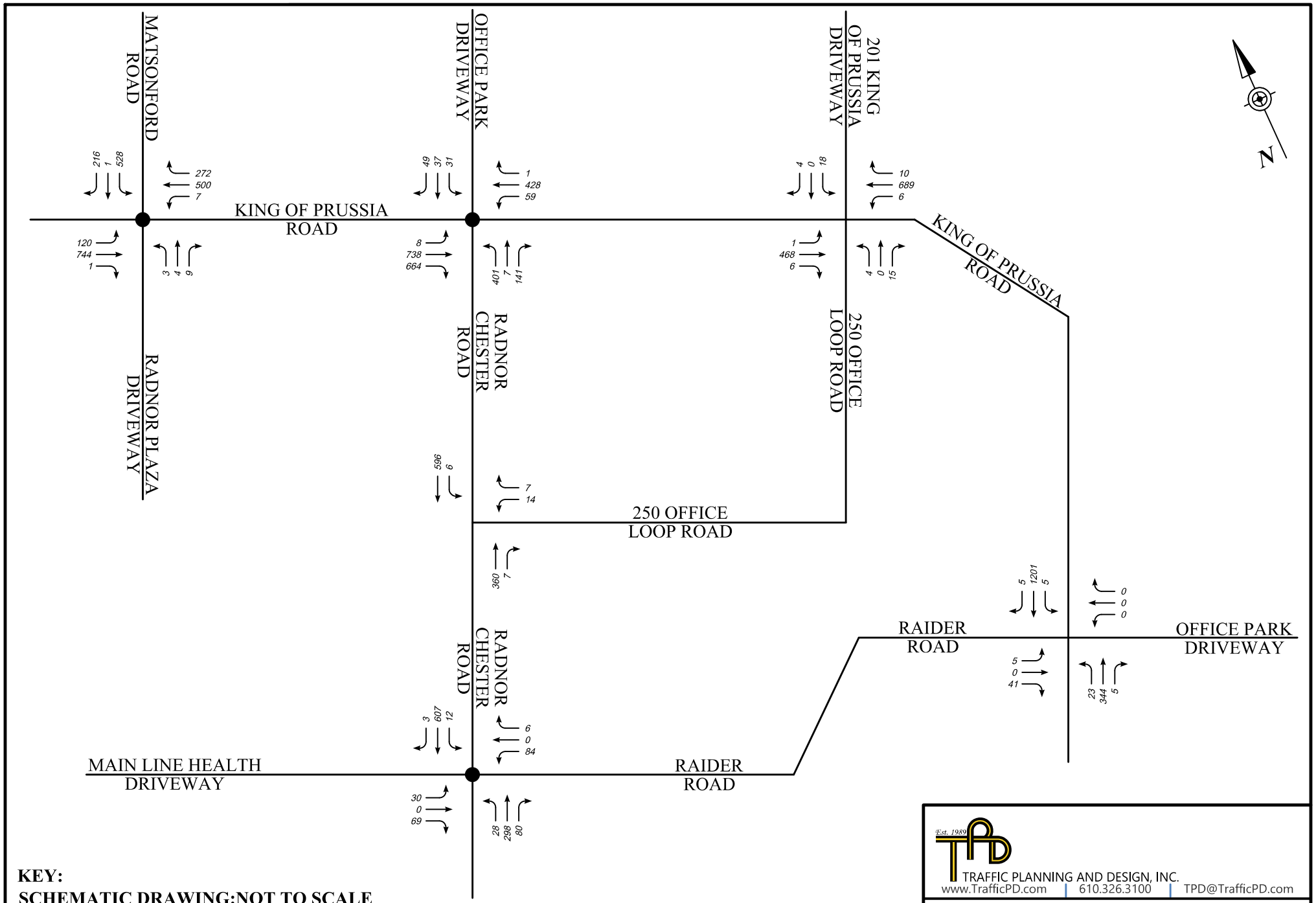
FIGURE 5

EXISTING CONDITIONS (COVID ADJUSTED)
WEEKDAY AM PEAK HOUR
TRAFFIC VOLUMES



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

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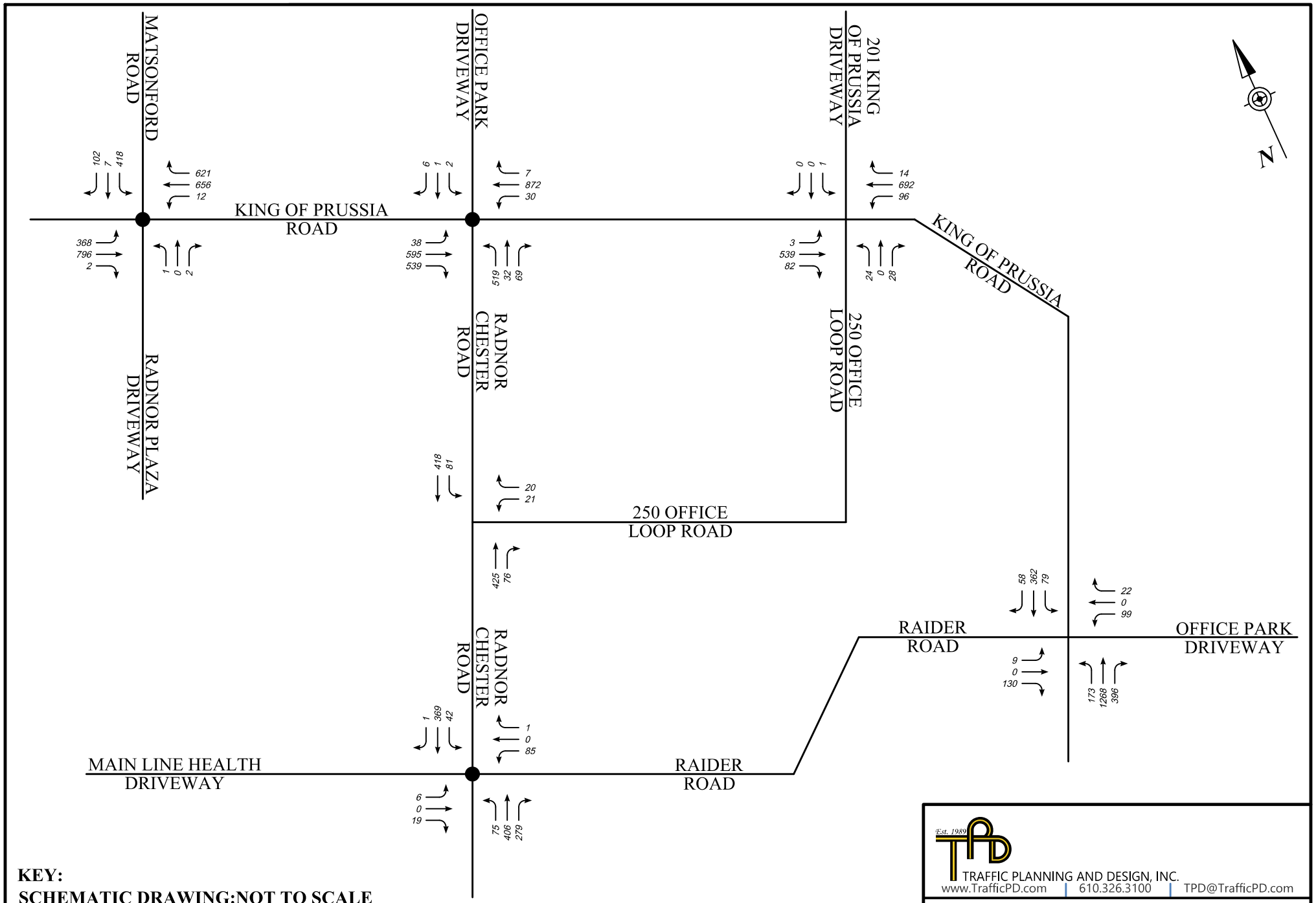
FIGURE 6

EXISTING CONDITIONS (COVID ADJUSTED)
WEEKDAY PM PEAK HOUR
TRAFFIC VOLUMES



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

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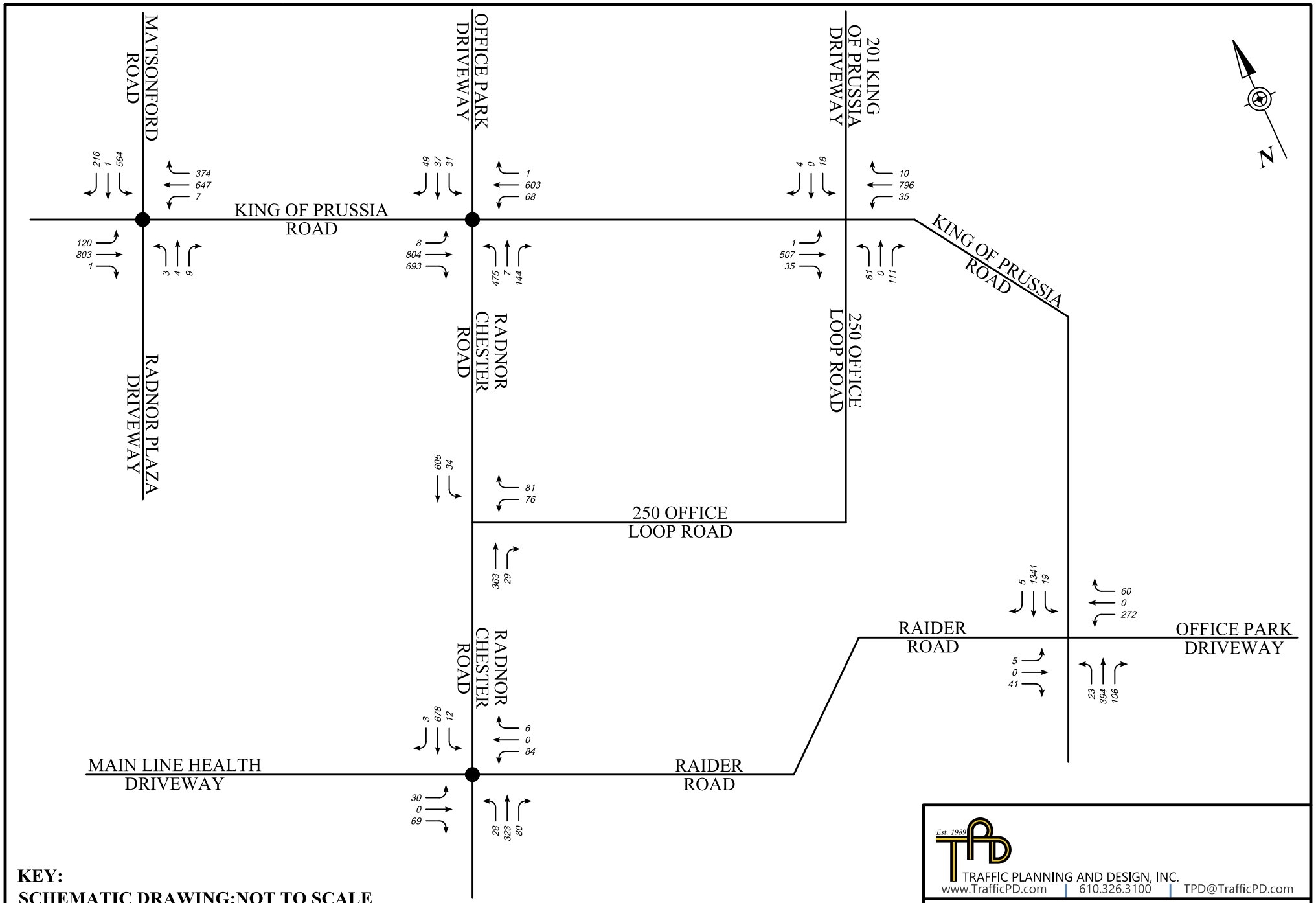
FIGURE 7

2023 BASE (NO-BUILD) CONDITIONS
WEEKDAY AM PEAK HOUR
TRAFFIC VOLUMES



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

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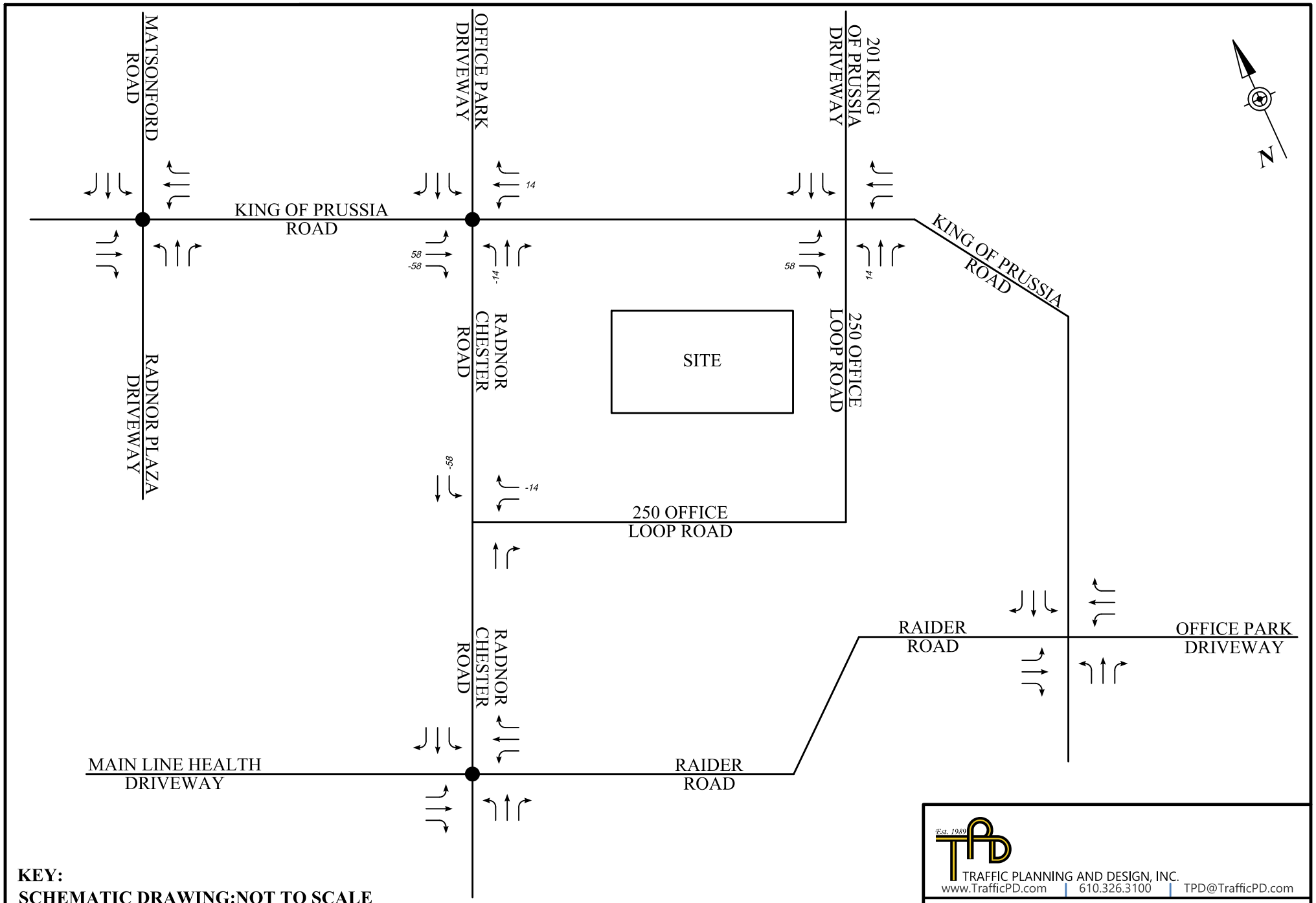
FIGURE 8

2023 BASE (NO-BUILD) CONDITIONS
WEEKDAY PM PEAK HOUR
TRAFFIC VOLUMES



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

Est. 1989
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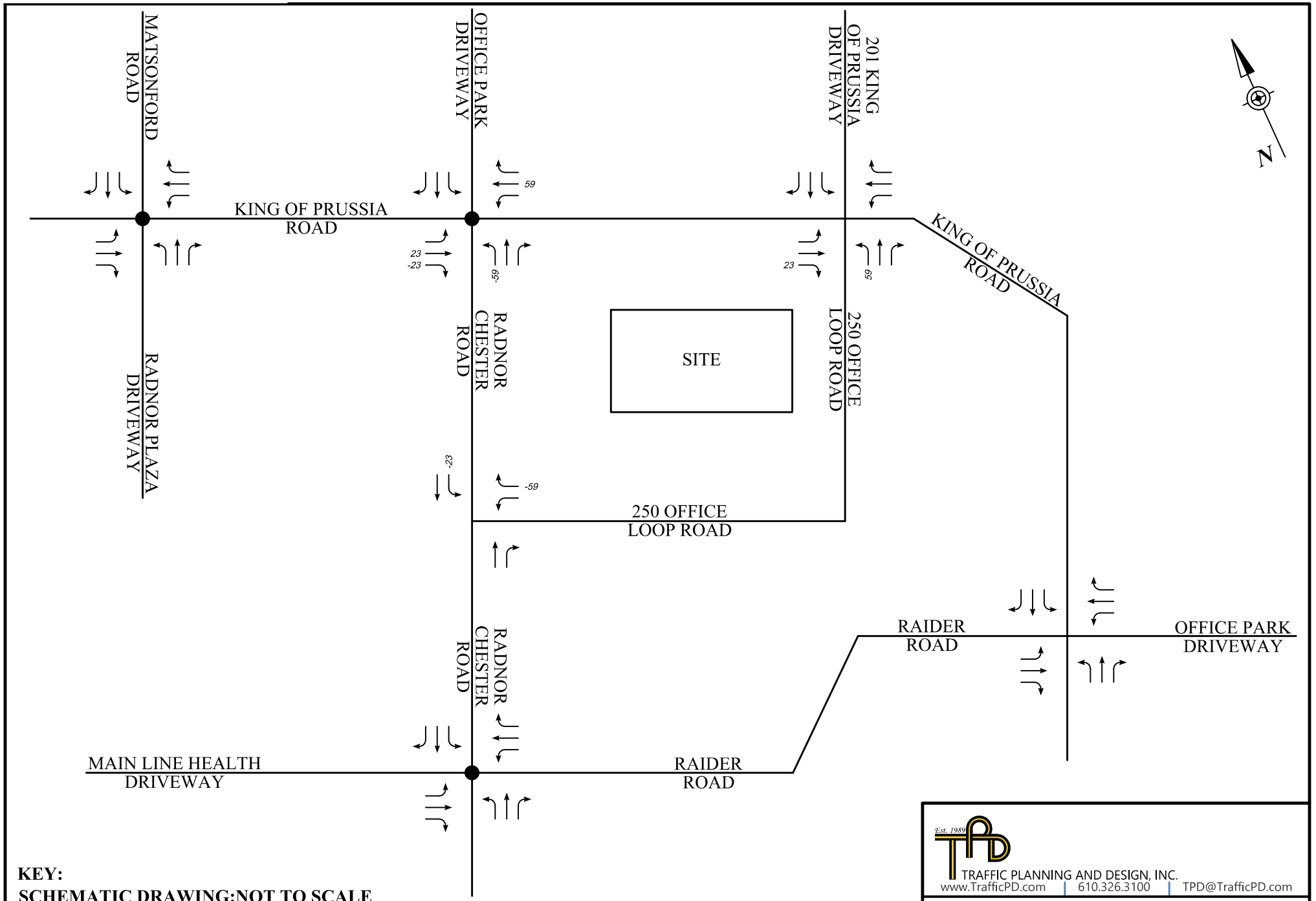
FIGURE 9

TRIP RE-DISTRIBUTION
WEEKDAY AM PEAK HOUR
VEHICULAR TRIPS



KEY:
SCHEMATIC DRAWING:NOT TO SCALE
STOP CONTROLLED
SIGNALIZED INTERSECTION

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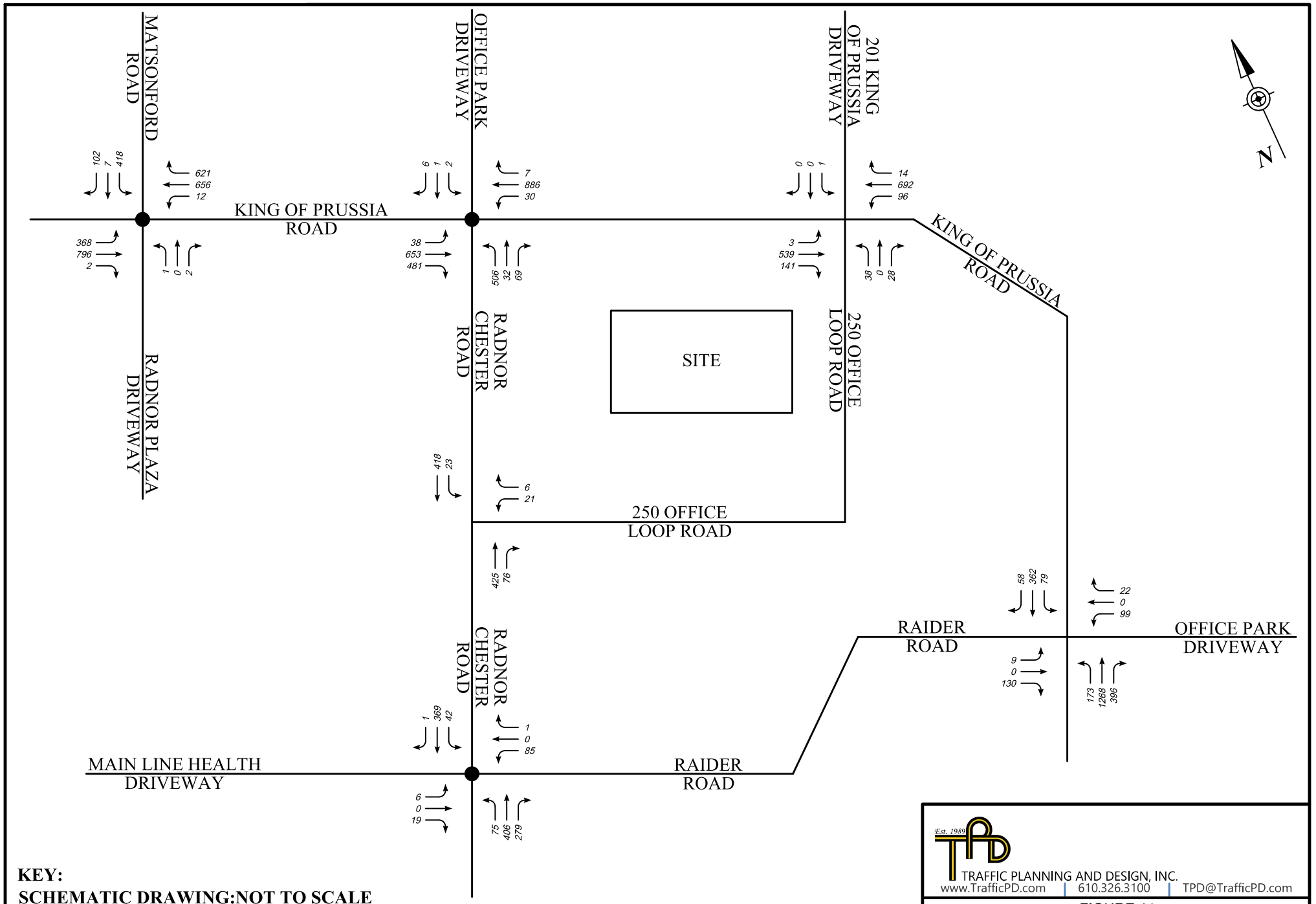
FIGURE 10

TRIP RE-DISTRIBUTION
WEEKDAY PM PEAK HOUR
VEHICULAR TRIPS



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

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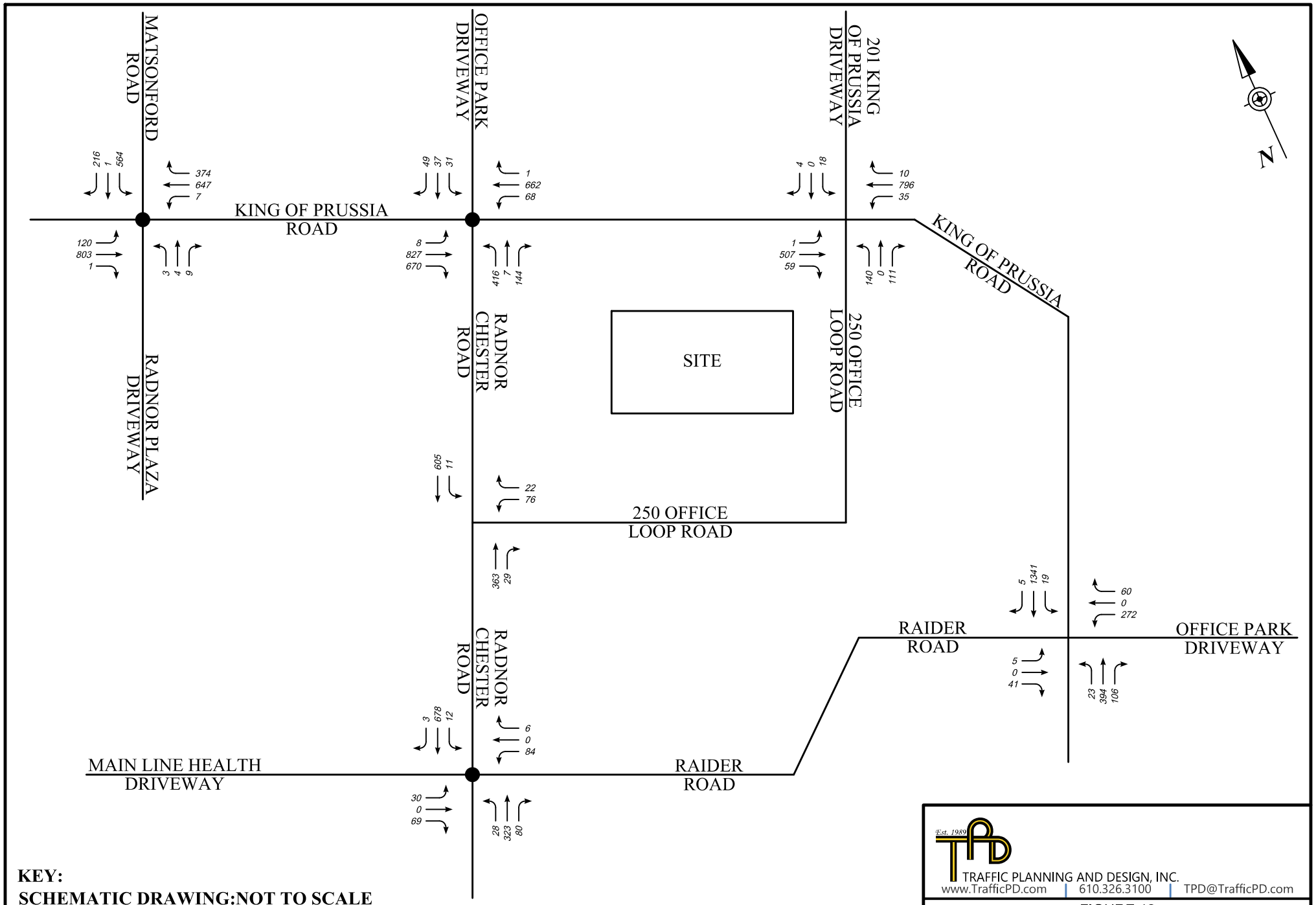
FIGURE 11

2023 PROJECTED (BUILD) CONDITIONS
WEEKDAY AM PEAK HOUR
TRAFFIC VOLUMES



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

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FIGURE 12

2023 PROJECTED (BUILD) CONDITIONS
WEEKDAY PM PEAK HOUR
TRAFFIC VOLUMES

Appendix A

Project Correspondence

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

MEMORANDUM

Date: March 23, 2021

To: Steve Norcini, P.E.
Radnor Township Engineer

From: Damon Drummond, P.E., PTOE
Senior Transportation Engineer

cc: Kevin Kochanski, ASLA, R.L.A. – Director of Community Development
Roger Phillips, P.E. – Gannett Fleming, Inc.
Leslie Salsbury, P.E. – Gilmore and Associates, Inc.

Reference: 250 King of Prussia Road Proposed Parking Structure
Preliminary/Final Land Development Plan Review #1
Radnor Township, Delaware County, PA
G&A #21-03007

Gilmore & Associates, Inc. (G&A) has completed a transportation review for the referenced project and offers the following transportation comments for Radnor Township consideration:

A. BACKGROUND

The applicant proposes to demolish a portion of the existing parking lot and construct a minimum 2-story parking garage for the office building at 250 King of Prussia Road.

B. DOCUMENTS REVIEWED

1. Preliminary/Final Land Development Plan prepared by Landcore Engineering Consultants, P.C., consisting of 10 sheets and dated February 18, 2021.
2. Subdivision and Land Development Application.
3. 250 King of Prussia Road submission letter, prepare by Landcore Engineering dated February 19, 2021.

C. REQUESTED WAIVERS

1. §255-21.B(4)(D) – The Applicant is requesting a waiver from providing a landscape plan.
2. §255-29.A(1) – The Applicant is requesting a waiver to permit 9’ x 19’ parking stalls where 9.5’ x 20’ are required.

65 E. Butler Avenue | Suite 100 | New Britain, PA 18901 | **215-345-4330** | 215-345-8606
508 Corporate Drive West | Langhorne, PA 19047 | **215-369-3955** | 215-345-8606
184 W. Main Street | Suite 300 | Trappe, PA 19426 |**610-489-4949** | 610-489-8447
119 East Linden Street | Kennett Square, PA 19348 | **610-444-9006** | 610-444-7292
5100 Tilghman Street | Suite 150 | Allentown, PA 18104 | **610-366-8064** | 610-366-0433
One Penn Center at Suburban Station | 1617 JFK Blvd. | Suite 425 | Philadelphia, PA 19103 | **215-687-4246** | 215-564-1780
201 Market Street | Camden, NJ 08102 | **856-203-7447** | 856-379-3567
www.gilmore-assoc.com

3. §255-29.B – The Applicant is requesting a waiver of the parking lot landscape requirements.
4. §255-43.1 – The Applicant is requesting a waiver of the park and recreation land/fee requirements.
5. §263-8.C(3) – The Applicant is requesting a waiver to permit a fee in lieu of replacement plantings.

D. SUBDIVISION AND LAND DEVELOPMENT ORDINANCE COMMENTS

1. §250-17.D(7) – A clear sight triangle of 50 feet must be provided for all driveways, measured from the point of intersection of the street right-of-way line and edge of the driveway. This includes the proposed accesses to the parking structure as well as the existing driveways that lead to the new access points. The site plan shall contain a notation that states that the applicant is required to maintain the area of the clear sight triangle and the Township has the right to enter and perform required maintenance in the area if deemed critical to public welfare. Revise the plans to label the clear sight triangles and ensure that no plantings are proposed within this area.
2. §255-12.A – Separate preliminary and final land development approvals are required to enable the Planning Commission and the Board of Commissioners to have adequate opportunity to review the submission.
3. §255-20.B(1)(f) & §255-22.(1)(k) – The Applicant should show man made features within 500 feet of the site.
4. §255-20.B(5) – A transportation impact study shall be undertaken for all major subdivisions and developments as defined in section B(5)(c).The traffic study should include the following:
    a. Study area intersections:
        - Radnor Chester Road/King of Prussia Road
        - Raider Road/Radnor Chester Road
        - Matsonford Road/King of Prussia Road
        - Raider Road/King of Prussia Road
        - Access/King of Prussia Road
        - Access/Radnor Chester Road
    b. Address any trip generation difference with the applicant's use from the previous Penn Medicine facility use. Address if any new trips are anticipated which are triggering the need for the additional proposed parking garage.
    c. With the proposed parking garage, determine any modifications to traffic distribution at the driveway access.
    d. Evaluate the internal circulation. We have concerns with potential conflicts between vehicles exiting the parking garage and vehicles

maneuvering into/out of the surface lot spaces on the east side of the parking structure. Consideration should be given to eliminating the two exit-only accesses while maintaining the one central two-way access driveway. This would increase the number of parking spaces within the garage on the ground level. Consideration should also be given to removing the two parking spaces on the surface lot closest to the two-way access driveway as maneuvering out of those spaces may require a vehicle to back into the access driveway with limited sight distance.

5. §255-29.A(1) – Provide the minimum dimensions for a parking space for 90 degree parking (9 ½' x 20'). **The applicant is requesting a waiver of this requirement to allow them to provide 9' x 19' spaces.**
6. §255-29.A(14) – Label the curb radii to ensure a minimum 5' radius is provided in the parking areas.
7. §255-29.A(15) – Provide vehicle turning templates to ensure vehicles can maneuver into/from the parking spaces at the dead-end parking area. Also, provide a template showing a vehicle is able to turn around within the dead-end area if no parking spaces are available.
8. §255-37.B – Label the width of the sidewalk on the plans.
9. §255-37.D – Provide details of any proposed curb ramps (grades, slopes, lengths, etc.) to ensure compliance with current ADA requirements.

E. GENERAL COMMENTS

1. Provide "Pedestrian" signs (W11-2) on the approaches to the crosshatched area between the parking garage and the building. Include sign details on the plans.
2. Show the location of the "Reserved Parking" signs (detail D7) on the plans.
3. The plans show an existing stop bar on the southbound approach to the crosshatched area in front of the building. Confirm if a stop sign is provided for this approach. If so, consider providing similar traffic control for the northbound approach
4. Provide a plan that clearly shows all parking on the ground level floor and the second floor of the parking garage.
5. Note 3 on the Parking Stall Requirements table (Sheet 2 of 10) indicates the number of parking spaces that would be provided if an additional third story of the garage were constructed. The note further states that this would only account for 66.2% of the required parking spaces. Confirm the number of stories that will be provided for the proposed parking structure. Since the proposed construction will not meet the requirement either way, a waiver will be needed. Provide justification in the waiver request as to the number of stories proposed. Also, provide a parking layout for each level with a corresponding vehicle turning template to confirm maneuverability within the structure.
6. Clearly indicate the number of handicap parking spaces required per the overall parking spaces to be provided. The noted existing handicap spots west and south of the building do not meet current handicap parking standards as no

accessible aisles are provided. The parking should be updated to provide the appropriate number accessible parking space per current requirements. Existing handicap parking spaces without accessible aisles should not be counted towards the total.

7. In accordance with PROWAG (Public Rights-of-Way Accessibility Guidelines), section R302.4, where the clear width of pedestrian access routes is less than 5', passing spaces shall be provided at intervals of 200' maximum. Passing areas shall be 5' by 5' minimum. The existing sidewalk along the site frontage is 4' wide. The plans should be revised to provide passing areas along the site frontage.
8. Update the construction notes to indicate how construction vehicles will access the site (either via the existing Radnor Chester Road access or the King of Prussia Road access). Provide vehicle turning templates for construction vehicles accessing the existing site driveway that will be used during construction. Include notes regarding the installation of appropriate signage restricting construction vehicles to certain entrances, if required.

DAD/kmn

Gannett Fleming

*Excellence Delivered **As Promised***

Date: March 29, 2021

To: Steve Norcini, PE Township Engineer

From: Roger Phillips, PE

cc: Kevin W. Kochanski, RLA, CZO – Director of Community Development
Mary Eberle, Esq. – Grim, Biehn, and Thatcher
Damon Drummond, PE – Gilmore & Associates, Inc.
Patricia Sherwin – Radnor Township Engineering Department

RE: 250 King of Prussia Road

Date Accepted: 03/01/2021
90 Day Review: 05/30/2021

Gannett Fleming, Inc. has completed a review of the Preliminary/Final Land Development Plan for the above reference project for compliance with the Radnor Township Code. The Plans were reviewed for conformance with Subdivision and Land Development, Zoning and other applicable codes of the Township of Radnor.

The applicant is proposing to construct a parking structure over an existing surface parking lot at the above location. This property is located within the PLO district of the Township.

The applicant appeared before the Zoning Hearing Board March 18, 2021. The applicant has requested variances to the following:

1. §280-64.C– To permit (i) a setback of 43.38 feet (+/-) opposite King of Prussia Road and (ii) a setback of 17.17 feet (+/-) opposite Radnor Chester Road;
2. §280-64.B – To allow a building/structure area of 42.4% (+/-)
3. §280-64.B – To allow a landscaped area of 27.8%
4. Any other relief deemed necessary for the project.

The applicant has indicated on the plans that the following waivers are being requested:

1. §255-21-B(4)(D) – To waive requirement for submission of a landscape plan.
2. §255-29-A(1) – To permit 9x19 parking spaces where 9.5 x 20 are required.
3. §255-29-B – To waiver parking lot landscape requirements.
4. §255-43-1 – To waive park and recreation land/fee requirements.
5. §263-8-C(3) – To permit a fee in lieu for replacement plantings.

BDN 250 King of Prussia I, LP – Proposed Parking Structure
Plans Prepared By: Landcore Engineering Consultants, P.C.
Dated: 02/18/2021

Zoning

1. §280-63.A – 40 to 100% of the gross floor area may be used or occupied for (1) Scientific or industrial research (2) office building, including medical, dental, professional and sales. The applicant has indicated on the plans that the proposed medical office use will be 70% and the proposed office use will be 30%.

2. §280-63.D(5) – A parking structure, when constructed as an accessory structure for the purpose of eliminating allowable surface parking is allowed. Parking spaces within structures may be reduced to no less that nine feet in width by 19 feet in depth, exclusive of aisles. The applicant has dimensioned the spaces to the 9 x 19 of the plans.

3. §280-64.A– Every lot on which a building or a combination of buildings is hereafter erected or used shall have a lot area of not less than 10 acres, and such lot shall not be less than 300 feet at the building line. This is a existing non-conformity that the applicant wishes to continue.

4. §280-64.B – No more than 30% of the area of any lot may be occupied by building and structures, and not less than 45% of the total lot area, exclusive of those areas withing the public right-of-way, shall be devoted to land landscaping. The applicant is requesting a variance to allow a building/structure area of 42.4% (+/-). The existing facility is currently 32.5%

5. §280-64.B – No more than 30% of the area of any lot may be occupied by building and structures, and not less than 45% of the total lot area, exclusive of those areas withing the public right-of-way, shall be devoted to landscaping. The applicant is requesting a variance to allow a landscaped area of 27.8%. The existing landscaped area is 31.7%.

6. §280-64.C– No building or accessory structure shall be located less than 150 feet from, a street right-of-way line nor less than 200 feet from a side or rear property line and n surface parking area, driveway, service or interior roadway with the exception of approved areas for vehicular access, shall be located less than 75 feet from a street right-of-way or other property line. The applicant has requested a variance to permit (i) a setback of 43.38 feet (+/-) opposite King of Prussia Road and (ii) a setback of 17.17 feet (+/-) opposite Radnor Chester Road. The existing setbacks are (i)74.5 and (ii)233.6 feet.

7. §280-64.G(4)– A parking garage or parking structure may have a height of up to 55 feet so long as such parking garage or parking structure does not exceed the height of any building on the site. The plans indicate a 3rd story of parking could be constructed. The applicant must indicate the height of the parking garage if the 2nd floor was constructed and also if the 3rd floor was constructed.

8. §280-65.1– Along each street line, a landscaped strip not less than 75 feet in width shall be provided, except for necessary sidewalks and accessways crossing the strip. This is an existing non-conformity that the applicant wishes to continue.

Subdivision and Land Development

1. §255-12.A – The applicant has submitted this plan as a Preliminary/Final Land Development plan. A waiver must be requested to permit the land development application to proceed and be reviewed as a single preliminary/final land development plan.

2. §255-20.B(1)(n) – Existing principal buildings (and their respective uses) and driveways on the adjacent peripheral strip. Sewer lines, storm drains, culverts, bridges, utility easements, quarries, railroads and other significant man-made features within 500 feet of and within the site (this includes properties across streets) must be shown on the plans A waiver must be requested from this requirement.

3. §255-20.B(5)(a) – A transportation impact study shall be undertaken for all major subdivisions and land developments.

4. §255-21-B(4)(D) – Landscaping and grading plans must be provided. The applicant has required a waiver from submitting a landscape plan.

5. §255-29-A(1) – Parking stalls with 90° angled parking must be 9.5’ x 20’. The applicant has requested a waiver to permit 9’ x19’ parking spaces where 9.5’ x 20’ are required.

6. §255-29-A(1) – The two-way aisle width with 90° parking spaces shall be 22 feet. The applicant has indicated that there will be a 21.43’ aisle width between the existing parking and area the proposed parking spaces to the North of the garage. The applicant must request a waiver for proposed aisle width of 21.43’.

7. §255-29-A(6) – No more than 10 parking spaces shall be permitted in a continuous row without being interrupted by landscaping and concrete curb. There are proposed parking spaces that have more than 10 parking spaces in a row. A waiver must be required from this requirement.

8. §255-29-A(14) – No less than a five-foot radius of curvature shall be permitted for all curb lines in parking areas. This must be shown on the drawings.

9. §255-29-A(18) – All common parking areas shall be adequately lighted after-dark operation hours. All lighting standards shall be located on raised parking islands and not on the parking surfaces.

10. §255-29-B – All parking areas shall have at least one tree 2 ½ inches minimum in caliper for every five parking spaces in single bays and one tree 2 ½ inches in caliper for every 10 parking spaces in double bays. The applicant has required a waiver from this requirement.

11. §255-38B – Street trees 2 ½ inches dbh at intervals of not more than 30 feet along both sides of new streets and along one or both sides of an existing street within the proposed subdivision or land development must be shown on the plans. Street trees must be provided or a waiver requested.

12. §255-43.1.B(2) – For all nonresidential or institutional subdivisions and/or land developments involving more than 5,000 square feet of floor area, the amount of land to be dedicated for park and recreational area shall be 2,500 square feet per 6,400 square feet of floor area (existing or proposed), or portion thereof, unless the developer agrees to a fee in lieu of $3,307 per 6,400 square feet of floor area(existing or proposed). The applicant has requested a waiver from this requirement.

Stormwater

1. §245-13.B(22) – Please revise the plans to include a statement, signed by the applicant, acknowledging that any revision to the approved drainage plan must be approved by the municipality, and that a revised erosion and sediment control plan must be submitted to the Conservation District for a determination of adequacy.

2. §245-13.B(23) – Please revise the plans to include the following signature block for the design engineer:

   "I, (Design Engineer), on this date (date of signature), hereby certify that the drainage plan meets all design standards and criteria of the Radnor Township Stormwater Management Ordinance."

3. §245-13.B(24) – Please revise the plans to include a statement indicating what the applicant has done to minimize impervious materials on site.

4. §245-13.C(1)(d) – Please provide the expected project time schedule.

5. §245-22.A.(2)(c)[2] - If the minimum of 0.50 inch of infiltration requirement cannot be achieved, a waiver from §245-22, Ground water recharge, would be required from the municipality. The percolation report indicates infiltration rates of 0 in/hr. To move forward with a waiver request, you will need to submit a letter to the Township formally requesting waivers from the sections of the Ordinance you cannot meet. The letter should be sent to the Township Engineer, Steve Norcini (snorcini@radnor.org). Once the waiver request letter is received, you will be contacted to advise you as to when the request will be placed on an agenda for a Board of Commissioners meeting. Ultimately, they would be deciding as to whether a waiver would be approved or not.

6. §245-27.J - Underground stormwater management systems must be designed to store the two- through one-hundred-year storms within a pipe or other open system that will permit the inspection and maintenance of the system. The entire storm must be placed in the pipe (i.e., the stone bedding around the pipe is not to be included in the volume calculations). It appears the proposed stormwater management system does not adequately provide for the §245-23 Water Quality volume. Please revise the system to accommodate the required volumes within the pipe, as measured from the invert of the storage pipe to the invert of the lowest orifice. It would be helpful to show how the 48" pipe connects to the rest of the system.

7. §245-32 – Please provide an operation and maintenance plan in accordance with this section of the code.

8. Sheet 6 – Grading & Drainage Plan – Please revise this plan to identify the structure connected to the 76 LF 12" HDPE pipe and include all necessary elevation and dimensional information.

9. Sheet 8 – Construction Details – The Outlet Structure No. ST-01 detail indicates a 30" HDPE invert elevation of 93.00, but the elevations on site are generally above 350.00. Please revise the invert accordingly.
10. Sheet 8 – Construction Details – Please revise the Underground Detention Basin w/ Impermeable Liner detail to indicate the invert of the 48" HDPE pipe.

11. Sheet 8 – Construction Details – There are some dimensions within the Underground Detention Basin w/ Impermeable Liner detail that are labeled as "XX" but do not appear to correspond to any numerical values. Please revise these to indicate the site-specific dimensions of this proposed stormwater management system.

12. Sheet 9 – Profiles & Construction Details – Please revise the Storm Sewer Profile to include all crossing utilities.

13. Please revise the Existing Conditions Drainage Area Map in the stormwater report to indicate the "Within LOD" drainage area and "Non-LOD" drainage area.

14. Please revise the plan set to provide a plan view detail of the proposed stormwater management system.

15. Please revise the plan set to indicate how the ST-02 manhole connects to the UG-01 stormwater management system.

16. The hydrograph report indicates a length of 90' for the 48" pipe but the plan set indicates an overall bed length of the stormwater management system as 90', which would not appear to allow appropriate space for the required stone width or any structures on either end of the pipe. Please clarify, or revise the stormwater system to provide the necessary spacing and to be consistent with the hydrographs.

17. The Storm Sewer Tabulation in the stormwater report indicates the slope of the pipe between ST-07 and ST-06 as 0.62% but the Grading and Drainage plan on Sheet 6 and the Storm Sewer Profile on Sheet 9 of the plan set indicates this slope as 0.50%. Please revise this inconsistency.

18. Page 4 and 5 of the stormwater report include section numbers that do not match the Radnor Township ordinance. Please revise accordingly.

19. Final approval of the stormwater management plan will be required as part of the Grading Permit process. Any revisions to the size or location of the individual structures or other features will be addressed at this time.

General

1. §263-8-C(3) – The Shade Tree Commission shall approve or disapprove each heritage tree permit application in accordance with this chapter. If the removal of a heritage tree is approved, the applicant shall replace each heritage tree DHB for DHB, unless such replacement planting on site is impractical or impossible, in which event the applicant shall contribute a fee in lieu of such planting to the Commemorative Shade Tree Fund or shall plan the required trees in locations in need in the Township. The applicant has requested to permit a fee in lieu for replacement plantings.

2. The applicant must appear before the Shade Tree Commission and gain approval prior to this plan being presented to the Board or Commissioners.

3. Detailed parking structure plans must be provided for review.

If you have any questions or require any additional information, please contact me.

Very truly yours,

GANNETT FLEMING, INC.

Roger A. Phillips, P.E.
Senior Project Manager

Appendix B

Study Area Photographs

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Radnor Chester Road/Office Park Driveway

Direction / Road: EB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: EB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Radnor Chester Road/Office Park Driveway

Direction / Road: WB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: WB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Radnor Chester Road/Office Park Driveway

Direction / Road: NB Radnor Chester Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: NB Radnor Chester Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Radnor Chester Road/Office Park Driveway

Direction / Road: SB Office Park Driveway
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: SB Office Park Driveway
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* Radnor Chester Road & Raider Road

Direction / Road: EB Main Line Health Office Driveway
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: EB Main Line Health Office Driveway
Approach / Departure: Approach
Distance: 150 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* Radnor Chester Road & Raider Road

Direction / Road: WB Raider Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: WB Raider Road
Approach / Departure: Approach
Distance: 150 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* Radnor Chester Road & Raider Road

Direction / Road: NB Radnor Chester Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: NB Radnor Chester Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* Radnor Chester Road & Raider Road

Direction / Road: SB Radnor Chester Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: SB Radnor Chester Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Matsonford Road/Radnor Plaza Driveway

Direction / Road: EB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: EB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: *BRS.00010* *Date Taken:* *4-7-2021* *Intersection Of:* *King of Prussia Road & Matsonford Road/Radnor Plaza Driveway*

Direction / Road: WB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: WB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: *BRS.00010* *Date Taken:* *4-7-2021* *Intersection Of:* *King of Prussia Road & Matsonford Road/Radnor Plaza Driveway*

Direction / Road: NB Radnor Plaza Driveway
Approach / Departure: Approach
Distance: 50 feet

Direction / Road:
Approach / Departure:
Distance:

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Matsonford Road/Radnor Plaza Driveway

Direction / Road: SB Matsonford Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: SB Matsonford Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Raider Road/Medical Office Driveway

Direction / Road: EB Raider Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: EB Raider Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: *BRS.00010* *Date Taken:* *4-7-2021* *Intersection Of:* *King of Prussia Road & Raider Road/Medical Office Driveway*

Direction / Road: WB Medical Office Driveway
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: WB Medical Office Driveway
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Raider Road/Medical Office Driveway

Direction / Road: NB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: NB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & Raider Road/Medical Office Driveway

Direction / Road: SB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: SB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Direction / Road: EB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: EB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Direction / Road: WB King of Prussia Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: WB King of Prussia Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Direction / Road: NB 250 Office Loop Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: NB 250 Office Loop Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Direction / Road: SB 201 King of Prussia Driveway
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: SB 201 King of Prussia Driveway
Approach / Departure: Approach
Distance: 250 Feet

Job #: *BRS.00010* *Date Taken:* *4-7-2021* *Intersection Of:* *Radnor Chester Road & 250 Office Loop Road*

Direction / Road: WB 250 Office Loop Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: WB 250 Office Loop Road
Approach / Departure: Approach
Distance: 150 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* Radnor Chester Road & 250 Office Loop Road

Direction / Road: NB Radnor Chester Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: NB Raider Road
Approach / Departure: Approach
Distance: 250 Feet

Job #: BRS.00010 *Date Taken:* 4-7-2021 *Intersection Of:* Radnor Chester Road & 250 Office Loop Road

Direction / Road: SB Radnor Chester Road
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: SB Radnor Chester Road
Approach / Departure: Approach
Distance: 250 Feet

Appendix C

Manual Traffic Count Printouts & Gap Study Data

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

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Raider Road
Site Code:
Start Date: 04/08/2021

Turning Movement Data

Start Time	Office Drive Eastbound						Raider Road Westbound						Radnor Chester Road Northbound						Radnor Chester Road 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	
7:00 AM	1	0	0	0	0	1	0	0	1	0	0	1	5	23	6	0	0	34	0	24	0	0	0	24	60
7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	19	26	8	0	0	53	0	39	2	0	0	41	94
7:30 AM	0	0	0	1	0	1	2	0	0	0	0	2	14	39	5	0	0	58	1	50	1	0	0	52	113
7:45 AM	0	0	0	2	0	2	5	1	0	0	1	6	15	58	21	0	1	94	1	55	1	0	0	57	159
Hourly Total	1	0	0	3	1	4	7	1	1	0	1	9	53	146	40	0	1	239	2	168	4	0	0	174	426
8:00 AM	1	0	1	1	1	3	12	0	1	0	1	13	16	62	56	1	2	135	9	62	1	0	0	72	223
8:15 AM	1	0	0	3	1	4	30	0	0	0	2	30	21	70	131	7	5	229	17	71	0	0	0	88	351
8:30 AM	2	0	4	3	0	9	22	0	0	0	1	22	14	55	22	0	1	91	6	62	0	0	0	68	190
8:45 AM	1	0	0	3	0	4	3	0	0	0	0	3	8	80	3	0	0	91	1	82	0	0	0	83	181
Hourly Total	5	0	5	10	2	20	67	0	1	0	4	68	59	267	212	8	8	546	33	277	1	0	0	311	945
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	4	0	10	8	0	22	7	0	0	0	5	7	10	75	8	0	7	93	1	107	0	0	0	108	230
4:15 PM	4	0	8	6	4	18	7	0	0	1	3	8	10	64	9	0	1	83	2	115	0	0	0	117	226
4:30 PM	3	0	8	10	0	21	16	0	2	0	6	18	8	51	12	0	7	71	4	93	1	0	0	98	208
4:45 PM	2	0	8	10	0	20	7	0	0	0	1	7	10	48	13	1	0	72	1	108	0	0	0	109	208
Hourly Total	13	0	34	34	4	81	37	0	2	1	15	40	38	238	42	1	15	319	8	423	1	0	0	432	872
5:00 PM	10	0	10	8	0	28	16	0	0	0	0	16	7	59	15	4	0	85	2	88	0	0	0	90	219
5:15 PM	5	0	4	6	0	15	19	0	2	0	0	21	6	44	16	2	0	68	1	113	0	0	0	114	218
5:30 PM	4	0	5	5	1	14	9	0	0	0	1	9	4	61	13	1	1	79	3	130	0	1	0	134	236
5:45 PM	3	0	4	8	2	15	17	0	2	0	0	19	3	52	5	2	0	62	3	109	1	0	0	113	209
Hourly Total	22	0	23	27	3	72	61	0	4	0	1	65	20	216	49	9	1	294	9	440	1	1	0	451	882
Grand Total	41	0	62	74	10	177	172	1	8	1	21	182	170	867	343	18	25	1398	52	1308	7	1	0	1368	3125
Approach %	23.2	0.0	35.0	41.8	-	-	94.5	0.5	4.4	0.5	-	-	12.2	62.0	24.5	1.3	-	-	3.8	95.6	0.5	0.1	-	-	-
Total %	1.3	0.0	2.0	2.4	-	5.7	5.5	0.0	0.3	0.0	-	5.8	5.4	27.7	11.0	0.6	-	44.7	1.7	41.9	0.2	0.0	-	43.8	-
Lights	41	0	62	74	-	177	166	1	6	1	-	174	169	818	328	17	-	1332	48	1265	7	1	-	1321	3004
% Lights	100.0	-	100.0	100.0	-	100.0	96.5	100.0	75.0	100.0	-	95.6	99.4	94.3	95.6	94.4	-	95.3	92.3	96.7	100.0	100.0	-	96.6	96.1
Other Vehicles	0	0	0	0	-	0	6	0	2	0	-	8	1	46	14	1	-	62	4	40	0	0	-	44	114
% Other Vehicles	0.0	-	0.0	0.0	-	0.0	3.5	0.0	25.0	0.0	-	4.4	0.6	5.3	4.1	5.6	-	4.4	7.7	3.1	0.0	0.0	-	3.2	3.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	3	1	0	-	4	0	3	0	0	-	3	7
% Bicycles on Road	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.3	0.3	0.0	-	0.3	0.0	0.2	0.0	0.0	-	0.2	0.2
Pedestrians	-	-	-	-	10	-	-	-	-	-	21	-	-	-	-	-	25	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Traffic Planning and Design, Inc
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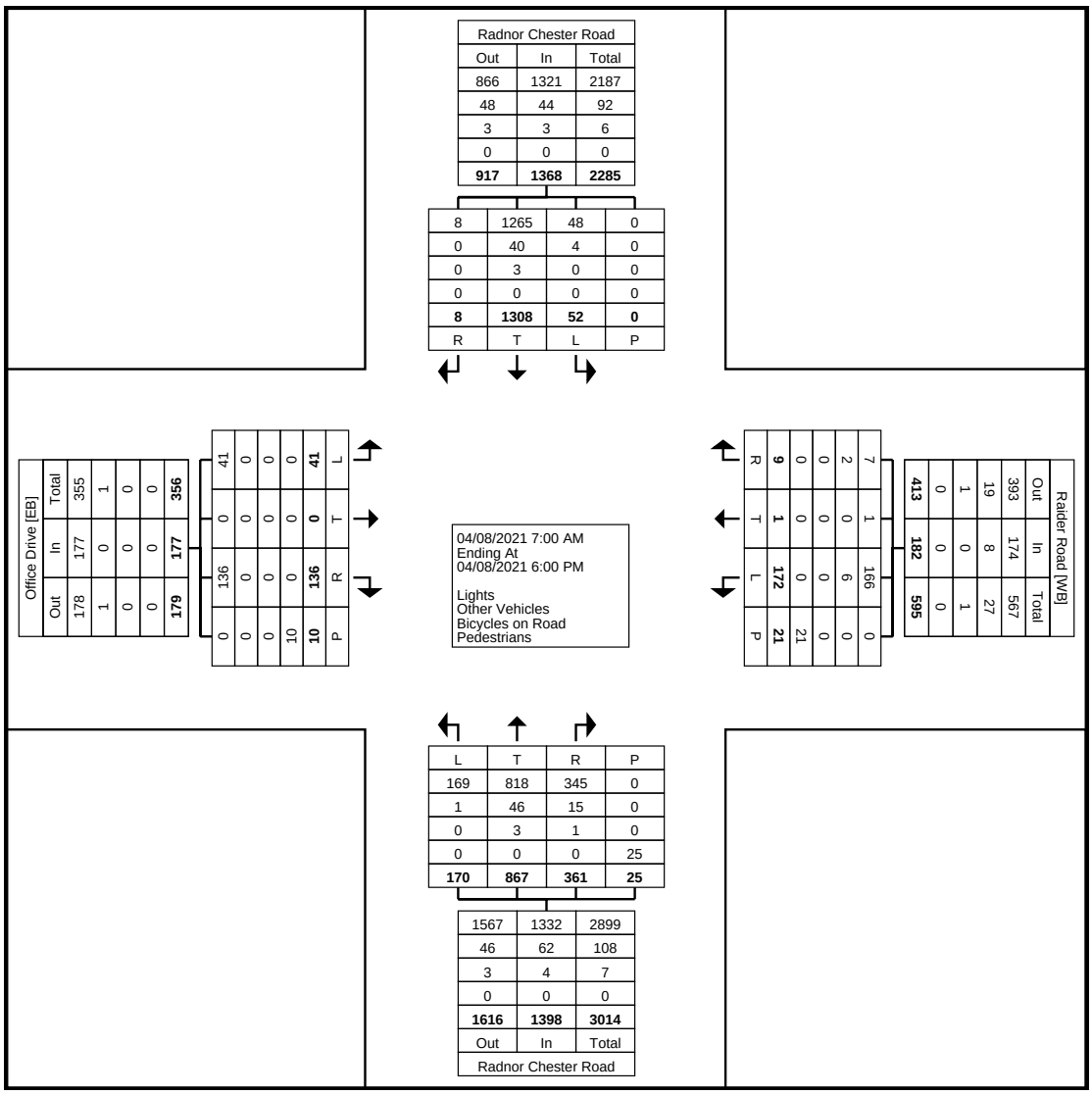
610.326.3100 jfunk@trafficpd.com

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Raider Road
Site Code:
Start Date: 04/08/2021



Turning Movement Data Plot

Traffic Planning and Design, Inc
2500 East High Street
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610.326.3100 jfunk@trafficpd.com

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Raider Road
Site Code:
Start Date: 04/08/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Office Drive Eastbound						Raider Road Westbound						Radnor Chester Road Northbound						Radnor Chester Road 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	
8:00 AM	1	0	1	1	1	3	12	0	1	0	1	13	16	62	56	1	2	135	9	62	1	0	0	72	223
8:15 AM	1	0	0	3	1	4	30	0	0	0	2	30	21	70	131	7	5	229	17	71	0	0	0	88	351
8:30 AM	2	0	4	3	0	9	22	0	0	0	1	22	14	55	22	0	1	91	6	62	0	0	0	68	190
8:45 AM	1	0	0	3	0	4	3	0	0	0	0	3	8	80	3	0	0	91	1	82	0	0	0	83	181
Total	5	0	5	10	2	20	67	0	1	0	4	68	59	267	212	8	8	546	33	277	1	0	0	311	945
Approach %	25.0	0.0	25.0	50.0	-	-	98.5	0.0	1.5	0.0	-	-	10.8	48.9	38.8	1.5	-	-	10.6	89.1	0.3	0.0	-	-	-
Total %	0.5	0.0	0.5	1.1	-	2.1	7.1	0.0	0.1	0.0	-	7.2	6.2	28.3	22.4	0.8	-	57.8	3.5	29.3	0.1	0.0	-	32.9	-
PHF	0.625	0.000	0.313	0.833	-	0.556	0.558	0.000	0.250	0.000	-	0.567	0.702	0.834	0.405	0.286	-	0.596	0.485	0.845	0.250	0.000	-	0.884	0.673
Lights	5	0	5	10	-	20	61	0	0	0	-	61	59	257	202	7	-	525	29	268	1	0	-	298	904
% Lights	100.0	-	100.0	100.0	-	100.0	91.0	-	0.0	-	-	89.7	100.0	96.3	95.3	87.5	-	96.2	87.9	96.8	100.0	-	-	95.8	95.7
Other Vehicles	0	0	0	0	-	0	6	0	1	0	-	7	0	10	10	1	-	21	4	9	0	0	-	13	41
% Other Vehicles	0.0	-	0.0	0.0	-	0.0	9.0	-	100.0	-	-	10.3	0.0	3.7	4.7	12.5	-	3.8	12.1	3.2	0.0	-	-	4.2	4.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	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	-	-	-	-	2	-	-	-	-	-	4	-	-	-	-	-	8	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Traffic Planning and Design, Inc
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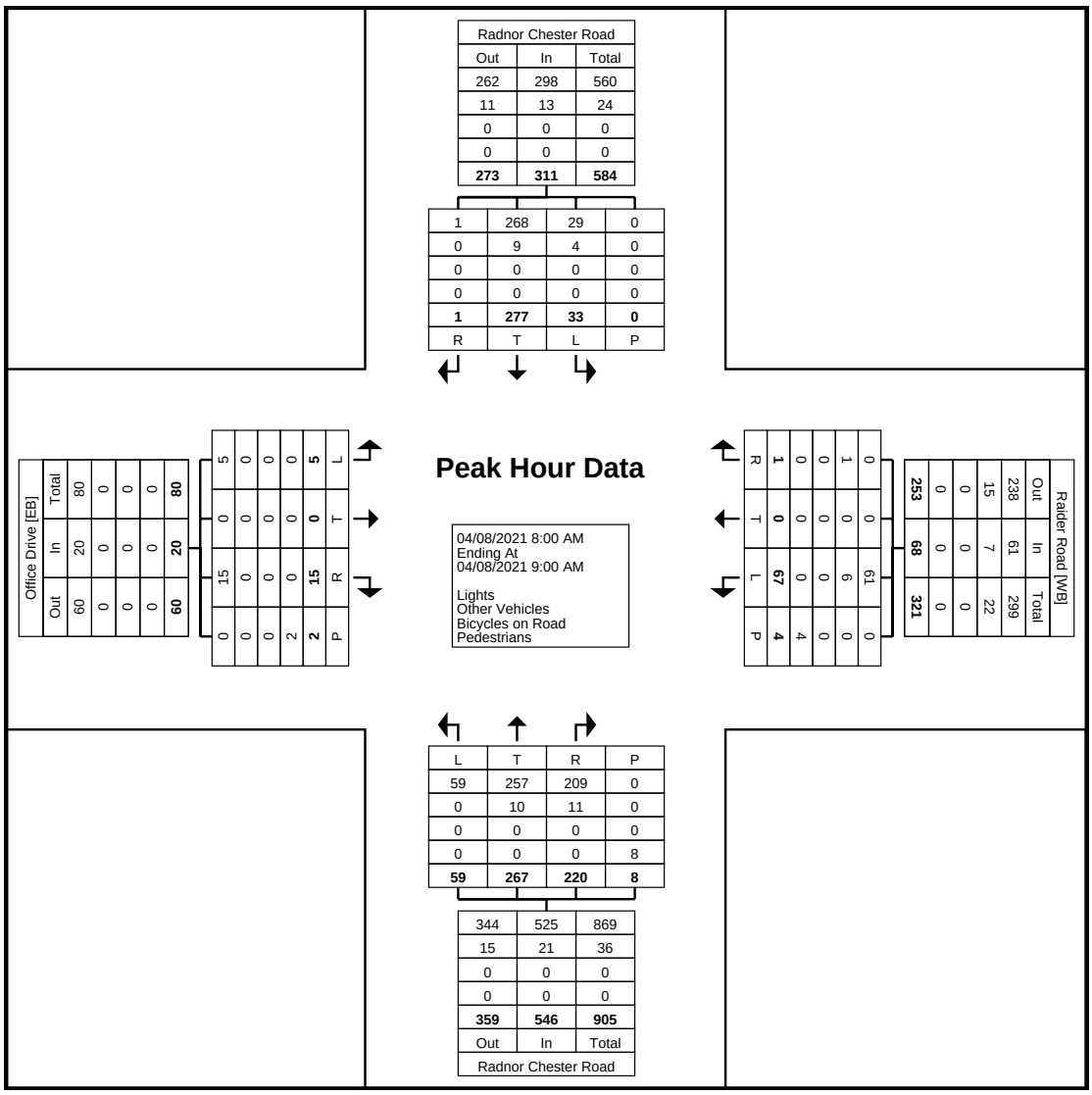
Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Raider Road
Site Code:
Start Date: 04/08/2021



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

Traffic Planning and Design, Inc
2500 East High Street
Suite 650
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Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Raider Road
Site Code:
Start Date: 04/08/2021

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Office Drive Eastbound						Raider Road Westbound						Radnor Chester Road Northbound						Radnor Chester Road 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	0	10	8	0	28	16	0	0	0	0	16	7	59	15	4	0	85	2	88	0	0	0	90	219
5:15 PM	5	0	4	6	0	15	19	0	2	0	0	21	6	44	16	2	0	68	1	113	0	0	0	114	218
5:30 PM	4	0	5	5	1	14	9	0	0	0	1	9	4	61	13	1	1	79	3	130	0	1	0	134	236
5:45 PM	3	0	4	8	2	15	17	0	2	0	0	19	3	52	5	2	0	62	3	109	1	0	0	113	209
Total	22	0	23	27	3	72	61	0	4	0	1	65	20	216	49	9	1	294	9	440	1	1	0	451	882
Approach %	30.6	0.0	31.9	37.5	-	-	93.8	0.0	6.2	0.0	-	-	6.8	73.5	16.7	3.1	-	-	2.0	97.6	0.2	0.2	-	-	-
Total %	2.5	0.0	2.6	3.1	-	8.2	6.9	0.0	0.5	0.0	-	7.4	2.3	24.5	5.6	1.0	-	33.3	1.0	49.9	0.1	0.1	-	51.1	-
PHF	0.550	0.000	0.575	0.844	-	0.643	0.803	0.000	0.500	0.000	-	0.774	0.714	0.885	0.766	0.563	-	0.865	0.750	0.846	0.250	0.250	-	0.841	0.934
Lights	22	0	23	27	-	72	61	0	4	0	-	65	20	211	47	9	-	287	9	434	1	1	-	445	869
% Lights	100.0	-	100.0	100.0	-	100.0	100.0	-	100.0	-	-	100.0	100.0	97.7	95.9	100.0	-	97.6	100.0	98.6	100.0	100.0	-	98.7	98.5
Other Vehicles	0	0	0	0	-	0	0	0	0	0	-	0	0	3	1	0	-	4	0	5	0	0	-	5	9
% Other Vehicles	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	-	-	0.0	0.0	1.4	2.0	0.0	-	1.4	0.0	1.1	0.0	0.0	-	1.1	1.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	2	1	0	-	3	0	1	0	0	-	1	4
% Bicycles on Road	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.9	2.0	0.0	-	1.0	0.0	0.2	0.0	0.0	-	0.2	0.5
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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Counter::
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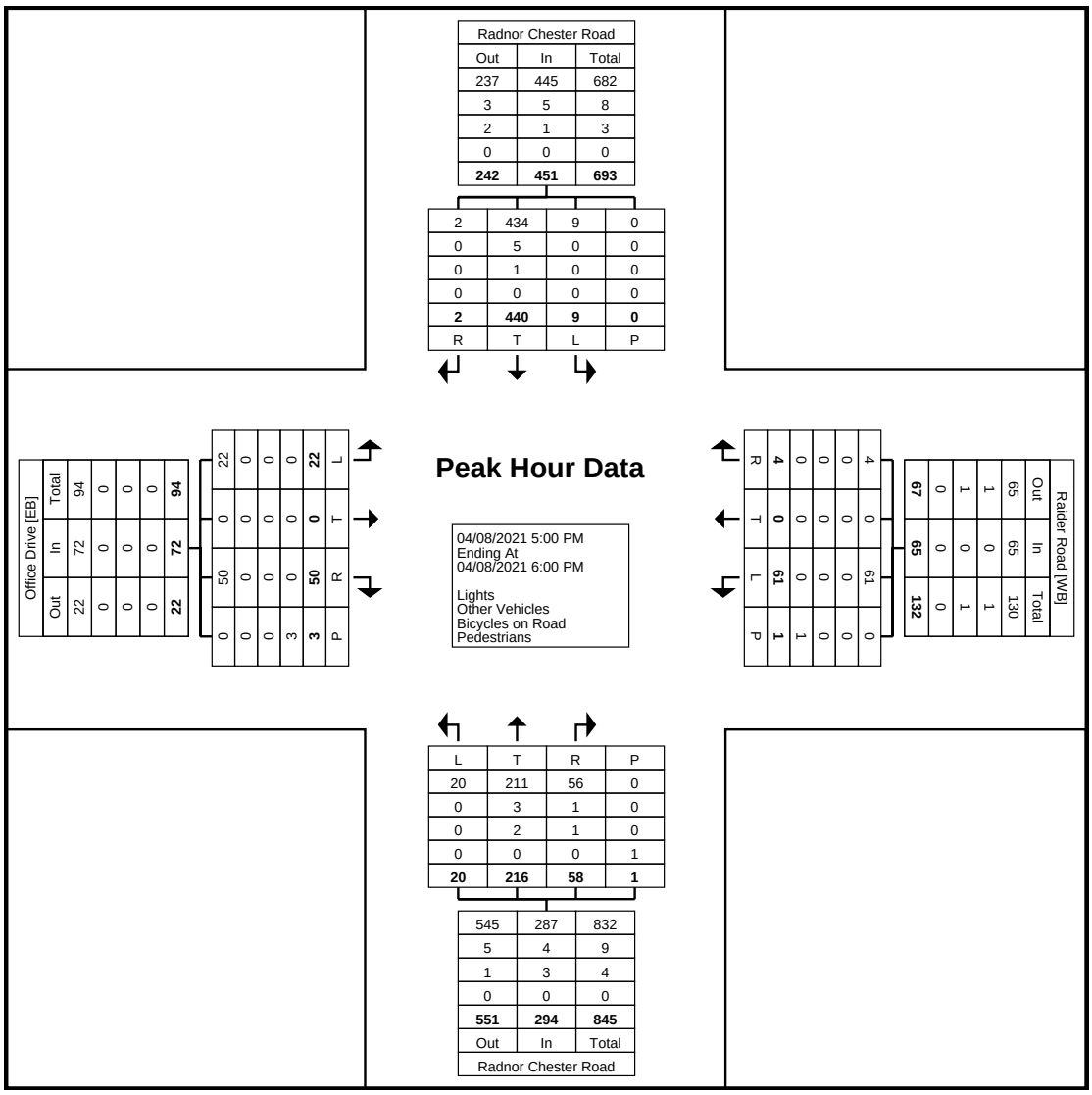
Weather::

Count Name: Radnor-Chester Road and Raider Road
Site Code:
Start Date: 04/08/2021



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

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

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Loop Road
Site Code:
Start Date: 04/08/2021

Turning Movement Data

Start Time	Loop Road Westbound				Radnor Chester Road Northbound				Radnor Chester Road Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	23	2	0	25	2	32	0	34	59
7:15 AM	1	1	0	2	25	0	0	25	1	50	0	51	78
7:30 AM	0	0	0	0	38	1	0	39	1	54	0	55	94
7:45 AM	0	0	0	0	55	3	0	58	2	73	0	75	133
Hourly Total	1	1	0	2	141	6	0	147	6	209	0	215	364
8:00 AM	0	0	14	0	70	3	0	73	2	77	0	79	152
8:15 AM	2	1	68	3	119	7	0	126	2	91	0	93	222
8:30 AM	1	0	7	1	61	3	0	64	1	75	0	76	141
8:45 AM	2	1	0	3	75	3	0	78	2	84	0	86	167
Hourly Total	5	2	89	7	325	16	0	341	7	327	0	334	682
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	1	3	23	4	82	1	0	83	0	105	0	105	192
4:15 PM	3	3	6	6	70	1	0	71	1	111	0	112	189
4:30 PM	3	0	23	3	57	0	0	57	2	103	0	105	165
4:45 PM	0	2	4	2	53	0	0	53	1	105	0	106	161
Hourly Total	7	8	56	15	262	2	0	264	4	424	0	428	707
5:00 PM	2	1	0	3	74	1	0	75	1	88	0	89	167
5:15 PM	2	2	0	4	58	1	0	59	0	117	0	117	180
5:30 PM	1	0	0	1	67	1	0	68	1	128	0	129	198
5:45 PM	5	2	1	7	62	2	0	64	2	99	0	101	172
Hourly Total	10	5	1	15	261	5	0	266	4	432	0	436	717
Grand Total	23	16	146	39	989	29	0	1018	21	1392	0	1413	2470
Approach %	59.0	41.0	-	-	97.2	2.8	-	-	1.5	98.5	-	-	-
Total %	0.9	0.6	-	1.6	40.0	1.2	-	41.2	0.9	56.4	-	57.2	-
Lights	19	14	-	33	938	27	-	965	20	1347	-	1367	2365
% Lights	82.6	87.5	-	84.6	94.8	93.1	-	94.8	95.2	96.8	-	96.7	95.7
Other Vehicles	3	2	-	5	49	2	-	51	1	43	-	44	100
% Other Vehicles	13.0	12.5	-	12.8	5.0	6.9	-	5.0	4.8	3.1	-	3.1	4.0
Bicycles on Road	1	0	-	1	2	0	-	2	0	2	-	2	5
% Bicycles on Road	4.3	0.0	-	2.6	0.2	0.0	-	0.2	0.0	0.1	-	0.1	0.2
Pedestrians	-	-	146	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Counter::
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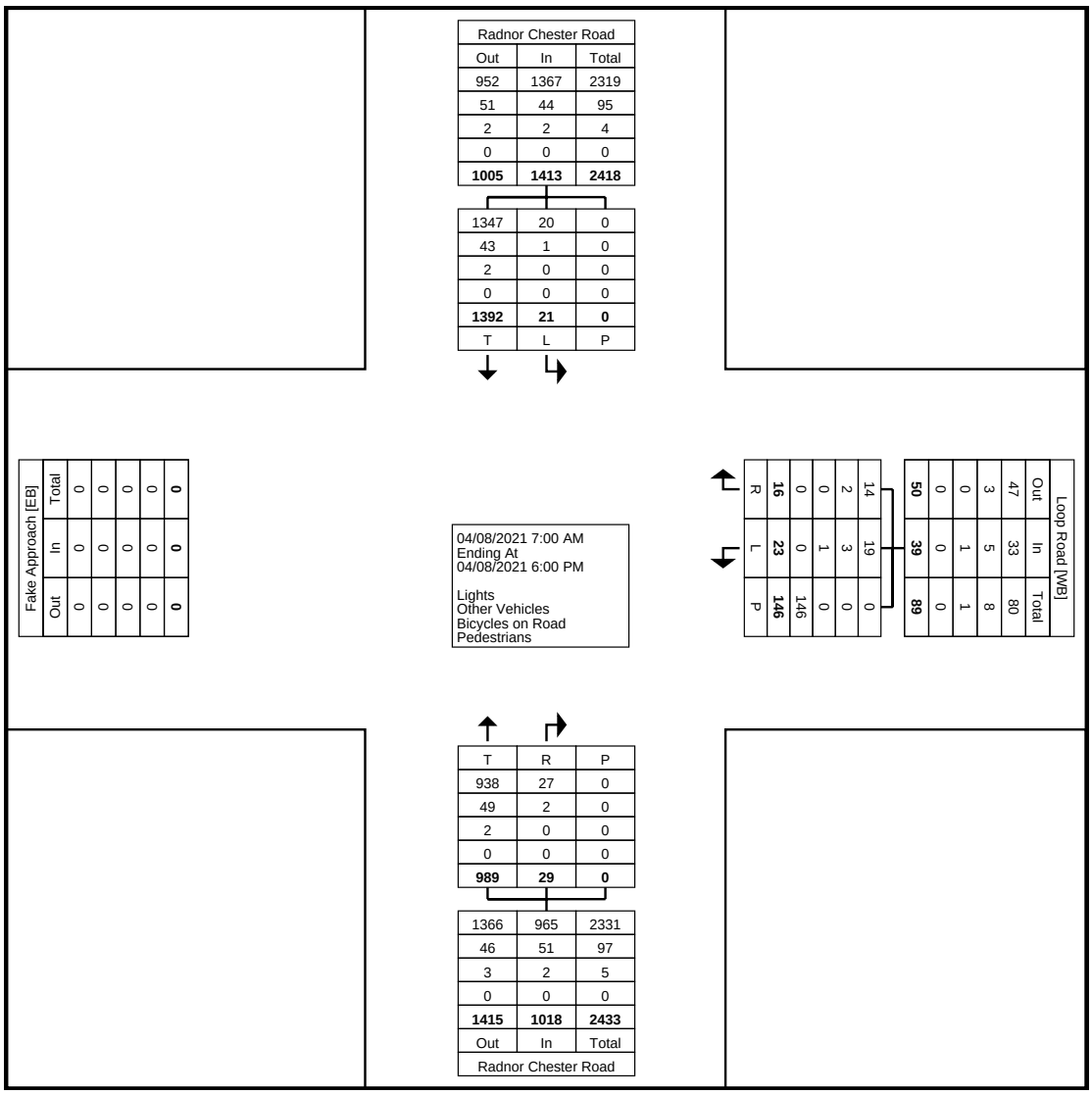
Count Name: Radnor-Chester Road and Loop Road
Site Code:
Start Date: 04/08/2021



Turning Movement Data Plot

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Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Loop Road
Site Code:
Start Date: 04/08/2021

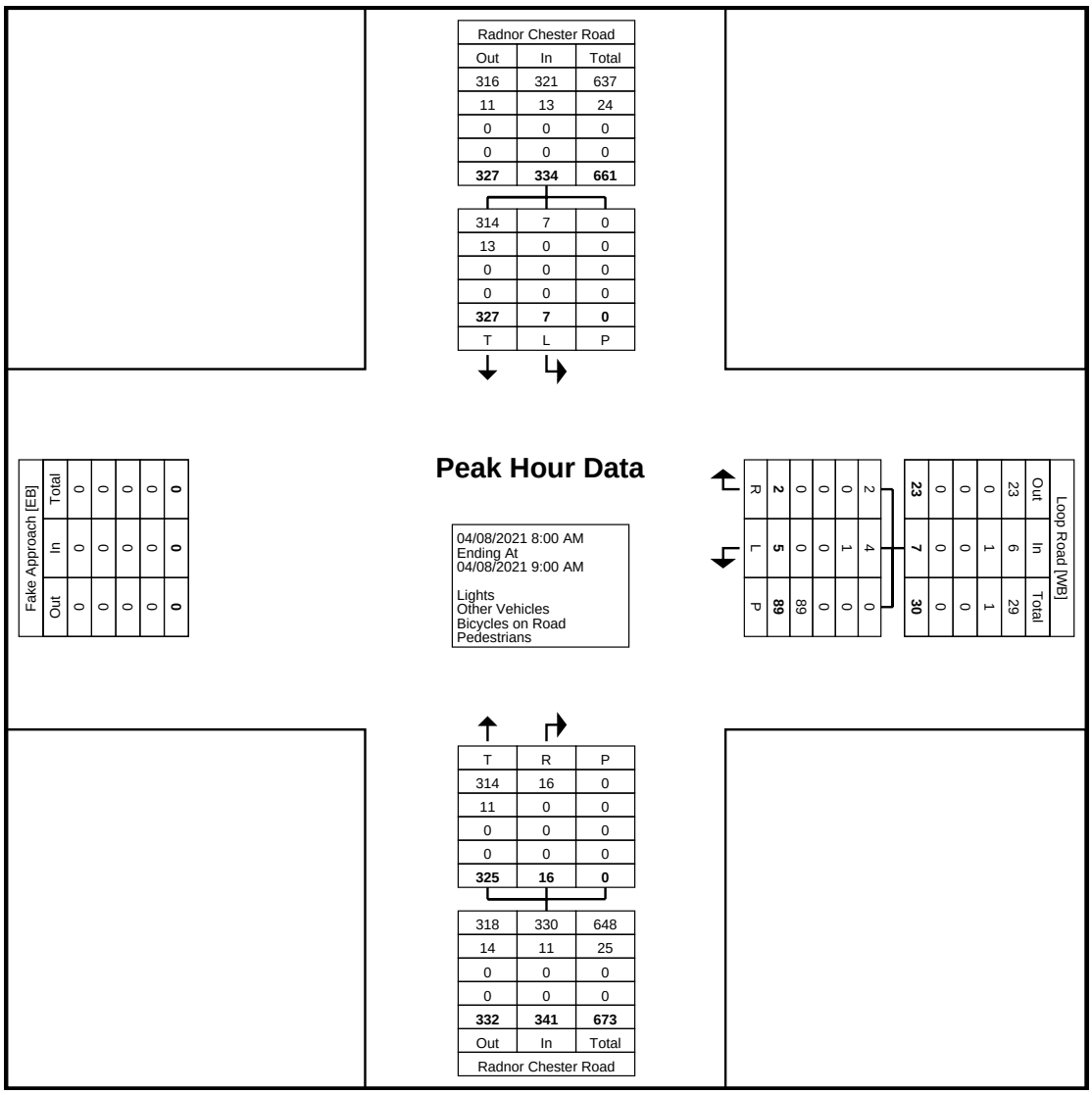
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Loop Road Westbound				Radnor Chester Road Northbound				Radnor Chester Road Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
8:00 AM	0	0	14	0	70	3	0	73	2	77	0	79	152
8:15 AM	2	1	68	3	119	7	0	126	2	91	0	93	222
8:30 AM	1	0	7	1	61	3	0	64	1	75	0	76	141
8:45 AM	2	1	0	3	75	3	0	78	2	84	0	86	167
Total	5	2	89	7	325	16	0	341	7	327	0	334	682
Approach %	71.4	28.6	-	-	95.3	4.7	-	-	2.1	97.9	-	-	-
Total %	0.7	0.3	-	1.0	47.7	2.3	-	50.0	1.0	47.9	-	49.0	-
PHF	0.625	0.500	-	0.583	0.683	0.571	-	0.677	0.875	0.898	-	0.898	0.768
Lights	4	2	-	6	314	16	-	330	7	314	-	321	657
% Lights	80.0	100.0	-	85.7	96.6	100.0	-	96.8	100.0	96.0	-	96.1	96.3
Other Vehicles	1	0	-	1	11	0	-	11	0	13	-	13	25
% Other Vehicles	20.0	0.0	-	14.3	3.4	0.0	-	3.2	0.0	4.0	-	3.9	3.7
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	89	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Loop Road
Site Code:
Start Date: 04/08/2021



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

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610.326.3100 jfunk@trafficpd.com

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Loop Road
Site Code:
Start Date: 04/08/2021

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Loop Road Westbound				Radnor Chester Road Northbound				Radnor Chester Road Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
5:00 PM	2	1	0	3	74	1	0	75	1	88	0	89	167
5:15 PM	2	2	0	4	58	1	0	59	0	117	0	117	180
5:30 PM	1	0	0	1	67	1	0	68	1	128	0	129	198
5:45 PM	5	2	1	7	62	2	0	64	2	99	0	101	172
Total	10	5	1	15	261	5	0	266	4	432	0	436	717
Approach %	66.7	33.3	-	-	98.1	1.9	-	-	0.9	99.1	-	-	-
Total %	1.4	0.7	-	2.1	36.4	0.7	-	37.1	0.6	60.3	-	60.8	-
PHF	0.500	0.625	-	0.536	0.882	0.625	-	0.887	0.500	0.844	-	0.845	0.905
Lights	9	4	-	13	257	4	-	261	4	428	-	432	706
% Lights	90.0	80.0	-	86.7	98.5	80.0	-	98.1	100.0	99.1	-	99.1	98.5
Other Vehicles	0	1	-	1	3	1	-	4	0	4	-	4	9
% Other Vehicles	0.0	20.0	-	6.7	1.1	20.0	-	1.5	0.0	0.9	-	0.9	1.3
Bicycles on Road	1	0	-	1	1	0	-	1	0	0	-	0	2
% Bicycles on Road	10.0	0.0	-	6.7	0.4	0.0	-	0.4	0.0	0.0	-	0.0	0.3
Pedestrians	-	-	1	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Suite 650
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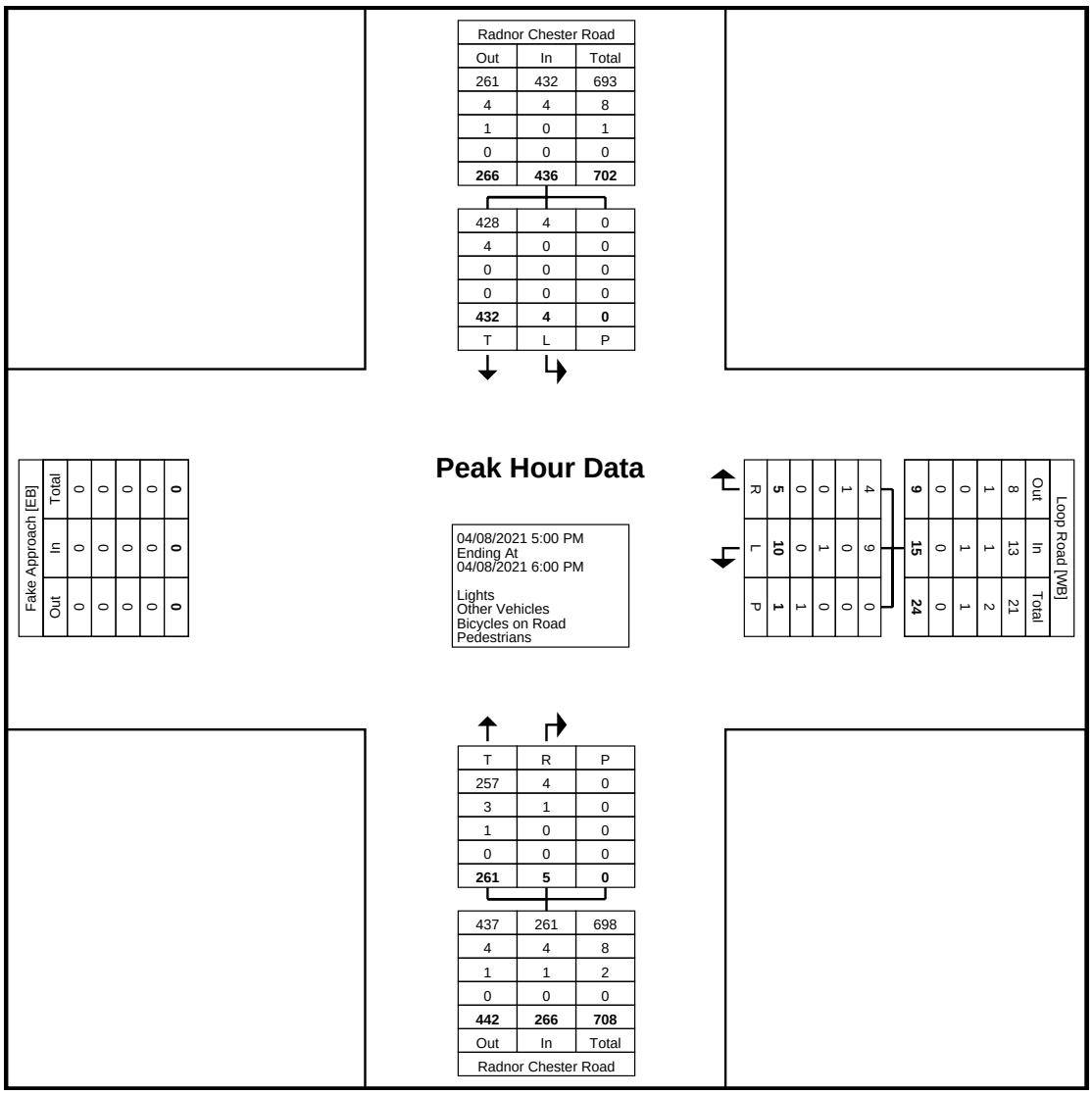
610.326.3100 jfunk@trafficpd.com

Counter::
Counted By::
Weather::

Count Name: Radnor-Chester Road and Loop Road
Site Code:
Start Date: 04/08/2021



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

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610.326.3100 jfunk@trafficpd.com

Counter:: Mio
Counted By:: Mio
Weather:: Clear

Count Name: King Of Prussia Road and Loop Road
Site Code:
Start Date: 04/08/2021

Turning Movement Data

Start Time	King Of Prussia Road Eastbound					King Of Prussia Road Westbound					Loop Road Northbound					Office Drive Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	0	53	1	0	54	1	71	0	0	72	0	0	0	0	0	0	0	0	3	0	126
7:15 AM	0	54	0	0	54	1	119	0	0	120	0	0	0	0	0	0	0	0	1	0	174
7:30 AM	0	79	2	0	81	2	114	1	0	117	0	0	2	0	2	0	0	0	2	0	200
7:45 AM	0	78	0	0	78	6	144	4	0	154	1	0	1	1	2	0	0	0	0	0	234
Hourly Total	0	264	3	0	267	10	448	5	0	463	1	0	3	1	4	0	0	0	6	0	734
8:00 AM	0	66	3	0	69	2	124	3	0	129	3	0	0	0	3	0	0	0	0	0	201
8:15 AM	2	87	1	0	90	7	133	3	0	143	1	0	1	0	2	1	0	0	1	1	236
8:30 AM	2	71	0	0	73	2	117	4	0	123	0	0	0	0	0	0	0	0	4	0	196
8:45 AM	3	84	2	0	89	9	117	10	0	136	0	0	2	0	2	1	0	0	1	1	228
Hourly Total	7	308	6	0	321	20	491	20	0	531	4	0	3	0	7	2	0	0	6	2	861
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	102	1	0	103	1	141	1	0	143	0	0	4	0	4	3	0	0	0	3	253
4:15 PM	0	82	1	0	83	1	132	0	0	133	0	0	2	1	2	2	0	1	0	3	221
4:30 PM	1	64	0	0	65	0	131	2	0	133	2	0	5	0	7	4	0	1	0	5	210
4:45 PM	0	91	2	0	93	2	95	4	0	101	1	0	0	0	1	4	0	1	1	5	200
Hourly Total	1	339	4	0	344	4	499	7	0	510	3	0	11	1	14	13	0	3	1	16	884
5:00 PM	0	100	2	0	102	0	93	1	0	94	2	0	3	0	5	2	0	0	2	2	203
5:15 PM	0	96	1	0	97	1	110	1	0	112	0	0	2	0	2	2	0	0	1	2	213
5:30 PM	0	92	0	0	92	2	135	1	0	138	0	0	4	0	4	1	0	1	2	2	236
5:45 PM	0	90	0	0	90	2	95	0	0	97	1	0	0	0	1	1	0	0	1	1	189
Hourly Total	0	378	3	0	381	5	433	3	0	441	3	0	9	0	12	6	0	1	6	7	841
Grand Total	8	1289	16	0	1313	39	1871	35	0	1945	11	0	26	2	37	21	0	4	19	25	3320
Approach %	0.6	98.2	1.2	-	-	2.0	96.2	1.8	-	-	29.7	0.0	70.3	-	-	84.0	0.0	16.0	-	-	-
Total %	0.2	38.8	0.5	-	39.5	1.2	56.4	1.1	-	58.6	0.3	0.0	0.8	-	1.1	0.6	0.0	0.1	-	0.8	-
Lights	8	1229	15	-	1252	38	1815	34	-	1887	11	0	26	-	37	21	0	4	-	25	3201
% Lights	100.0	95.3	93.8	-	95.4	97.4	97.0	97.1	-	97.0	100.0	-	100.0	-	100.0	100.0	-	100.0	-	100.0	96.4
Other Vehicles	0	58	1	-	59	1	56	1	-	58	0	0	0	-	0	0	0	0	-	0	117
% Other Vehicles	0.0	4.5	6.3	-	4.5	2.6	3.0	2.9	-	3.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	3.5
Bicycles on Road	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.1
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-	-	-	19	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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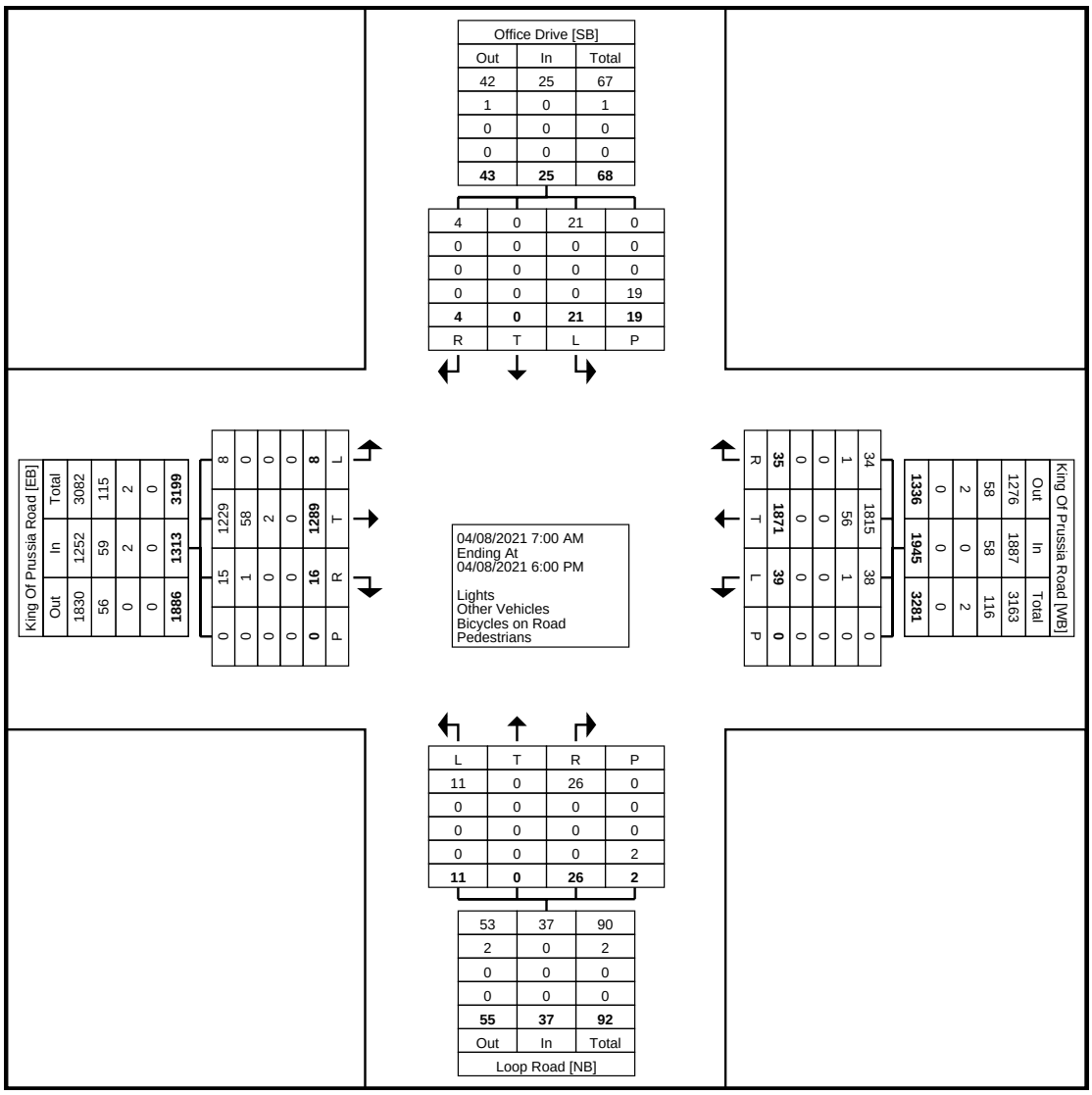
Counter:: Mio
Counted By:: Mio
Weather:: Clear

Count Name: King Of Prussia Road and Loop Road
Site Code:
Start Date: 04/08/2021



Turning Movement Data Plot

Traffic Planning and Design, Inc
2500 East High Street
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610.326.3100 jfunk@trafficpd.com

Counter:: Mio
Counted By:: Mio
Weather:: Clear

Count Name: King Of Prussia Road and Loop Road
Site Code:
Start Date: 04/08/2021

Turning Movement Peak Hour Data (7:30 AM)

Start Time	King Of Prussia Road Eastbound					King Of Prussia Road Westbound					Loop Road Northbound					Office Drive Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	0	79	2	0	81	2	114	1	0	117	0	0	2	0	2	0	0	0	2	0	200
7:45 AM	0	78	0	0	78	6	144	4	0	154	1	0	1	1	2	0	0	0	0	0	234
8:00 AM	0	66	3	0	69	2	124	3	0	129	3	0	0	0	3	0	0	0	0	0	201
8:15 AM	2	87	1	0	90	7	133	3	0	143	1	0	1	0	2	1	0	0	1	1	236
Total	2	310	6	0	318	17	515	11	0	543	5	0	4	1	9	1	0	0	3	1	871
Approach %	0.6	97.5	1.9	-	-	3.1	94.8	2.0	-	-	55.6	0.0	44.4	-	-	100.0	0.0	0.0	-	-	-
Total %	0.2	35.6	0.7	-	36.5	2.0	59.1	1.3	-	62.3	0.6	0.0	0.5	-	1.0	0.1	0.0	0.0	-	0.1	-
PHF	0.250	0.891	0.500	-	0.883	0.607	0.894	0.688	-	0.881	0.417	0.000	0.500	-	0.750	0.250	0.000	0.000	-	0.250	0.923
Lights	2	298	6	-	306	17	495	10	-	522	5	0	4	-	9	1	0	0	-	1	838
% Lights	100.0	96.1	100.0	-	96.2	100.0	96.1	90.9	-	96.1	100.0	-	100.0	-	100.0	100.0	-	-	-	100.0	96.2
Other Vehicles	0	11	0	-	11	0	20	1	-	21	0	0	0	-	0	0	0	0	-	0	32
% Other Vehicles	0.0	3.5	0.0	-	3.5	0.0	3.9	9.1	-	3.9	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	3.7
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.3	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	0.1
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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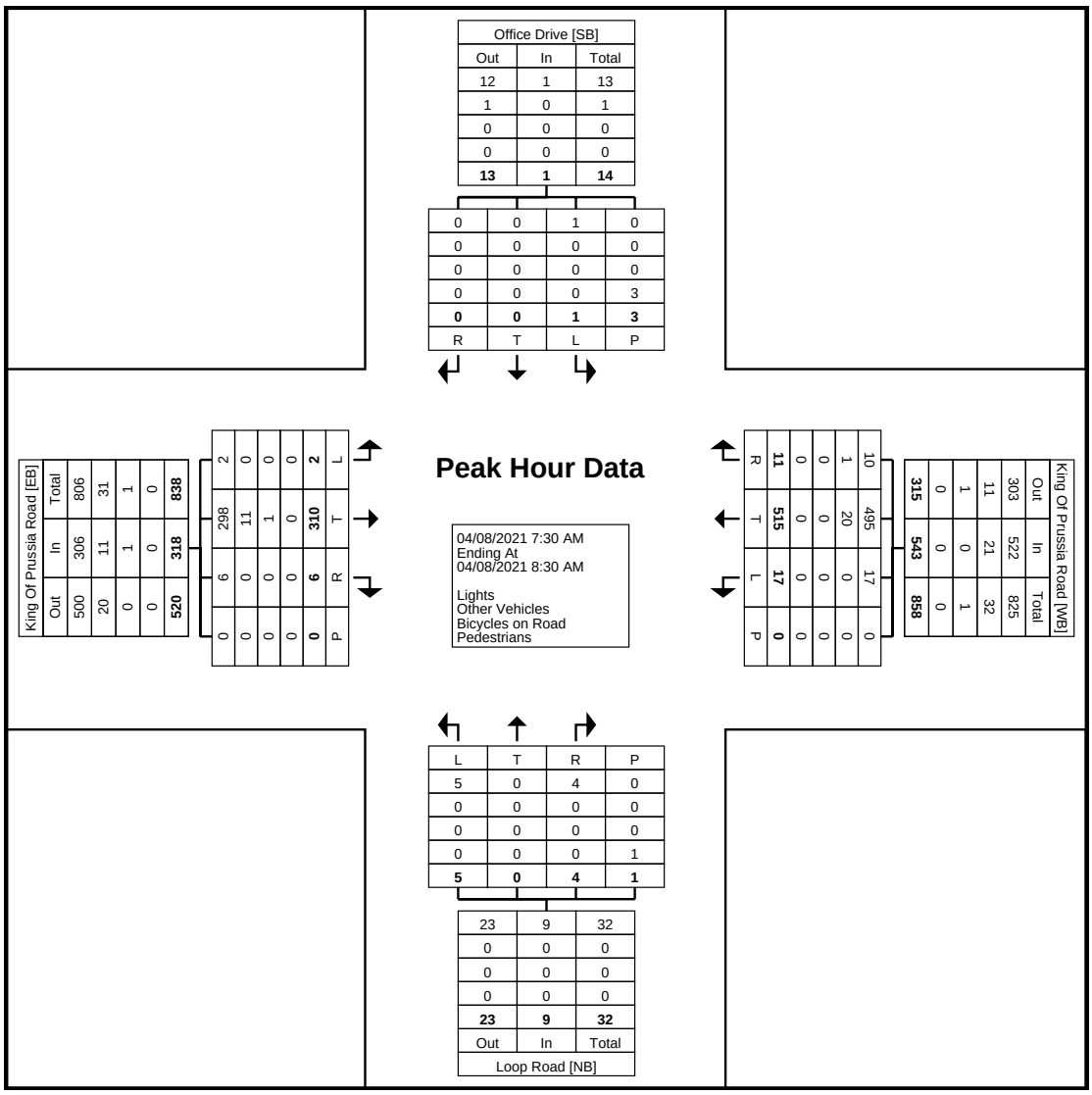
Counter:: Mio
Counted By:: Mio
Weather:: Clear

Count Name: King Of Prussia Road and Loop Road
Site Code:
Start Date: 04/08/2021



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

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Counter:: Mio
Counted By:: Mio
Weather:: Clear

Count Name: King Of Prussia Road and Loop Road
Site Code:
Start Date: 04/08/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	King Of Prussia Road Eastbound					King Of Prussia Road Westbound					Loop Road Northbound					Office Drive Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:00 PM	0	102	1	0	103	1	141	1	0	143	0	0	4	0	4	3	0	0	0	3	253
4:15 PM	0	82	1	0	83	1	132	0	0	133	0	0	2	1	2	2	0	1	0	3	221
4:30 PM	1	64	0	0	65	0	131	2	0	133	2	0	5	0	7	4	0	1	0	5	210
4:45 PM	0	91	2	0	93	2	95	4	0	101	1	0	0	0	1	4	0	1	1	5	200
Total	1	339	4	0	344	4	499	7	0	510	3	0	11	1	14	13	0	3	1	16	884
Approach %	0.3	98.5	1.2	-	-	0.8	97.8	1.4	-	-	21.4	0.0	78.6	-	-	81.3	0.0	18.8	-	-	-
Total %	0.1	38.3	0.5	-	38.9	0.5	56.4	0.8	-	57.7	0.3	0.0	1.2	-	1.6	1.5	0.0	0.3	-	1.8	-
PHF	0.250	0.831	0.500	-	0.835	0.500	0.885	0.438	-	0.892	0.375	0.000	0.550	-	0.500	0.813	0.000	0.750	-	0.800	0.874
Lights	1	312	3	-	316	4	495	7	-	506	3	0	11	-	14	13	0	3	-	16	852
% Lights	100.0	92.0	75.0	-	91.9	100.0	99.2	100.0	-	99.2	100.0	-	100.0	-	100.0	100.0	-	100.0	-	100.0	96.4
Other Vehicles	0	26	1	-	27	0	4	0	-	4	0	0	0	-	0	0	0	0	-	0	31
% Other Vehicles	0.0	7.7	25.0	-	7.8	0.0	0.8	0.0	-	0.8	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	3.5
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.3	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.1
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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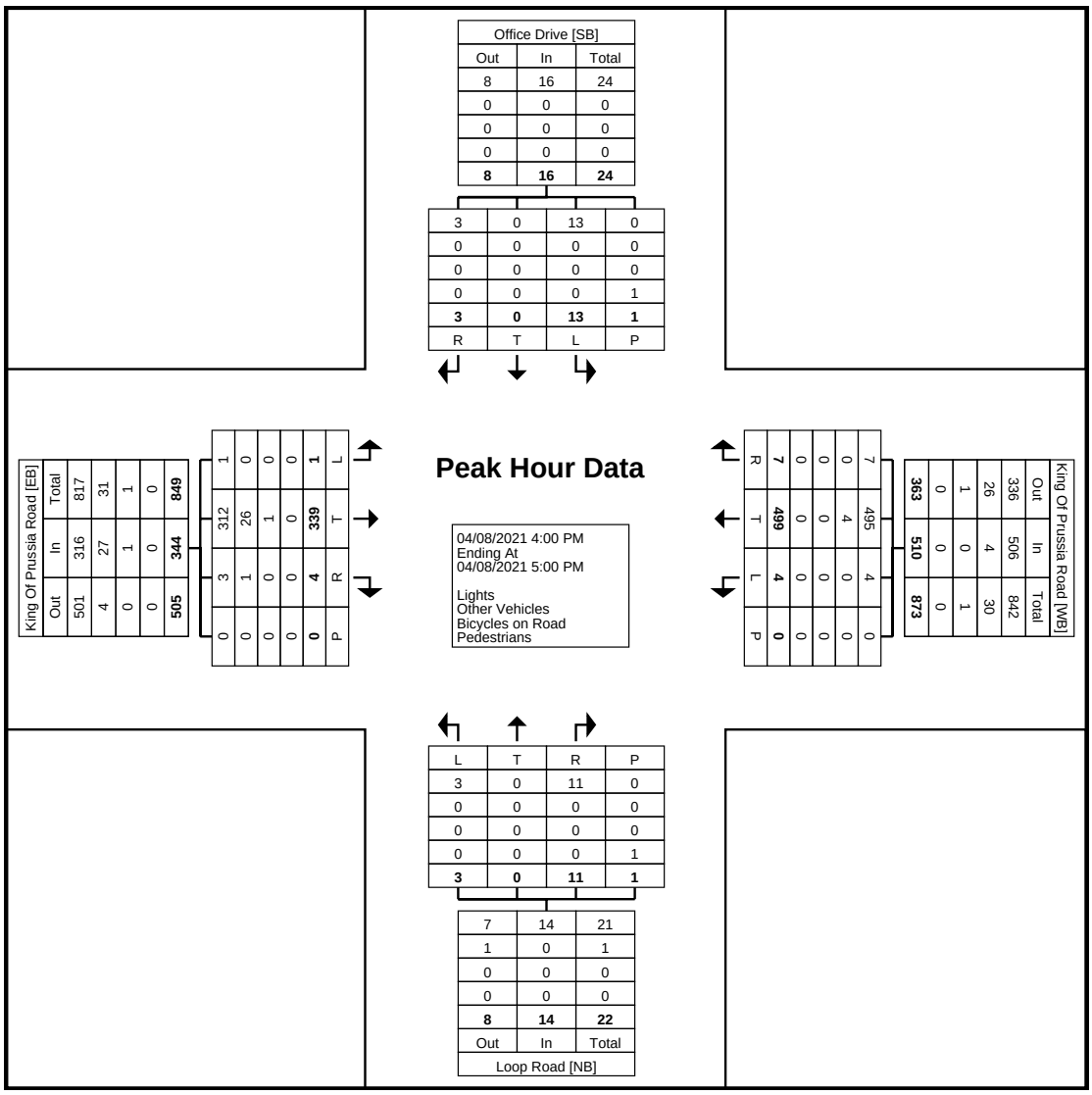
Counter:: Mio
Counted By:: Mio
Weather:: Clear

Count Name: King Of Prussia Road and Loop Road
Site Code:
Start Date: 04/08/2021



Turning Movement Peak Hour Data Plot (4:00 PM)

Gap Calculation for Unsignalized Intersection
Left Turn from Minor Road to 2-Lane Major Road

Intersection: **Major St.** **King of Prussia Road**
Minor St. **250 Office Loop Road**

Time Studied: **Weekday A.M. Peak Hour**
Date of Study: **4/8/2021**

Critical Gap: **6.5**
Follow-Up Time: **3.0**

COVID Adjustement
-26.87%

Length of Gap (seconds)	Vehicles Accomodated	Number of Gaps Observed	Total Vehicles	COVID Adjusted	Adjusted Vehicles
0 - 6.4	0	74	0	73.13%	0
6.5 - 9.4	1	14	14	73.13%	10
9.5 - 12.4	2	11	22	73.13%	16
12.5 - 15.4	3	15	45	73.13%	33
15.5 - 18.4	4	15	60	73.13%	44
18.5 - 21.4	5	3	15	73.13%	11
21.5 - 24.4	6	2	12	73.13%	9
24.5 - 27.4	7	2	14	73.13%	10
27.5+	8	13	104	73.13%	76
Total Vehicles Accomodated			**286**		**209**

Minimum Gap	Number of Cars
0	0
6.5	1
9.5	2
12.5	3
15.5	4
18.5	5
21.5	6
24.5	7
27.5	8

Gap Calculation for Unsignalized Intersection
Left Turn from Minor Road to 2-Lane Major Road

Intersection: **Major St.** **King of Prussia Road**
Minor St. **250 Office Loop Road**

Time Studied: **Weekday P.M. Peak Hour**
Date of Study: **4/8/2021**

Critical Gap: **6.5**
Follow-Up Time: **3.0**

COVID Adjustement
-37.80%

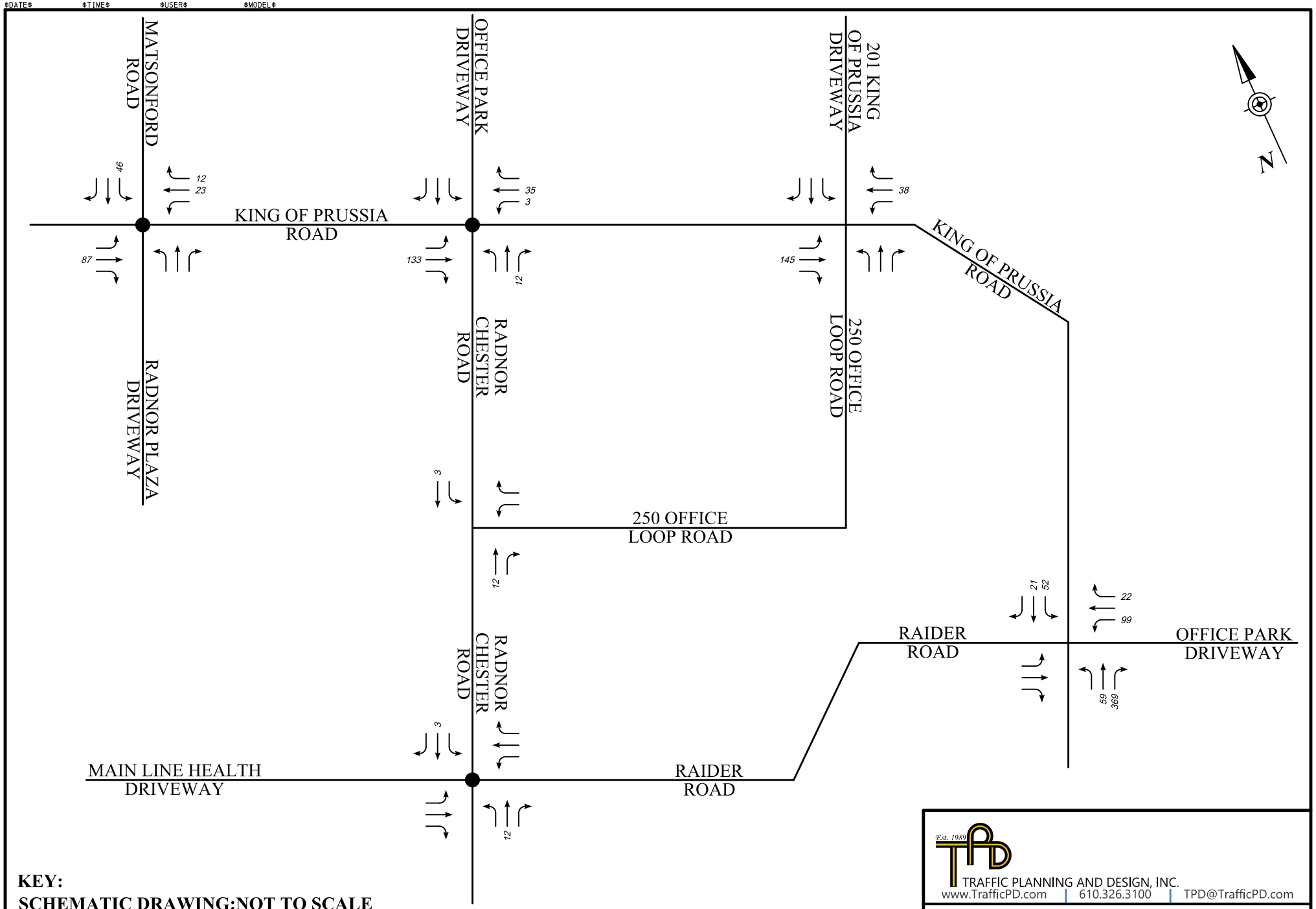
Length of Gap (seconds)	Vehicles Accomodated	Number of Gaps Observed	Total Vehicles	COVID Adjusted	Adjusted Vehicles
0 - 6.4	0	55	0	62.20%	0
6.5 - 9.4	1	24	24	62.20%	15
9.5 - 12.4	2	19	38	62.20%	24
12.5 - 15.4	3	8	24	62.20%	15
15.5 - 18.4	4	12	48	62.20%	30
18.5 - 21.4	5	4	20	62.20%	12
21.5 - 24.4	6	8	48	62.20%	30
24.5 - 27.4	7	8	56	62.20%	35
27.5+	8	7	56	62.20%	35
Total Vehicles Accomodated			**314**		**195**

Minimum Gap	Number of Cars
0	0
6.5	1
9.5	2
12.5	3
15.5	4
18.5	5
21.5	6
24.5	7
27.5	8

Appendix D

Other Committed Developments

$FILE$
$DATE$ $TIME$ $USER$ $MODEL$



KEY:

SCHEMATIC DRAWING:NOT TO SCALE

STOP CONTROLLED

SIGNALIZED INTERSECTION

Est. 1989
TRAFFIC PLANNING AND DESIGN, INC.
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FIGURE D-1

MIX-USE MEDICAL FACILITY DEVELOPMENT
WEEKDAY AM PEAK HOUR
TRAFFIC VOLUMES

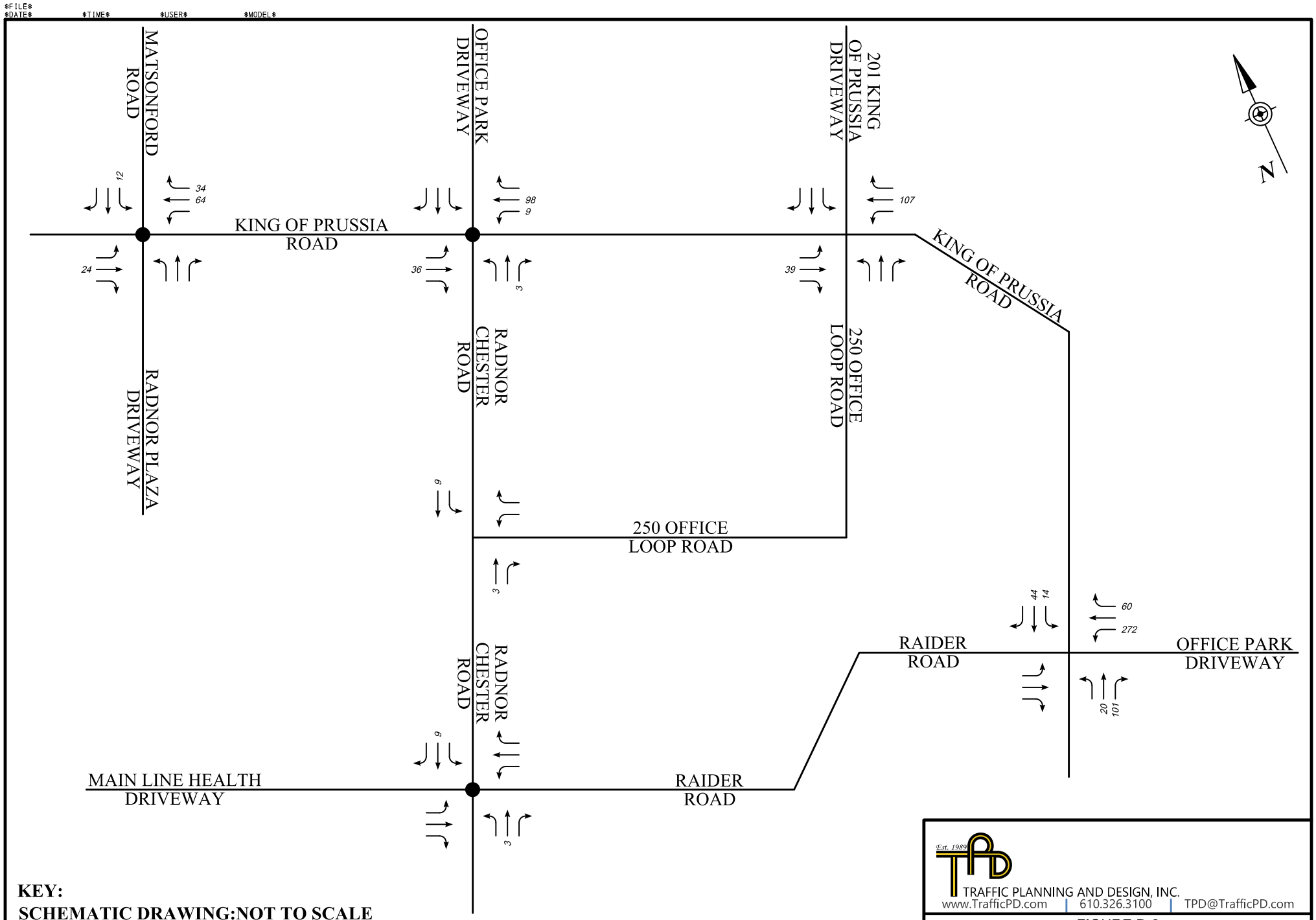
$FILE$
$DATE$
$TIME$
$USER$
$MODEL$
MATSONFORD ROAD
OFFICE PARK DRIVEWAY
201 KING OF PRUSSIA DRIVEWAY
KING OF PRUSSIA ROAD
RADNOR CHESTER ROAD
RADNOR PLAZA DRIVEWAY
250 OFFICE LOOP ROAD
RAIDER ROAD
MAIN LINE HEALTH DRIVEWAY
N
12
34
64
98
9
107
24
36
3
39
6
3
44
14
60
272
20
101
9
3
KEY:
SCHEMATIC DRAWING:NOT TO SCALE
STOP CONTROLLED
SIGNALIZED INTERSECTION
Est. 1989
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FIGURE D-2
MIX-USE MEDICAL FACILITY DEVELOPMENT
WEEKDAY PM PEAK HOUR
TRAFFIC VOLUMES

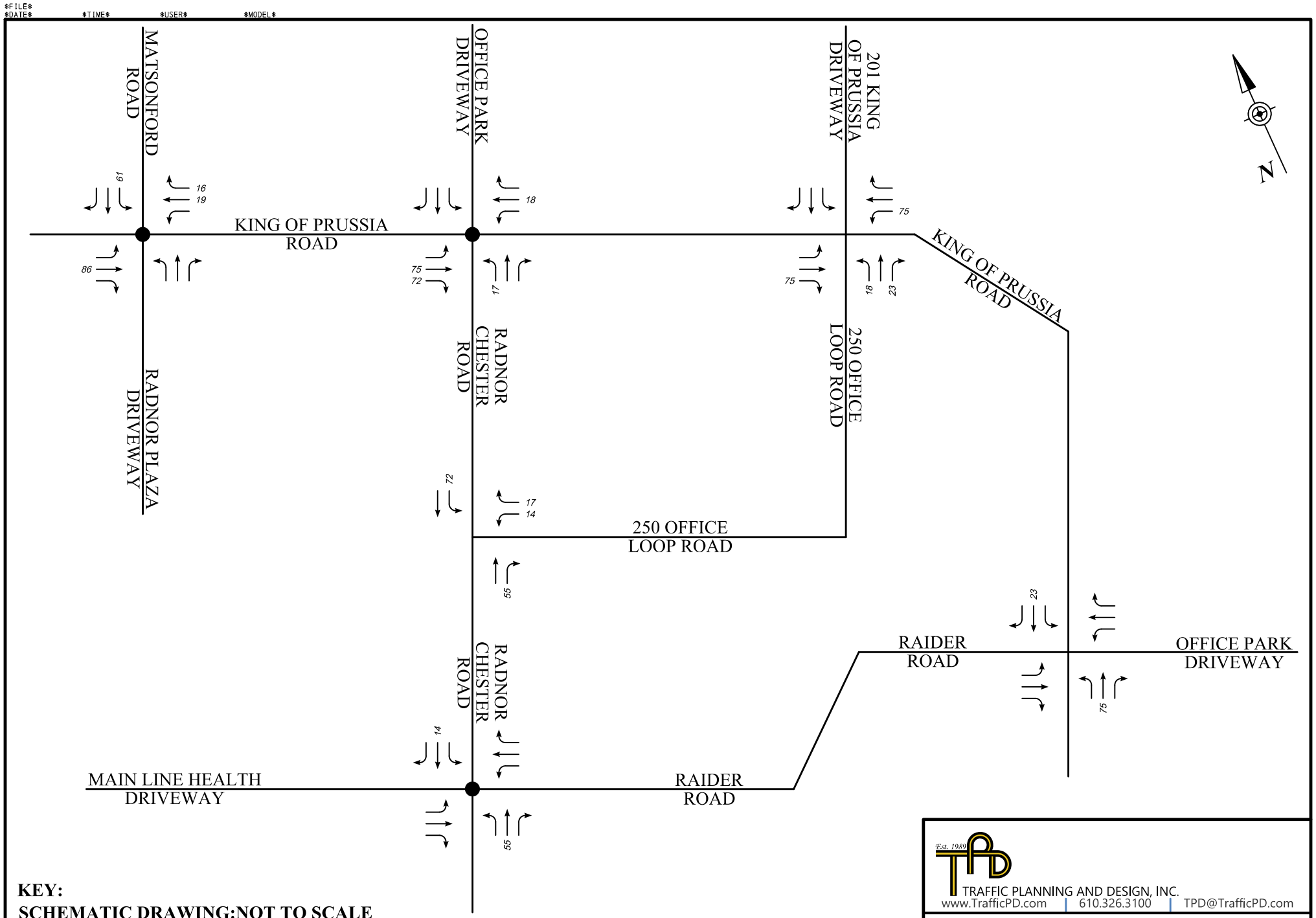
$FILE$
$DATE$
$TIME$
$USER$
$MODEL$
MATSONFORD ROAD
OFFICE PARK DRIVEWAY
201 KING OF PRUSSIA DRIVEWAY
KING OF PRUSSIA ROAD
RADNOR CHESTER ROAD
RADNOR PLAZA DRIVEWAY
250 OFFICE LOOP ROAD
RAIDER ROAD
MAIN LINE HEALTH DRIVEWAY
N
KEY:
SCHEMATIC DRAWING:NOT TO SCALE
STOP CONTROLLED
SIGNALIZED INTERSECTION
Est. 1989
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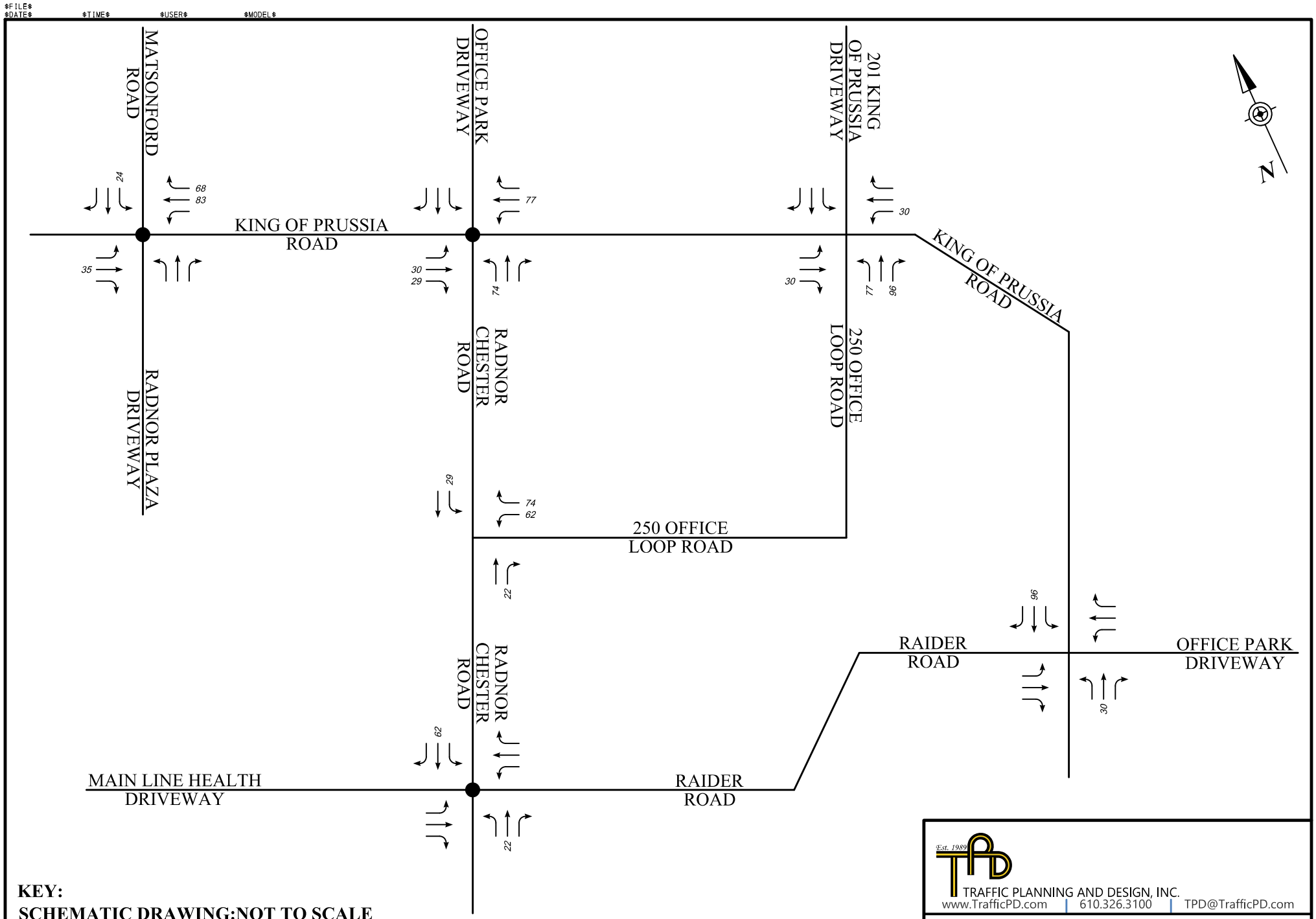
FIGURE D-3
250 KING OF PRUSSIA ROAD DEVELOPMENT
WEEKDAY AM PEAK HOUR
TRAFFIC VOLUMES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MATSONFORD ROAD
OFFICE PARK DRIVEWAY
201 KING OF PRUSSIA DRIVEWAY
KING OF PRUSSIA ROAD
KING OF PRUSSIA ROAD
RADNOR CHESTER ROAD
RADNOR PLAZA DRIVEWAY
250 OFFICE LOOP ROAD
250 OFFICE LOOP ROAD
RADNOR CHESTER ROAD
RAIDER ROAD
OFFICE PARK DRIVEWAY
MAIN LINE HEALTH DRIVEWAY
RAIDER ROAD
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FIGURE D-4
250 KING OF PRUSSIA ROAD DEVELOPMENT
WEEKDAY PM PEAK HOUR
TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

MIXED MEDICAL FACILITY

145 King of Prussia Road
Radnor Township
Delaware County, Pennsylvania

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Prepared For:

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September 2017
Revised January 2018
Revised April 2018
UPHS 1507

EXECUTIVE SUMMARY

This document summarizes the results of an evaluation of traffic impacts associated with the proposed University of Pennsylvania Health Systems site located at 145 King of Prussia Road in Radnor Township, Delaware County, Pennsylvania.

The site currently is vacated and located on the east side of King of Prussia Road between the existing Southern driveway and existing Septa/Northern driveway. The proposed site will be comprised of a 250,000 square foot mixed medical use building, a 150,000 square foot general office building, and a 75,000 square foot, 120 room hotel. The proposed development is anticipated to be constructed and occupied by 2020.

Turning movement counts, including heavy vehicles and pedestrian counts, were conducted between the hours of 7:00 – 9:00A.M.and 4:00 – 6:00 P.M. at the following intersections:

1. King of Prussia Road & Matsonford Road (SR 1038) – November 18, 2015
2. King of Prussia Road & Radnor Chester Road (SR 1021) – April 27, 2016
3. King of Prussia Road & SEPTA Station Driveway– September 15, 2016
4. King of Prussia Road & Existing Northern Site Driveway – April 27, 2016
5. King of Prussia Road & Existing Raider Road/Site Driveway – November 18, 2015
6. King of Prussia Road & Existing Southern Site Driveway – April 27, 2016
7. Lancaster Avenue (SR 0030) & King of Prussia Road/I-476 NB Off Ramp– November 18, 2015
8. Lancaster Avenue (SR 0030) & I-476 SB On/Off Ramps – September 15, 2016
9. Lancaster Avenue (SR 0030) & I-476 NB On Ramp Hillside Circle – November 18, 2015
10. Lancaster Avenue (SR 0030) & Radnor Chester Road (SR 1021) – April 27, 2016

The performance of the study intersections was evaluated under existing, no-build, and build conditions through a qualitative measure of operating conditions called Levels of Service. Levels of Service (LOS) are determined through analysis procedures outlined in the 2010 Highway Capacity Manual (Transportation Research Board, Washington, D.C.). The Levels of Service were obtained using *Synchro 9* and the 2016 existing, 2020 no-build, and 2020 build conditions and were evaluated to identify impacts to the study area. The need for additional mitigations is based on the LOS requirements identified in the PennDOT's *Policies and Procedures for Traffic Impact Studies.*

As the existing space was previously approved and could be occupied by a tenant without additional approvals, trips for the existing site were calculated and applied to the existing traffic to develop the future "no build" conditions. The traffic volumes for the existing site were estimated based on information contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation* (9th Edition, 2012). The existing site trips are based upon the ITE Land Use Codes 710 "General Office" utilizing the square footage of the building as the independent variable. The trip calculations result in a total of 611 (538 entering and 73 exiting) and 557 (95 entering and 462 exiting) new trips generated by the site during the morning and afternoon peak hours, respectively.

The proposed mixed-use site will be located at 145 King of Prussia Road between the existing Southern Driveway and the shared SEPTA/Site Driveway. The proposed site will have three driveways along King of Prussia Drive at the location of the of the existing entry driveways. The existing driveway across from Raider Road will become a full access driveway. The southern driveway will primarily be for accessing the loading area.

The traffic volumes for the hotel and general office components of the proposed site were estimated based on information contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation* (9th Edition, 2012). The *ITE Trip Generation Manual* defines a trip as a "single or one-direction vehicle movement with either the origin or the destination (exiting or entering) inside a study site."

The proposed Penn Medicine mixed medical use portion of the development will have a gross floor area of 250,000 SF, more than triple the size of 90% of the facilities used by ITE to derive trip generation data. Also, unlike private physician practices used to generate the ITE rates, the proposed Penn Medicine mixed medical use facility will include several treatment facilities that are uncommon in a typical medical office and that occupy a larger portion of the gross square floor area of the building, while not accommodating a larger number of patients. These facilities include ambulatory operating rooms, endoscopy rooms, chemotherapy treatment areas, radiological imaging rooms and radiation oncology treatment areas. Therefore, the proposed facility is very different from those used to derive ITE trip generation data. It is for these reasons that the ITE trip generation is not appropriate to use for the proposed Penn Medicine building and a trip generation rate was developed based on an evaluation of three existing mixed medical use facilities for the peak hour of the adjacent street which, based on traffic counts, is 7:15-8:15 AM and 5:00–6:00 PM.

The following existing mixed medical use facilities were evaluated to develop trip generation rates:

- 171,000 square foot facility at 250 King of Prussia Rd in Radnor PA
- 83,000 square foot facility at 1001 Chesterbrook Blvd. in Berwyn PA
- 154,826 square foot facility at 915 Old Fern Hill Road in West Chester, PA

Based on driveway counts and data regarding the number of patient positions at each facility, average weekday, AM and PM trip generation rates and entry/exit distributions were developed and presented to Radnor Township for review and approval.

The trip calculations result in a total of 731 (577 entering and 154 exiting) and 583 (158 entering and 425 exiting) new trips generated to the site during the morning and afternoon peak hours, respectively. The proposed site will generate approximately 90% more net trips over the course of a whole day than the existing land use "general office building" but only generates approximately 20% more net trips in the AM peak period and approximately 5% more net trips during the PM peak period.

An analysis was conducted to determine whether left turn lanes or a right turn lane into the site from are warranted. Based on the standard worksheets in the Chapter 11 Appendix of PennDOT Publication 46, the warrants for left turn lanes on King of Prussia Road and a northbound right turn lane into the site at the intersection of King of Prussia Road and Raider Road/Site Driveway are met, along with a southbound left turn lane from King of Prussia Road into the Septa Station Driveway.

Traffic Signal warrant requirements were evaluated at the unsignalized intersections of King of Prussia Road & Raider Road/Site Driveway and King of Prussia Road & Septa Station Driveway using the manual counts and generated site trips. From the signal warrant analysis, it was determined that the 4-Hour and Peak Hour signal warrants were satisfied at the intersection of King of Prussia Road & Raider Road/Site Driveway. Evaluation of the left turn signalization warrants for the northbound and southbound left turn lanes on King of Prussia Road at Raider Road and the proposed site driveway indicate that the left turn movements from King of Prussia Road should be controlled with permitted phases.

Vehicular and pedestrian clearances were calculated for the proposed signal at King of Prussia Road and Raider Road/site driveway based on PennDOT policies.

Operations of the study intersections during the AM and PM peak hours were evaluated for the build configuration of the proposed development in the proposed build year of 2020 and the horizon year of 2025 with the optimized timings from the no-build condition.

Under the 2020 and 2025 no-build configuration, all the study intersections operate at an acceptable LOS D or better except for the following locations:

<u>King of Prussia Road & Radnor-Chester Road (SR 1021)</u>

- In 2020 the overall intersection operates at a LOS F (218.9 seconds of delay) during the AM peak hour and LOS F (85.7 seconds of delay) during the PM peak hour.
- In 2025 the overall intersection operates at a LOS F (227.1 seconds of delay) during the AM peak hour and LOS F (88.4 seconds of delay) during the PM peak hour.

King of Prussia Road & South Site Driveway

- In 2020 the overall intersection operates at a LOS F (83.9 seconds of delay) during the PM peak hour.
- In 2025 the overall intersection operates at a LOS F (87.3 seconds of delay) during the PM peak hour.

Lancaster Avenue (SR 0030) & I-476 NB Off Ramps/King of Prussia Road

- In 2020 the overall intersection operates at a LOS E (66.2 seconds of delay) during the AM peak hour and LOS E (55.6 seconds of delay) during the PM peak hour.
- In 2025 the overall intersection operates at a LOS E (69.4 seconds of delay) during the AM peak hour and LOS E (60.5 seconds of delay) during the PM peak hour.

Lancaster Avenue (SR 0030) & Radnor Chester Road

- Overall Intersection operates at a LOS E (57.2 seconds of delay) during the PM peak hour in 2020.
- Overall Intersection operates at a LOS E (62.1 seconds of delay) during the PM peak hour in 2025.

Based on the anticipated Level of Service for the exiting movements from the site via the SEPTA Driveway and south site driveway to King of Prussia Road a gap study was performed at both locations. The gap study was conducted from 7:00-9:00 AM and 4:00-6:00 PM on April 27, 2016. Based on the peak hour gap analysis, it is anticipated that sufficient gaps are available to accommodate the anticipated traffic from the site at the two locations.

As required by 255-20.B(5)(d)(6)(a) of the Radnor Township Subdivision and Land Development Ordinance, additional off-site improvements would be necessary to achieve LOS C at all of the off-site intersections. Based on Synchro analysis, Lancaster Avenue would require significant intersection upgrades including widening to provide additional through lanes and providing additional dedicated turn lanes on most approaches. The King of Prussia Road intersections at Radnor-Chester Road and Matsonford Road would require two through lanes in each direction on King of Prussia Road and dual turn lanes on the minor approaches. Due to physical constraints at most of the project intersections, including the SEPTA Rail Bridge on King of Prussia Road and the I-476 Bridges on Lancaster Avenue, the necessary improvements are not feasible and are not proposed by the applicant.

The Intersection LOS and delay under no-build conditions was compared to the 2020 and 2025 build conditions. The comparison indicated that there are no changes in overall intersection LOS at existing signalized intersections between the no-build and build conditions because of the trips generated by the proposed site. In conjunction with the proposed development the following roadway improvements are recommended:

- At King of Prussia Road and Matsonford Road/Park Driveway:
  - Modify AM signal timings to shift 3 seconds from the SB King of Prussia Road lead phase to the NB/SB King of Prussia phase (1 second) and the EB/WB Matsonford Road/Park Driveway Phase (2 seconds).
- At King of Prussia Road and Radnor-Chester Road:
  - Modify PM signal timings to shift 6 seconds from the EB/WB King of Prussia Road phase to the NB/SB Radnor Chester Road phase.
- At King of Prussia Road and Septa Station Driveway:
  - Restripe southbound King of Prussia Road to provide a dedicated left turn lane.
- At King of Prussia Road and Raider Road/Site Driveway:
  - Provide left turn lanes on both approaches of King of Prussia Road
  - Widen the east side of King of Prussia Road to provide two continuous northbound lanes from Lancaster Avenue to the signalized intersection at the Main Site Driveway/ Raider Road.
  - Install an actuated traffic signal coordinated with the signal at King of Prussia Road & Radnor-Chester Road.
- At King of Prussia Road and South Site Driveway:
  - Restripe northbound King of Prussia Road to provide shared through/right turn lane.

  - Widen the east side of King of Prussia Road to provide two continuous northbound lanes from the south driveway to the Main Site Driveway/ Raider Road, with a transition into a dedicated right turn lane.

- At Lancaster Avenue and NB Off Ramps/King of Prussia Road:
  - Restripe northbound I-76 off-ramp at Lancaster Avenue to provide shared through/right turn lane
- At Lancaster Avenue and I-476 SB Off Ramp:
  - Modify PM signal timings to shift 1 second from the EB/WB Lancaster Avenue phase to the WB Lancaster Avenue lead phase.
- At Lancaster Avenue and I-476 NB On Ramp/Hillside Circuit:
  - Modify PM signal timings to shift 7 second from the EB/WB Lancaster Avenue phase to the EB Lancaster Avenue lead phase.
- At Lancaster Avenue and Radnor-Chester Road:
  - Modify AM signal timings to shift 12 seconds from the southbound Radnor-Chester Road lead phase and 1 second from the Lancaster Avenue Phase lead left phase to the EB/WB Lancaster Avenue EB/WB Phase.

The additional improvements result in the overall intersection LOS at Lancaster Avenue and I-476 NB Off Ramp/King of Prussia Road improving from LOS E to LOS D during the AM peak hour in both 2020 and 2025. Striping the additional NB thru lane improves the approach from LOS E to LOS D and the through movement from LOS F to LOS E during the AM peak hour in 2020 and 2025.

Under the build Conditions with the identified improvements implemented, all the study intersections maintain existing levels of service between the no-build and build conditions and operate at overall LOS D or better except for those that operate at LOS E or F under no-build conditions and the Raider Road intersection which operates at A LOS E during the PM peak hour.

Based on the comparison of the Intersection LOS and delay under no-build conditions and build conditions with the identified mitigation measures, the intersections meet the LOS requirements identified in the PennDOT's *Policies and Procedures for Traffic Impact Studies* at all the study intersections. The Levels of Service exhibited are not a result of, nor is the need for additional mitigation measures triggered as a result of the trips generated by the proposed site.

In addition to the improvements identified within the is TIS, a bus shelter is to be constructed on King of Prussia Road southeast of the SEPTA Driveway to the extent that it is approved by SEPTA and the University of Pennsylvania Health System will partner with the Township to install a Traffic Adaptive Signal Coordination at the following intersections, subject to PennDOT review:

- Route 30 & I-476 Northbound Ramps
- Route 30 & I-476/King of Prussia Road
- Route 30 & I-476 Southbound Ramps.
- Route 30 & Radnor-Chester Road.
- Route 30 & Radnor Financial Center Eastern Driveway
- Route 30 & Radnor Financial Center Western Driveway
- King of Prussia Road & Radnor-Chester Road.
- King of Prussia Road & Matsonford Road.
- Matsonford Road & South Centennial Drive.
- Matsonford Road & North Centennial Drive
- King of Prussia Road & Raider Road.
- Radnor Chester and Raider Road
- Radnor Chester and Radnor Financial Center

Appendix E

Volume Development Printouts

TPD# BRS.00010
4/21/2021
Traffic Volumes Worksheet

Intersection:	**King of Prussia Road & Radnor Chester Road/Office Park Driveway**									
Synchro Node:	**1**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2020 Existing Counts	**38**	**387**	**467**	**27**	**819**	**7**	**502**	**32**	**57**	**2**	**1**	**6**	**2345**
Balancing													0
2020 Existing Volumes (Balanced)	**38**	**387**	**467**	**27**	**819**	**7**	**502**	**32**	**57**	**2**	**1**	**6**	**2345**
Base growth (0.00% compounded for 3 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility		133		3	35				12				183
250 King of Prussia Road		75	72		18		17						182
													0
2023 Base (No-Build) Volumes	**38**	**595**	**539**	**30**	**872**	**7**	**519**	**32**	**69**	**2**	**1**	**6**	**2710**
Parking Garage Redistribution		58	-58		14		-14						0
													0
Total Trip Distribution	**0**	**58**	**-58**	**0**	**14**	**0**	**-14**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**38**	**653**	**481**	**30**	**886**	**7**	**506**	**32**	**69**	**2**	**1**	**6**	**2710**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2020 Existing Counts	**8**	**738**	**664**	**59**	**428**	**1**	**401**	**7**	**141**	**31**	**37**	**49**	**2564**
Balancing													0
2020 Existing Volumes (Balanced)	**8**	**738**	**664**	**59**	**428**	**1**	**401**	**7**	**141**	**31**	**37**	**49**	**2564**
Base growth (0.00% compounded for 3 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility		36		9	98				3				146
250 King of Prussia Road		30	29		77		74						210
0													0
2023 Base (No-Build) Volumes	**8**	**804**	**693**	**68**	**603**	**1**	**475**	**7**	**144**	**31**	**37**	**49**	**2920**
Parking Garage Redistribution		23	-23		59		-59						0
0													0
Total Trip Distribution	**0**	**23**	**-23**	**0**	**59**	**0**	**-59**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**8**	**827**	**670**	**68**	**662**	**1**	**416**	**7**	**144**	**31**	**37**	**49**	**2920**

TPD# BRS.00010
4/21/2021
Traffic Volumes Worksheet

Intersection:	**Main Line Health Driveway/Raider Road & Radnor Chester Road**									
Synchro Node:	**2**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2021 Existing Counts	**5**	**0**	**15**	**67**	**0**	**1**	**59**	**267**	**220**	**33**	**277**	**1**	**945**
Covid Adjustment	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	15
2021 Existing Volumes (Balanced)	**6**	**0**	**19**	**85**	**0**	**1**	**75**	**339**	**279**	**42**	**352**	**1**	**1200**
Base growth (0.00% compounded for 2 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility								12			3		15
250 King of Prussia Road								55			14		70
													0
2023 Base (No-Build) Volumes	**6**	**0**	**19**	**85**	**0**	**1**	**75**	**406**	**279**	**42**	**369**	**1**	**1285**
Parking Garage Redistribution													0
													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**6**	**0**	**19**	**85**	**0**	**1**	**75**	**406**	**279**	**42**	**369**	**1**	**1285**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2021 Existing Counts	**22**	**0**	**50**	**61**	**0**	**4**	**20**	**216**	**58**	**9**	**440**	**2**	**882**
Covid Adjustment	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	17
2021 Existing Volumes (Balanced)	**30**	**0**	**69**	**84**	**0**	**6**	**28**	**298**	**80**	**12**	**607**	**3**	**1217**
Base growth (0.00% compounded for 2 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility								3			9		12
250 King of Prussia Road								22			62		84
0													0
2023 Base (No-Build) Volumes	**30**	**0**	**69**	**84**	**0**	**6**	**28**	**323**	**80**	**12**	**678**	**3**	**1313**
Parking Garage Redistribution													0
0													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**30**	**0**	**69**	**84**	**0**	**6**	**28**	**323**	**80**	**12**	**678**	**3**	**1313**

TPD# BRS.00010
4/21/2021
Traffic Volumes Worksheet

Intersection:	**King of Prussia Road & Matsonford Road/Radnor Plaza Driveway**									
Synchro Node:	**3**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2020 Existing Counts	**368**	**623**	**2**	**12**	**614**	**593**	**1**	**0**	**2**	**311**	**7**	**102**	**2635**
Balancing													0
2020 Existing Volumes (Balanced)	**368**	**623**	**2**	**12**	**614**	**593**	**1**	**0**	**2**	**311**	**7**	**102**	**2635**
Base growth (0.00% compounded for 3 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility		87			23	12				46			168
250 King of Prussia Road		86			19	16				61			182
													0
2023 Base (No-Build) Volumes	**368**	**796**	**2**	**12**	**656**	**621**	**1**	**0**	**2**	**418**	**7**	**102**	**2985**
Parking Garage Redistribution													0
													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**368**	**796**	**2**	**12**	**656**	**621**	**1**	**0**	**2**	**418**	**7**	**102**	**2985**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2020 Existing Counts	**120**	**744**	**1**	**7**	**500**	**272**	**3**	**4**	**9**	**528**	**1**	**216**	**2405**
Balancing													0
2020 Existing Volumes (Balanced)	**120**	**744**	**1**	**7**	**500**	**272**	**3**	**4**	**9**	**528**	**1**	**216**	**2405**
Base growth (0.00% compounded for 3 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility		24			64	34				12			134
250 King of Prussia Road		35			83	68				24			211
0													0
2023 Base (No-Build) Volumes	**120**	**803**	**1**	**7**	**647**	**374**	**3**	**4**	**9**	**564**	**1**	**216**	**2750**
Parking Garage Redistribution													0
0													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**120**	**803**	**1**	**7**	**647**	**374**	**3**	**4**	**9**	**564**	**1**	**216**	**2750**

TPD# BRS.00010
4/21/2021
Traffic Volumes Worksheet

Intersection:	**Raider Road/Medical Office Driveway & King of Prussia Road**									
Synchro Node:	**4**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2020 Existing Counts	**9**	**0**	**130**	**0**	**0**	**0**	**173**	**1134**	**27**	**27**	**318**	**58**	**1876**
Balancing													0
2020 Existing Volumes (Balanced)	**9**	**0**	**130**	**0**	**0**	**0**	**173**	**1134**	**27**	**27**	**318**	**58**	**1876**
Base growth (0.00% compounded for 3 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility				99		22		59	369	52	21		622
250 King of Prussia Road								75			23		98
													0
2023 Base (No-Build) Volumes	**9**	**0**	**130**	**99**	**0**	**22**	**173**	**1268**	**396**	**79**	**362**	**58**	**2596**
Parking Garage Redistribution													0
													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**9**	**0**	**130**	**99**	**0**	**22**	**173**	**1268**	**396**	**79**	**362**	**58**	**2596**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2020 Existing Counts	**5**	**0**	**41**	**0**	**0**	**0**	**23**	**344**	**5**	**5**	**1201**	**5**	**1629**
Balancing													0
2020 Existing Volumes (Balanced)	**5**	**0**	**41**	**0**	**0**	**0**	**23**	**344**	**5**	**5**	**1201**	**5**	**1629**
Base growth (0.00% compounded for 3 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility				272		60		20	101	14	44		511
250 King of Prussia Road								30			96		126
0													0
2023 Base (No-Build) Volumes	**5**	**0**	**41**	**272**	**0**	**60**	**23**	**394**	**106**	**19**	**1341**	**5**	**2266**
Parking Garage Redistribution													0
0													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2023 Projected (Build) Volumes	**5**	**0**	**41**	**272**	**0**	**60**	**23**	**394**	**106**	**19**	**1341**	**5**	**2266**

TPD# BRS.00010
4/21/2021
Traffic Volumes Worksheet

Intersection:	**King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway**									
Synchro Node:	**5**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2021 Existing Counts	**2**	**310**	**6**	**17**	**515**	**11**	**5**	**0**	**4**	**1**	**0**	**0**	**871**
Covid Adjustment	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	15
2021 Existing Volumes (Balanced)	**3**	**394**	**8**	**22**	**654**	**14**	**6**	**0**	**5**	**1**	**0**	**0**	**1106**
Base growth (0.00% compounded for 2 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility		145			38								183
250 King of Prussia Road			75	75			18		23				191
													0
2023 Base (No-Build) Volumes	**3**	**539**	**82**	**96**	**692**	**14**	**24**	**0**	**28**	**1**	**0**	**0**	**1480**
Parking Garage Redistribution			58				14						72
													0
Total Trip Distribution	**0**	**0**	**58**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**72**
2023 Projected (Build) Volumes	**3**	**539**	**141**	**96**	**692**	**14**	**38**	**0**	**28**	**1**	**0**	**0**	**1552**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2021 Existing Counts	**1**	**339**	**4**	**4**	**499**	**7**	**3**	**0**	**11**	**13**	**0**	**3**	**884**
Covid Adjustment	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	17
2021 Existing Volumes (Balanced)	**1**	**468**	**6**	**6**	**689**	**10**	**4**	**0**	**15**	**18**	**0**	**4**	**1220**
Base growth (0.00% compounded for 2 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility		39			107								146
250 King of Prussia Road			30	30			77		96				233
0													0
2023 Base (No-Build) Volumes	**1**	**507**	**35**	**35**	**796**	**10**	**81**	**0**	**111**	**18**	**0**	**4**	**1599**
Parking Garage Redistribution			23				59						82
0													0
Total Trip Distribution	**0**	**0**	**23**	**0**	**0**	**0**	**59**	**0**	**0**	**0**	**0**	**0**	**82**
2023 Projected (Build) Volumes	**1**	**507**	**59**	**35**	**796**	**10**	**140**	**0**	**111**	**18**	**0**	**4**	**1681**

TPD# BRS.00010
4/21/2021
Traffic Volumes Worksheet

Intersection:	**250 Office Loop Road & Radnor Chester Road**									
Synchro Node:	**6**	**Adjacent intersections:**	**West**	**0**	**East**	**0**	**North**	**0**	**South**	**0**

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2021 Existing Counts	**0**	**0**	**0**	**5**	**0**	**2**	**0**	**325**	**16**	**7**	**327**	**0**	**682**
Covid Adjustment	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	15
2021 Existing Volumes (Balanced)	**0**	**0**	**0**	**6**	**0**	**3**	**0**	**413**	**20**	**9**	**415**	**0**	**866**
Base growth (0.00% compounded for 2 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility								12			3		15
250 King of Prussia Road				14		17			55	72			159
													0
2023 Base (No-Build) Volumes	**0**	**0**	**0**	**21**	**0**	**20**	**0**	**425**	**76**	**81**	**418**	**0**	**1040**
Parking Garage Redistribution						-14				-58			-72
													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**-14**	**0**	**0**	**0**	**-58**	**0**	**0**	**-72**
2023 Projected (Build) Volumes	**0**	**0**	**0**	**21**	**0**	**6**	**0**	**425**	**76**	**23**	**418**	**0**	**968**

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	Volume
2021 Existing Counts	**0**	**0**	**0**	**10**	**0**	**5**	**0**	**261**	**5**	**4**	**432**	**0**	**717**
Covid Adjustment	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	17
2021 Existing Volumes (Balanced)	**0**	**0**	**0**	**14**	**0**	**7**	**0**	**360**	**7**	**6**	**596**	**0**	**989**
Base growth (0.00% compounded for 2 yrs)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mix-Use Medical Facility								3			9		12
250 King of Prussia Road				62		74			22	29			187
0													0
2023 Base (No-Build) Volumes	**0**	**0**	**0**	**76**	**0**	**81**	**0**	**363**	**29**	**34**	**605**	**0**	**1188**
Parking Garage Redistribution						-59				-23			-82
0													0
Total Trip Distribution	**0**	**0**	**0**	**0**	**0**	**-59**	**0**	**0**	**0**	**-23**	**0**	**0**	**-82**
2023 Projected (Build) Volumes	**0**	**0**	**0**	**76**	**0**	**22**	**0**	**363**	**29**	**11**	**605**	**0**	**1106**

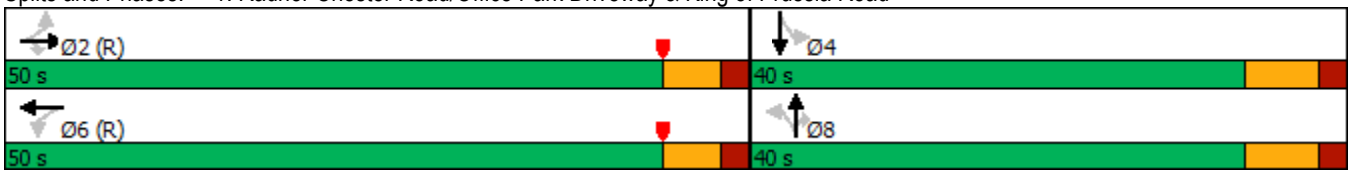
Appendix F

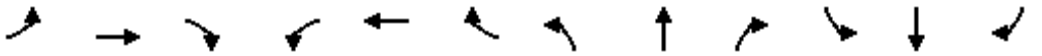
Capacity Analysis & Critical and Follow-Up Headway Calculations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	387	467	27	819	7	502	32	57	2	1	6
Future Volume (vph)	38	387	467	27	819	7	502	32	57	2	1	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	10	11	11	10	10	14	12	12	12
Grade (%)		-1%			2%			-1%			-6%	
Storage Length (ft)	75		125	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	75			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		336			663			452			303	
Travel Time (s)		6.5			12.9			8.8			8.3	
Confl. Peds. (#/hr)	3					3			19	19		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	5%	3%	8%	2%	2%	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Detector Phase	2	2	2	6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0		33.0	33.0	33.0	33.0	33.0	
Total Split (s)	50.0	50.0	50.0	50.0	50.0		40.0	40.0	40.0	40.0	40.0	
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%		44.4%	44.4%	44.4%	44.4%	44.4%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 74 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Radnor Chester Road/Office Park Driveway & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	387	467	27	819	7	502	32	57	2	1	6
Future Volume (veh/h)	38	387	467	27	819	7	502	32	57	2	1	6
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		0.97	1.00		0.97
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	1837	1766	1866	1665	1750	1750	1837	1837	1896	2024	2024	2024
Adj Flow Rate, veh/h	40	412	0	29	871	7	534	34	42	2	1	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	5	3	8	2	2	0	0	1	0	0	0
Cap, veh/h	84	883		398	867	7	260	12	592	50	44	74
Arrive On Green	0.50	0.50	0.00	0.34	0.34	0.34	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	655	1766	1582	915	1733	14	484	31	1566	0	117	196
Grp Volume(v), veh/h	40	412	0	29	0	878	568	0	42	8	0	0
Grp Sat Flow(s),veh/h/ln	655	1766	1582	915	0	1747	514	0	1566	313	0	0
Q Serve(g_s), s	0.5	13.7	0.0	2.2	0.0	45.0	0.0	0.0	1.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	45.0	13.7	0.0	15.9	0.0	45.0	34.0	0.0	1.5	34.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.94		1.00	0.25		0.62
Lane Grp Cap(c), veh/h	84	883		398	0	874	272	0	592	168	0	0
V/C Ratio(X)	0.48	0.47		0.07	0.00	1.01	2.09	0.00	0.07	0.05	0.00	0.00
Avail Cap(c_a), veh/h	84	883		398	0	874	272	0	592	168	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.0	14.7	0.0	25.6	0.0	29.9	32.9	0.0	17.9	21.9	0.0	0.0
Incr Delay (d2), s/veh	18.3	1.8	0.0	0.4	0.0	31.7	502.4	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	9.3	0.0	1.0	0.0	35.4	73.8	0.0	1.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	16.4	0.0	26.0	0.0	61.6	535.2	0.0	18.0	22.0	0.0	0.0
LnGrp LOS	E	B		C	A	F	F	A	B	C	A	A
Approach Vol, veh/h		452	A		907			610			8	
Approach Delay, s/veh		20.6			60.5			499.6			22.0	
Approach LOS		C			E			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		40.0		50.0		40.0				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		44.0		33.0		44.0		33.0				
Max Q Clear Time (g_c+I1), s		47.5		36.0		47.0		36.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			186.7									
HCM 6th LOS			F									

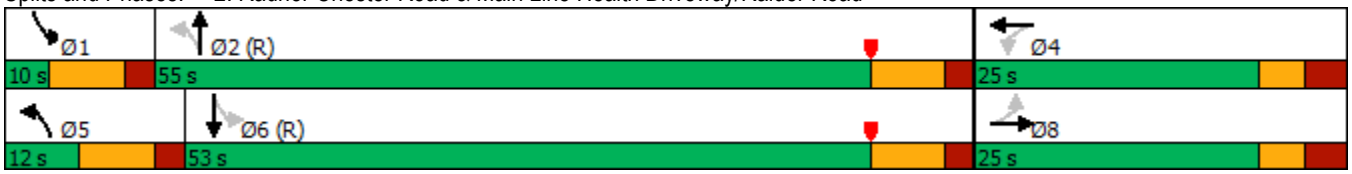
Notes

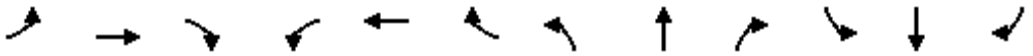
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	19	85	0	1	75	339	279	42	352	1
Future Volume (vph)	6	0	19	85	0	1	75	339	279	42	352	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	11	13	13	11	13	13	11	11	11
Grade (%)		-2%			-2%			5%			-6%	
Storage Length (ft)	175		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			75			25			100		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		317			560			921			815	
Travel Time (s)		8.6			15.3			17.9			15.9	
Confl. Peds. (#/hr)			8	8			2		4	4		2
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	9%	0%	100%	0%	4%	5%	12%	3%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	45.0		10.0	45.0	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	55.0		10.0	53.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		13.3%	61.1%		11.1%	58.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 16 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Radnor Chester Road & Main Line Health Driveway/Raider Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	19	85	0	1	75	339	279	42	352	1
Future Volume (veh/h)	6	0	19	85	0	1	75	339	279	42	352	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.97		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1875	1875	1875	1747	1950	1950	1660	1669	1669	1853	1981	1981
Adj Flow Rate, veh/h	9	0	13	127	0	1	112	506	404	63	525	1
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Percent Heavy Veh, %	0	0	0	9	0	0	0	4	4	12	3	3
Cap, veh/h	294	0	227	275	0	236	672	533	425	209	1192	2
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.06	0.62	0.62	0.09	1.00	1.00
Sat Flow, veh/h	1457	0	1545	1344	0	1607	1581	858	685	1765	1976	4
Grp Volume(v), veh/h	9	0	13	127	0	1	112	0	910	63	0	526
Grp Sat Flow(s),veh/h/ln	1457	0	1545	1344	0	1607	1581	0	1543	1765	0	1980
Q Serve(g_s), s	0.5	0.0	0.7	8.0	0.0	0.0	2.3	0.0	49.1	1.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.7	8.2	0.0	0.0	2.3	0.0	49.1	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		0.00
Lane Grp Cap(c), veh/h	294	0	227	275	0	236	672	0	958	209	0	1194
V/C Ratio(X)	0.03	0.00	0.06	0.46	0.00	0.00	0.17	0.00	0.95	0.30	0.00	0.44
Avail Cap(c_a), veh/h	404	0	343	376	0	357	680	0	958	211	0	1194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	33.0	36.3	0.0	32.8	5.5	0.0	15.8	18.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	1.2	0.0	0.0	0.1	0.0	19.2	0.8	0.0	1.2
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	0.3	0.0	0.5	4.9	0.0	0.0	1.2	0.0	26.5	1.3	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	33.1	37.5	0.0	32.8	5.6	0.0	35.0	19.3	0.0	1.2
LnGrp LOS	C	A	C	D	A	C	A	A	C	B	A	A
Approach Vol, veh/h		22			128			1022			589	
Approach Delay, s/veh		33.1			37.5			31.8			3.1	
Approach LOS		C			D			C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	61.9		18.2	11.5	60.3		18.2				
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0				
Max Green Setting (Gmax), s	3.0	48.0		19.0	5.0	46.0		19.0				
Max Q Clear Time (g_c+I1), s	3.7	0.0		10.7	4.8	0.0		3.0				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	22.6	
HCM 6th LOS	C	

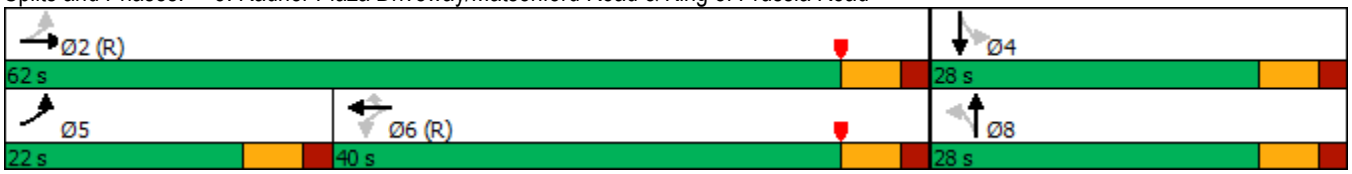
Notes

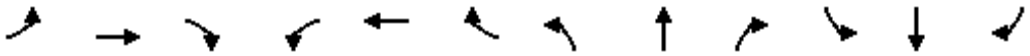
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	368	623	2	12	614	593	1	0	2	311	7	102
Future Volume (vph)	368	623	2	12	614	593	1	0	2	311	7	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	14	14	12	12	14	12	11	11	11	13	13
Grade (%)		2%			3%			6%			-2%	
Storage Length (ft)	100		0	115		285	0		0	350		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	175			50			25			275		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		469			884			278			1080	
Travel Time (s)		9.1			17.2			7.6			21.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	1%	1%	0%	1%	2%	0%	0%	0%	4%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	17.0		17.0	17.0	17.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	16.0	56.0		34.0	34.0	34.0	28.0	28.0		28.0	28.0	
Total Split (s)	22.0	62.0		40.0	40.0	40.0	28.0	28.0		28.0	28.0	
Total Split (%)	24.4%	68.9%		44.4%	44.4%	44.4%	31.1%	31.1%		31.1%	31.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-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	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Radnor Plaza Driveway/Matsonford Road & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	623	2	12	614	593	1	0	2	311	7	102
Future Volume (veh/h)	368	623	2	12	614	593	1	0	2	311	7	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1834	1834	1750	1736	1791	1599	1599	1599	1818	1950	1950
Adj Flow Rate, veh/h	409	692	2	13	682	0	1	0	2	346	8	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	1	1	0	1	2	0	0	0	4	0	0
Cap, veh/h	392	1158	3	368	675		354	0	346	451	48	381
Arrive On Green	0.19	0.63	0.63	0.39	0.39	0.00	0.26	0.00	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1653	1828	5	741	1736	1517	1200	0	1355	1451	189	1492
Grp Volume(v), veh/h	409	0	694	13	682	0	1	0	2	346	0	71
Grp Sat Flow(s),veh/h/ln	1653	0	1833	741	1736	1517	1200	0	1355	1451	0	1681
Q Serve(g_s), s	17.0	0.0	20.1	1.0	35.0	0.0	0.1	0.0	0.1	21.0	0.0	3.0
Cycle Q Clear(g_c), s	17.0	0.0	20.1	1.0	35.0	0.0	2.5	0.0	0.1	21.0	0.0	3.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	392	0	1161	368	675		354	0	346	451	0	430
V/C Ratio(X)	1.04	0.00	0.60	0.04	1.01		0.00	0.00	0.01	0.77	0.00	0.17
Avail Cap(c_a), veh/h	392	0	1161	368	675		354	0	346	451	0	430
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	9.7	17.1	27.5	0.0	26.8	0.0	25.0	32.7	0.0	26.0
Incr Delay (d2), s/veh	57.0	0.0	2.3	0.2	37.2	0.0	0.0	0.0	0.0	9.1	0.0	0.4
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	15.2	0.0	12.0	0.3	28.0	0.0	0.0	0.0	0.1	12.9	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.5	0.0	12.0	17.3	64.7	0.0	26.8	0.0	25.0	41.8	0.0	26.4
LnGrp LOS	F	A	B	B	F		C	A	C	D	A	C
Approach Vol, veh/h		1103			695	A		3			417	
Approach Delay, s/veh		38.9			63.8			25.6			39.2	
Approach LOS		D			E			C			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		62.0		28.0	22.0	40.0		28.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		56.0		22.0	16.0	34.0		22.0				
Max Q Clear Time (g_c+I1), s		22.1		23.5	19.5	37.5		5.0				
Green Ext Time (p_c), s		20.9		0.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			46.8									
HCM 6th LOS			D									

Notes

User approved pedestrian interval to be less than phase max green.

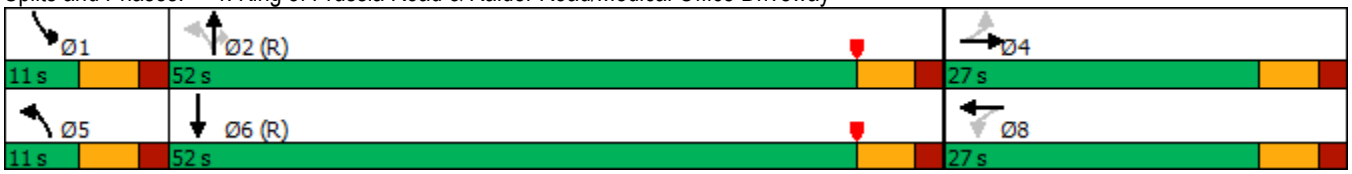
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

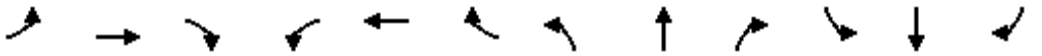
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	130	0	0	0	173	1134	27	27	318	58
Future Volume (vph)	9	0	130	0	0	0	173	1134	27	27	318	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	13	13	13	12	12	12	11	12	14	11	13	13
Grade (%)		-2%			-1%			-2%			0%	
Storage Length (ft)	0		0	115		0	250		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			100			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		265			338			428			1165	
Travel Time (s)		7.2			9.2			8.3			26.5	
Confl. Peds. (#/hr)							8					8
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	11%	0%	4%	0%	0%	0%	0%	2%	0%	0%	10%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm			pm+pt	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		3.0	28.0	28.0	3.0	28.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		11.0	46.0	46.0	11.0	46.0	
Total Split (s)	27.0	27.0		27.0	27.0		11.0	52.0	52.0	11.0	52.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		12.2%	57.8%	57.8%	12.2%	57.8%	
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	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 23 (26%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 4: King of Prussia Road & Raider Road/Medical Office Driveway

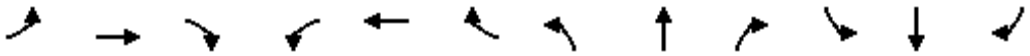




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	130	0	0	0	173	1134	27	27	318	58
Future Volume (veh/h)	9	0	130	0	0	0	173	1134	27	27	318	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	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	1950	1950	1950	1837	1837	1837	1875	1846	1950	1800	1726	1726
Adj Flow Rate, veh/h	12	0	167	0	0	0	222	1454	35	35	408	74
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	0	0	10	10
Cap, veh/h	51	7	217	80	258	0	663	1207	1073	67	889	161
Arrive On Green	0.14	0.00	0.14	0.00	0.00	0.00	0.07	0.65	0.65	0.04	0.63	0.63
Sat Flow, veh/h	60	51	1545	1263	1837	0	1785	1846	1642	1714	1420	258
Grp Volume(v), veh/h	179	0	0	0	0	0	222	1454	35	35	0	482
Grp Sat Flow(s),veh/h/ln	1656	0	0	1263	1837	0	1785	1846	1642	1714	0	1678
Q Serve(g_s), s	3.6	0.0	0.0	0.0	0.0	0.0	3.9	58.8	0.7	1.8	0.0	13.6
Cycle Q Clear(g_c), s	9.3	0.0	0.0	0.0	0.0	0.0	3.9	58.8	0.7	1.8	0.0	13.6
Prop In Lane	0.07		0.93	1.00		0.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	276	0	0	80	258	0	663	1207	1073	67	0	1050
V/C Ratio(X)	0.65	0.00	0.00	0.00	0.00	0.00	0.34	1.20	0.03	0.52	0.00	0.46
Avail Cap(c_a), veh/h	446	0	0	211	449	0	663	1207	1073	114	0	1050
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	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.2	0.0	0.0	0.0	0.0	0.0	6.1	15.6	5.5	42.4	0.0	8.8
Incr Delay (d2), s/veh	2.6	0.0	0.0	0.0	0.0	0.0	0.3	100.3	0.1	6.2	0.0	1.4
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	7.1	0.0	0.0	0.0	0.0	0.0	2.2	75.3	0.4	1.6	0.0	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	0.0	0.0	0.0	0.0	0.0	6.4	115.9	5.6	48.6	0.0	10.3
LnGrp LOS	D	A	A	A	A	A	A	F	A	D	A	B
Approach Vol, veh/h		179			0			1711			517	
Approach Delay, s/veh		39.8			0.0			99.4			12.9	
Approach LOS		D						F			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	63.8		17.7	11.0	61.3		17.7				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	46.0		21.0	5.0	46.0		21.0				
Max Q Clear Time (g_c+I1), s	4.3	61.3		11.3	6.4	15.6		0.0				
Green Ext Time (p_c), s	0.0	0.0		0.4	0.0	10.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			76.4									
HCM 6th LOS			E									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	394	8	22	654	14	6	0	5	1	0	0
Future Volume (vph)	3	394	8	22	654	14	6	0	5	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	12	10	12	12	12	12	12	15	15	15
Grade (%)		-4%			3%			-3%			-7%	
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		663			1165			255			210	
Travel Time (s)		12.9			22.7			7.0			5.7	
Confl. Peds. (#/hr)	3		1	1		3						
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	4%	9%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	394	8	22	654	14	6	0	5	1	0	0
Future Vol, veh/h	3	394	8	22	654	14	6	0	5	1	0	0
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-4	-	-	3	-	-	-3	-	-	-7	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	4	9	0	0	0	0	0	0
Mvmt Flow	3	428	9	24	711	15	7	0	5	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	729	0	0	438	0	0	1202	1212	429	1211	1214	722
Stage 1	-	-	-	-	-	-	435	435	-	770	770	-
Stage 2	-	-	-	-	-	-	767	777	-	441	444	-
Critical Hdwy	4.3	-	-	4.3	-	-	6.5	5.9	5.9	5.7	5.1	5.5
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	670	-	-	849	-	-	217	225	688	280	294	518
Stage 1	-	-	-	-	-	-	736	628	-	595	557	-
Stage 2	-	-	-	-	-	-	503	467	-	806	688	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	668	-	-	848	-	-	208	212	687	265	277	516
Mov Cap-2 Maneuver	-	-	-	-	-	-	208	212	-	265	277	-
Stage 1	-	-	-	-	-	-	731	624	-	589	528	-
Stage 2	-	-	-	-	-	-	479	443	-	795	683	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	17.2	18.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	208	687	668	-	-	848	-	-	265
HCM Lane V/C Ratio	0.031	0.008	0.005	-	-	0.028	-	-	0.004
HCM Control Delay (s)	22.9	10.3	10.4	0	-	9.4	0	-	18.6
HCM Lane LOS	C	B	B	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0.1	-	-	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	3	413	20	9	415
Future Volume (vph)	6	3	413	20	9	415
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	14	10	14	14
Grade (%)	1%		3%			1%
Storage Length (ft)	0	0		100	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Link Speed (mph)	25		35			35
Link Distance (ft)	241		815			452
Travel Time (s)	6.6		15.9			8.8
Confl. Peds. (#/hr)				89	89	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	20%	0%	3%	0%	0%	4%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	3	413	20	9	415
Future Vol, veh/h	6	3	413	20	9	415
Conflicting Peds, #/hr	0	0	0	89	89	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	1	-	3	-	-	1
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	20	0	3	0	0	4
Mvmt Flow	8	4	536	26	12	539

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1188	625	0	0	651	0
Stage 1	625	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Critical Hdwy	6.7	6.3	-	-	4.3	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.1	3.1	-	-	3	-
Pot Cap-1 Maneuver	203	503	-	-	714	-
Stage 1	549	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	175	446	-	-	633	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	576	-	-	-	-	-

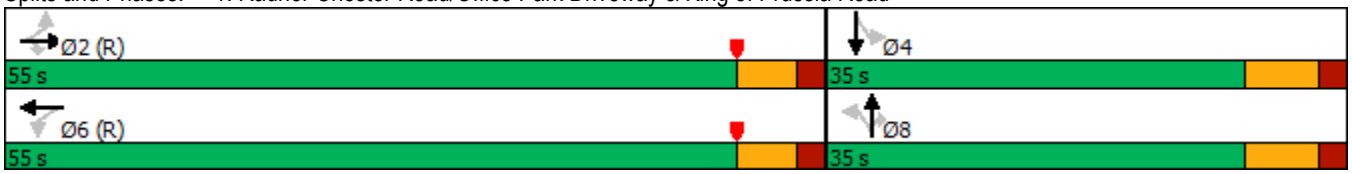
Approach	WB	NB	SB
HCM Control Delay, s	22.4	0	0.2
HCM LOS	C		

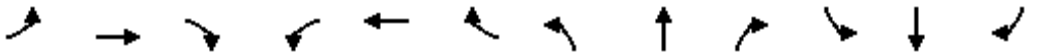
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	219	633	-
HCM Lane V/C Ratio	-	-	0.053	0.018	-
HCM Control Delay (s)	-	-	22.4	10.8	0
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	738	664	59	428	1	401	7	141	31	37	49
Future Volume (vph)	8	738	664	59	428	1	401	7	141	31	37	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	10	11	11	10	10	14	12	12	12
Grade (%)		-1%			2%			-1%			-6%	
Storage Length (ft)	75		125	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	75			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		336			663			452			303	
Travel Time (s)		6.5			12.9			8.8			8.3	
Confl. Peds. (#/hr)	11					11	1		22	22		1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	1%	1%	1%	14%	14%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Detector Phase	2	2	2	6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	49.0	49.0	49.0	49.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (s)	55.0	55.0	55.0	55.0	55.0		35.0	35.0	35.0	35.0	35.0	
Total Split (%)	61.1%	61.1%	61.1%	61.1%	61.1%		38.9%	38.9%	38.9%	38.9%	38.9%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 20 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Radnor Chester Road/Office Park Driveway & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	738	664	59	428	1	401	7	141	31	37	49
Future Volume (veh/h)	8	738	664	59	428	1	401	7	141	31	37	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.97	1.00		0.97	1.00		0.97
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	1823	1823	1911	1764	1764	1764	1638	1638	1896	1981	1981	1981
Adj Flow Rate, veh/h	8	761	0	61	441	1	413	7	93	32	38	35
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, %	1	1	0	1	1	1	14	14	1	3	3	3
Cap, veh/h	619	1013		246	977	2	248	3	500	52	62	31
Arrive On Green	0.56	0.56	0.00	1.00	1.00	1.00	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	970	1823	1619	702	1759	4	525	9	1552	0	192	96
Grp Volume(v), veh/h	8	761	0	61	0	442	420	0	93	105	0	0
Grp Sat Flow(s),veh/h/ln	970	1823	1619	702	0	1763	533	0	1552	289	0	0
Q Serve(g_s), s	0.3	28.7	0.0	5.3	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	28.7	0.0	34.0	0.0	0.0	29.0	0.0	3.9	29.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.98		1.00	0.30		0.33
Lane Grp Cap(c), veh/h	619	1013		246	0	979	251	0	500	145	0	0
V/C Ratio(X)	0.01	0.75		0.25	0.00	0.45	1.67	0.00	0.19	0.72	0.00	0.00
Avail Cap(c_a), veh/h	619	1013		246	0	979	251	0	500	145	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.0	15.3	0.0	9.7	0.0	0.0	35.1	0.0	22.0	25.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.1	0.0	2.4	0.0	1.5	319.2	0.0	0.2	16.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	17.5	0.0	1.4	0.0	0.7	45.9	0.0	2.5	4.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	20.4	0.0	12.1	0.0	1.5	354.2	0.0	22.2	41.4	0.0	0.0
LnGrp LOS	A	C		B	A	A	F	A	C	D	A	A
Approach Vol, veh/h		769	A		503			513			105	
Approach Delay, s/veh		20.3			2.8			294.0			41.4	
Approach LOS		C			A			F			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		35.0		55.0		35.0				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		49.0		28.0		49.0		28.0				
Max Q Clear Time (g_c+I1), s		31.2		31.0		36.5		31.0				
Green Ext Time (p_c), s		11.4		0.0		5.4		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			91.1									
HCM 6th LOS			F									

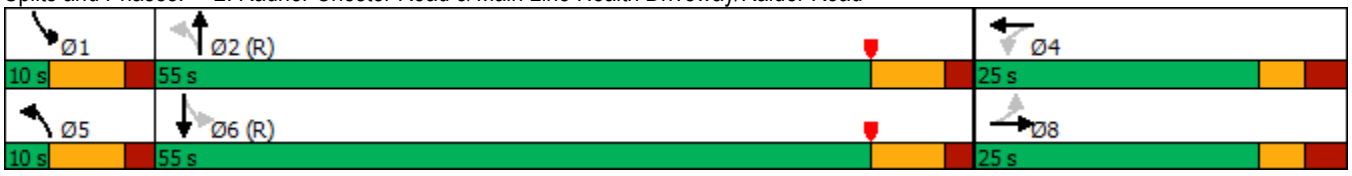
Notes

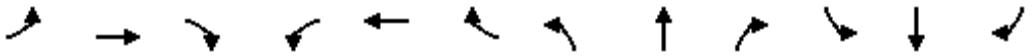
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	69	84	0	6	28	298	80	12	607	3
Future Volume (vph)	30	0	69	84	0	6	28	298	80	12	607	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	11	13	13	11	13	13	11	11	11
Grade (%)		-2%			-2%			5%			-6%	
Storage Length (ft)	175		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			75			25			100		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		317			560			921			815	
Travel Time (s)		8.6			15.3			17.9			15.9	
Confl. Peds. (#/hr)			1	1			3		1	1		3
Confl. Bikes (#/hr)									3			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	45.0		10.0	45.0	
Total Split (s)	25.0	25.0		25.0	25.0		10.0	55.0		10.0	55.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		11.1%	61.1%		11.1%	61.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 83 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Radnor Chester Road & Main Line Health Driveway/Raider Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	69	84	0	6	28	298	80	12	607	3
Future Volume (veh/h)	30	0	69	84	0	6	28	298	80	12	607	3
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		0.98	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	1875	1875	1875	1875	1950	1950	1660	1712	1712	2024	2009	2009
Adj Flow Rate, veh/h	32	0	45	90	0	6	30	320	76	13	653	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	1	0	1	1
Cap, veh/h	261	0	193	226	0	201	607	890	211	761	1322	4
Arrive On Green	0.12	0.00	0.12	0.12	0.00	0.12	0.03	0.67	0.67	0.04	1.00	1.00
Sat Flow, veh/h	1485	0	1582	1435	0	1645	1581	1330	316	1927	2002	6
Grp Volume(v), veh/h	32	0	45	90	0	6	30	0	396	13	0	655
Grp Sat Flow(s),veh/h/ln	1485	0	1582	1435	0	1645	1581	0	1646	1927	0	2008
Q Serve(g_s), s	1.7	0.0	2.3	5.4	0.0	0.3	0.5	0.0	9.4	0.2	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	2.3	7.2	0.0	0.3	0.5	0.0	9.4	0.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.00
Lane Grp Cap(c), veh/h	261	0	193	226	0	201	607	0	1101	761	0	1326
V/C Ratio(X)	0.12	0.00	0.23	0.40	0.00	0.03	0.05	0.00	0.36	0.02	0.00	0.49
Avail Cap(c_a), veh/h	410	0	352	370	0	366	631	0	1101	808	0	1326
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	35.7	38.7	0.0	34.8	4.4	0.0	6.5	4.9	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	1.1	0.0	0.1	0.0	0.0	0.9	0.0	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.0	1.7	3.5	0.0	0.2	0.3	0.0	5.4	0.1	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	0.0	36.3	39.9	0.0	34.9	4.5	0.0	7.4	4.9	0.0	1.3
LnGrp LOS	D	A	D	D	A	C	A	A	A	A	A	A
Approach Vol, veh/h		77			96			426			668	
Approach Delay, s/veh		36.0			39.5			7.2			1.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	66.2		16.0	8.6	65.4		16.0				
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0				
Max Green Setting (Gmax), s	3.0	48.0		19.0	3.0	48.0		19.0				
Max Q Clear Time (g_c+I1), s	2.7	0.0		9.7	3.0	0.0		4.3				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		8.3	
HCM 6th LOS		A	

Notes

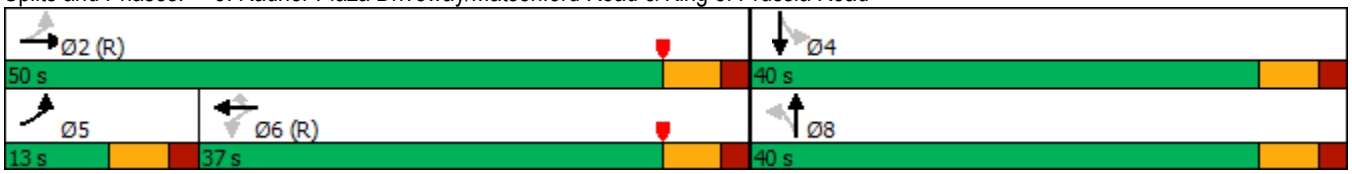
User approved pedestrian interval to be less than phase max green.

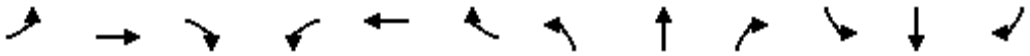
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	744	1	7	500	272	3	4	9	528	1	216
Future Volume (vph)	120	744	1	7	500	272	3	4	9	528	1	216
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	14	14	12	12	14	12	11	11	11	13	13
Grade (%)		2%			3%			6%			-2%	
Storage Length (ft)	100		0	115		285	0		0	350		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	175			50			25			275		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		469			884			278			1080	
Travel Time (s)		9.1			17.2			7.6			21.0	
Confl. Peds. (#/hr)			2	2					2	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	17.0		17.0	17.0	17.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	44.0		29.0	29.0	29.0	34.0	34.0		34.0	34.0	
Total Split (s)	13.0	50.0		37.0	37.0	37.0	40.0	40.0		40.0	40.0	
Total Split (%)	14.4%	55.6%		41.1%	41.1%	41.1%	44.4%	44.4%		44.4%	44.4%	
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	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 44 (49%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Radnor Plaza Driveway/Matsonford Road & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	744	1	7	500	272	3	4	9	528	1	216
Future Volume (veh/h)	120	744	1	7	500	272	3	4	9	528	1	216
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1778	1849	1849	1750	1750	1791	1599	1599	1599	1860	1950	1950
Adj Flow Rate, veh/h	130	809	1	8	543	0	3	4	10	574	1	158
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	2	0	0	0	1	0	0
Cap, veh/h	283	923	1	157	637		444	157	393	649	4	637
Arrive On Green	0.08	0.50	0.50	0.36	0.36	0.00	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1693	1846	2	665	1750	1517	1106	404	1010	1466	10	1639
Grp Volume(v), veh/h	130	0	810	8	543	0	3	0	14	574	0	159
Grp Sat Flow(s),veh/h/ln	1693	0	1848	665	1750	1517	1106	0	1414	1466	0	1649
Q Serve(g_s), s	4.0	0.0	35.1	1.0	25.7	0.0	0.2	0.0	0.5	35.0	0.0	5.9
Cycle Q Clear(g_c), s	4.0	0.0	35.1	23.4	25.7	0.0	5.5	0.0	0.5	35.0	0.0	5.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.71	1.00		0.99
Lane Grp Cap(c), veh/h	283	0	924	157	637		444	0	550	649	0	641
V/C Ratio(X)	0.46	0.00	0.88	0.05	0.85		0.01	0.00	0.03	0.88	0.00	0.25
Avail Cap(c_a), veh/h	298	0	924	157	637		444	0	550	649	0	641
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	20.0	35.6	26.4	0.0	20.3	0.0	17.0	27.7	0.0	18.6
Incr Delay (d2), s/veh	1.2	0.0	11.5	0.6	13.5	0.0	0.0	0.0	0.0	14.5	0.0	0.4
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	2.7	0.0	23.1	0.3	18.3	0.0	0.1	0.0	0.3	20.3	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	0.0	31.5	36.2	39.9	0.0	20.3	0.0	17.0	42.2	0.0	19.0
LnGrp LOS	B	A	C	D	D		C	A	B	D	A	B
Approach Vol, veh/h		940			551	A		17			733	
Approach Delay, s/veh		29.9			39.8			17.6			37.1	
Approach LOS		C			D			B			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		50.0		40.0	12.2	37.8		40.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		44.0		34.0	7.0	31.0		34.0				
Max Q Clear Time (g_c+I1), s		37.1		37.5	6.5	28.2		8.0				
Green Ext Time (p_c), s		6.0		0.0	0.0	2.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			34.6									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

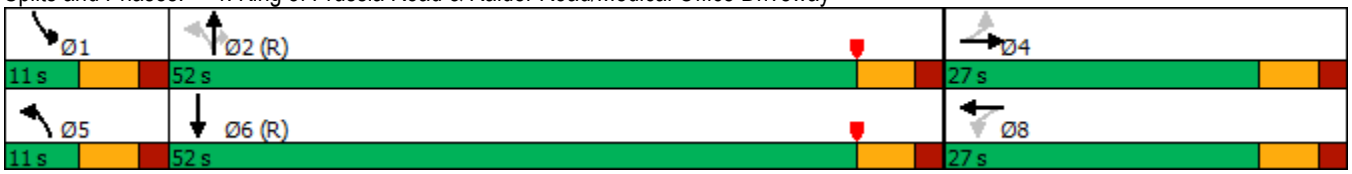
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

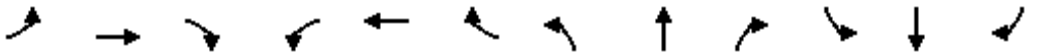
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	41	0	0	0	23	344	5	5	1201	5
Future Volume (vph)	5	0	41	0	0	0	23	344	5	5	1201	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	13	13	13	12	12	12	11	12	14	11	13	13
Grade (%)		-2%			-1%			-2%			0%	
Storage Length (ft)	0		0	115		0	250		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			100			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		265			338			428			1165	
Travel Time (s)		7.2			9.2			8.3			26.5	
Confl. Peds. (#/hr)							3					3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm			pm+pt	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		3.0	28.0	28.0	3.0	28.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		9.0	46.0	46.0	11.0	46.0	
Total Split (s)	27.0	27.0		27.0	27.0		11.0	52.0	52.0	11.0	52.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		12.2%	57.8%	57.8%	12.2%	57.8%	
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	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated

Splits and Phases: 4: King of Prussia Road & Raider Road/Medical Office Driveway

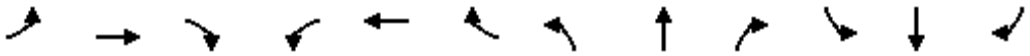




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	41	0	0	0	23	344	5	5	1201	5
Future Volume (veh/h)	5	0	41	0	0	0	23	344	5	5	1201	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1950	1950	1950	1837	1837	1837	1875	1860	1950	1800	1857	1857
Adj Flow Rate, veh/h	5	0	44	0	0	0	24	366	5	5	1278	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	0	0	1	1
Cap, veh/h	52	4	98	80	121	0	203	1399	1240	26	1370	5
Arrive On Green	0.07	0.00	0.07	0.00	0.00	0.00	0.03	0.75	0.75	0.02	0.74	0.74
Sat Flow, veh/h	113	55	1485	1413	1837	0	1785	1860	1649	1714	1849	7
Grp Volume(v), veh/h	49	0	0	0	0	0	24	366	5	5	0	1283
Grp Sat Flow(s),veh/h/ln	1654	0	0	1413	1837	0	1785	1860	1649	1714	0	1856
Q Serve(g_s), s	0.6	0.0	0.0	0.0	0.0	0.0	0.3	5.5	0.1	0.3	0.0	52.2
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.0	0.0	0.0	0.3	5.5	0.1	0.3	0.0	52.2
Prop In Lane	0.10		0.90	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	153	0	0	80	121	0	203	1399	1240	26	0	1376
V/C Ratio(X)	0.32	0.00	0.00	0.00	0.00	0.00	0.12	0.26	0.00	0.19	0.00	0.93
Avail Cap(c_a), veh/h	446	0	0	332	449	0	275	1399	1240	114	0	1376
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	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.4	0.0	0.0	0.0	0.0	0.0	18.1	3.4	2.8	43.8	0.0	9.8
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	3.6	0.0	12.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8	0.0	0.2	0.0	27.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.6	0.0	0.0	0.0	0.0	0.0	18.4	3.9	2.8	47.4	0.0	22.5
LnGrp LOS	D	A	A	A	A	A	B	A	A	D	A	C
Approach Vol, veh/h		49			0			395			1288	
Approach Delay, s/veh		41.6			0.0			4.8			22.6	
Approach LOS		D						A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	72.7		10.9	7.4	71.7		10.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	46.0		21.0	5.0	46.0		21.0				
Max Q Clear Time (g_c+I1), s	2.8	8.0		4.5	2.8	54.2		0.0				
Green Ext Time (p_c), s	0.0	7.4		0.1	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		19.1	
HCM 6th LOS		B	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	468	6	6	689	10	4	0	15	18	0	4
Future Volume (vph)	1	468	6	6	689	10	4	0	15	18	0	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	12	10	12	12	12	12	12	15	15	15
Grade (%)		-4%			3%			-3%			-7%	
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		663			1165			255			183	
Travel Time (s)		12.9			22.7			7.0			5.0	
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	8%	25%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	468	6	6	689	10	4	0	15	18	0	4
Future Vol, veh/h	1	468	6	6	689	10	4	0	15	18	0	4
Conflicting Peds, #/hr	1	0	1	1	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-4	-	-	3	-	-	-3	-	-	-7	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	8	25	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	538	7	7	792	11	5	0	17	21	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	804	0	0	546	0	0	1355	1359	539	1365	1361	799
Stage 1	-	-	-	-	-	-	541	541	-	813	813	-
Stage 2	-	-	-	-	-	-	814	818	-	552	548	-
Critical Hdwy	4.3	-	-	4.3	-	-	6.5	5.9	5.9	5.7	5.1	5.5
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	630	-	-	778	-	-	173	188	600	231	254	474
Stage 1	-	-	-	-	-	-	652	573	-	572	542	-
Stage 2	-	-	-	-	-	-	477	450	-	728	644	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	629	-	-	777	-	-	169	184	599	221	249	473
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	184	-	221	249	-
Stage 1	-	-	-	-	-	-	650	571	-	570	533	-
Stage 2	-	-	-	-	-	-	465	442	-	706	642	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	14.5	21.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	169	599	629	-	-	777	-	-	245
HCM Lane V/C Ratio	0.027	0.029	0.002	-	-	0.009	-	-	0.103
HCM Control Delay (s)	26.9	11.2	10.7	0	-	9.7	0	-	21.4
HCM Lane LOS	D	B	B	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	0.3

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	7	360	7	6	596
Future Volume (vph)	14	7	360	7	6	596
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	14	10	14	14
Grade (%)	1%		3%			1%
Storage Length (ft)	0	0		100	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Link Speed (mph)	25		35			35
Link Distance (ft)	241		815			452
Travel Time (s)	6.6		15.9			8.8
Confl. Peds. (#/hr)				1	1	
Confl. Bikes (#/hr)		1		1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	20%	1%	20%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	7	360	7	6	596
Future Vol, veh/h	14	7	360	7	6	596
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	1	-	3	-	-	1
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	20	1	20	0	1
Mvmt Flow	15	8	396	8	7	655

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1066	397	0	0	405	0
Stage 1	397	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.3	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3	3.2	-	-	3	-
Pot Cap-1 Maneuver	257	659	-	-	872	-
Stage 1	760	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	253	658	-	-	871	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	546	-	-	-	-	-

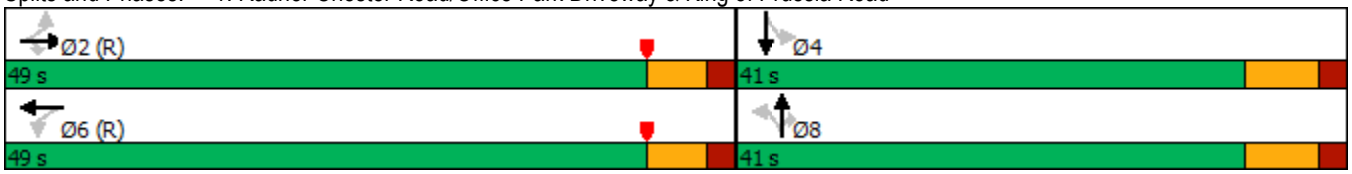
Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.1
HCM LOS	C		

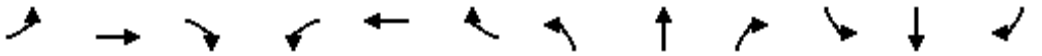
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	318	871	-
HCM Lane V/C Ratio	-	-	0.073	0.008	-
HCM Control Delay (s)	-	-	17.2	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	595	539	30	872	7	519	32	69	2	1	6
Future Volume (vph)	38	595	539	30	872	7	519	32	69	2	1	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	10	11	11	10	10	14	12	12	12
Grade (%)		-1%			2%			-1%			-6%	
Storage Length (ft)	75		125	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	75			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		336			663			452			303	
Travel Time (s)		6.5			12.9			8.8			8.3	
Confl. Peds. (#/hr)	3					3			19	19		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	5%	3%	8%	2%	2%	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Detector Phase	2	2	2	6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0		33.0	33.0	33.0	33.0	33.0	
Total Split (s)	49.0	49.0	49.0	49.0	49.0		41.0	41.0	41.0	41.0	41.0	
Total Split (%)	54.4%	54.4%	54.4%	54.4%	54.4%		45.6%	45.6%	45.6%	45.6%	45.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 74 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Radnor Chester Road/Office Park Driveway & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	595	539	30	872	7	519	32	69	2	1	6
Future Volume (veh/h)	38	595	539	30	872	7	519	32	69	2	1	6
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		0.98	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	1837	1766	1866	1665	1750	1750	1837	1837	1896	2024	2024	2024
Adj Flow Rate, veh/h	40	633	0	32	928	7	552	34	54	2	1	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	5	3	8	2	2	0	0	1	0	0	0
Cap, veh/h	83	863		232	848	6	265	12	610	50	44	74
Arrive On Green	0.49	0.49	0.00	0.49	0.49	0.49	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	621	1766	1582	746	1734	13	481	30	1567	0	114	190
Grp Volume(v), veh/h	40	633	0	32	0	935	586	0	54	8	0	0
Grp Sat Flow(s),veh/h/ln	621	1766	1582	746	0	1747	511	0	1567	305	0	0
Q Serve(g_s), s	0.5	25.7	0.0	3.2	0.0	44.0	0.0	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	44.0	25.7	0.0	28.9	0.0	44.0	35.0	0.0	2.0	35.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.94		1.00	0.25		0.62
Lane Grp Cap(c), veh/h	83	863		232	0	854	276	0	610	169	0	0
V/C Ratio(X)	0.48	0.73		0.14	0.00	1.09	2.12	0.00	0.09	0.05	0.00	0.00
Avail Cap(c_a), veh/h	83	863		232	0	854	276	0	610	169	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.0	18.3	0.0	29.8	0.0	23.0	32.4	0.0	17.4	21.6	0.0	0.0
Incr Delay (d2), s/veh	18.4	5.5	0.0	1.2	0.0	59.9	516.2	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	16.2	0.0	1.2	0.0	42.2	76.9	0.0	1.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	23.8	0.0	31.1	0.0	82.9	548.6	0.0	17.5	21.7	0.0	0.0
LnGrp LOS	E	C		C	A	F	F	A	B	C	A	A
Approach Vol, veh/h		673	A		967			640			8	
Approach Delay, s/veh		26.2			81.2			503.8			21.7	
Approach LOS		C			F			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		41.0		49.0		41.0				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		43.0		34.0		43.0		34.0				
Max Q Clear Time (g_c+I1), s		46.5		37.0		46.0		37.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			183.0									
HCM 6th LOS			F									

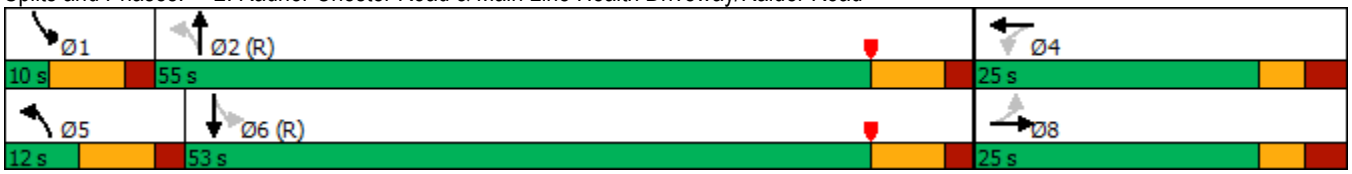
Notes

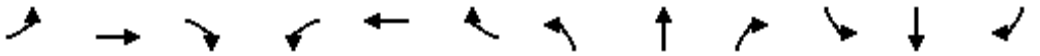
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	19	85	0	1	75	406	279	42	369	1
Future Volume (vph)	6	0	19	85	0	1	75	406	279	42	369	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	11	13	13	11	13	13	11	11	11
Grade (%)		-2%			-2%			5%			-6%	
Storage Length (ft)	175		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			75			25			100		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		317			560			921			815	
Travel Time (s)		8.6			15.3			17.9			15.9	
Confl. Peds. (#/hr)			8	8			2		4	4		2
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	9%	0%	100%	0%	4%	5%	12%	3%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	45.0		10.0	45.0	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	55.0		10.0	53.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		13.3%	61.1%		11.1%	58.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 16 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Radnor Chester Road & Main Line Health Driveway/Raider Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	19	85	0	1	75	406	279	42	369	1
Future Volume (veh/h)	6	0	19	85	0	1	75	406	279	42	369	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.97		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1875	1875	1875	1747	1950	471	1660	1669	1654	1853	1981	2024
Adj Flow Rate, veh/h	9	0	13	127	0	1	112	606	404	63	551	1
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Percent Heavy Veh, %	0	0	0	9	0	100	0	4	5	12	3	0
Cap, veh/h	294	0	227	275	0	236	660	579	386	160	1192	2
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.06	0.62	0.62	0.09	1.00	1.00
Sat Flow, veh/h	1457	0	1545	1344	0	1607	1581	933	622	1765	1977	4
Grp Volume(v), veh/h	9	0	13	127	0	1	112	0	1010	63	0	552
Grp Sat Flow(s),veh/h/ln	1457	0	1545	1344	0	1607	1581	0	1554	1765	0	1980
Q Serve(g_s), s	0.5	0.0	0.7	8.0	0.0	0.0	2.3	0.0	55.9	1.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.7	8.2	0.0	0.0	2.3	0.0	55.9	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.00
Lane Grp Cap(c), veh/h	294	0	227	275	0	236	660	0	965	160	0	1194
V/C Ratio(X)	0.03	0.00	0.06	0.46	0.00	0.00	0.17	0.00	1.05	0.39	0.00	0.46
Avail Cap(c_a), veh/h	404	0	343	376	0	357	668	0	965	162	0	1194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	33.0	36.3	0.0	32.8	5.5	0.0	17.1	21.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	1.2	0.0	0.0	0.1	0.0	41.9	1.6	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.5	4.9	0.0	0.0	1.2	0.0	37.5	1.4	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	33.1	37.5	0.0	32.8	5.6	0.0	58.9	22.8	0.0	1.3
LnGrp LOS	C	A	C	D	A	C	A	A	F	C	A	A
Approach Vol, veh/h		22			128			1122			615	
Approach Delay, s/veh		33.1			37.5			53.6			3.5	
Approach LOS		C			D			D			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	61.9		18.2	11.5	60.3		18.2				
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0				
Max Green Setting (Gmax), s	3.0	48.0		19.0	5.0	46.0		19.0				
Max Q Clear Time (g_c+I1), s	3.7	0.0		10.7	4.8	0.0		3.0				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		35.9	
HCM 6th LOS		D	

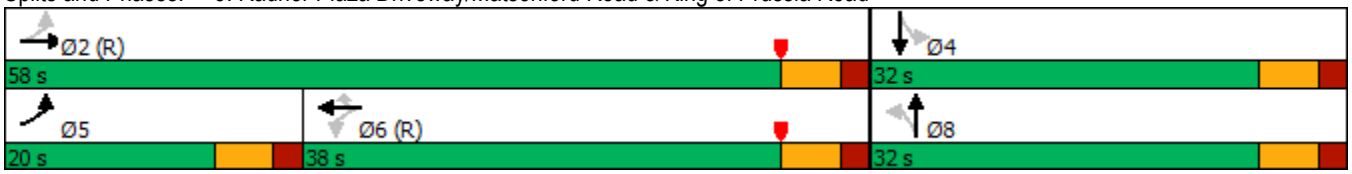
Notes

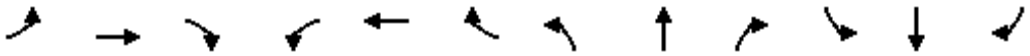
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	368	796	2	12	656	621	1	0	2	418	7	102
Future Volume (vph)	368	796	2	12	656	621	1	0	2	418	7	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	14	14	12	12	14	12	11	11	11	13	13
Grade (%)		2%			3%			6%			-2%	
Storage Length (ft)	100		0	115		285	0		0	350		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	175			50			25			275		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		469			884			278			1080	
Travel Time (s)		9.1			17.2			7.6			21.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	1%	1%	0%	1%	2%	0%	0%	0%	4%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	17.0		17.0	17.0	17.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	16.0	56.0		34.0	34.0	34.0	28.0	28.0		28.0	28.0	
Total Split (s)	20.0	58.0		38.0	38.0	38.0	32.0	32.0		32.0	32.0	
Total Split (%)	22.2%	64.4%		42.2%	42.2%	42.2%	35.6%	35.6%		35.6%	35.6%	
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	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Radnor Plaza Driveway/Matsonford Road & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	796	2	12	656	621	1	0	2	418	7	102
Future Volume (veh/h)	368	796	2	12	656	621	1	0	2	418	7	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1834	1834	1750	1736	1791	1599	1599	1599	1818	1950	1950
Adj Flow Rate, veh/h	409	884	2	13	729	0	1	0	2	464	8	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	1	1	0	1	2	0	0	0	4	0	0
Cap, veh/h	355	1077	2	210	636		410	0	407	515	57	447
Arrive On Green	0.17	0.59	0.59	0.37	0.37	0.00	0.30	0.00	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1653	1829	4	619	1736	1517	1200	0	1355	1451	189	1492
Grp Volume(v), veh/h	409	0	886	13	729	0	1	0	2	464	0	71
Grp Sat Flow(s),veh/h/ln	1653	0	1833	619	1736	1517	1200	0	1355	1451	0	1681
Q Serve(g_s), s	15.0	0.0	34.6	1.5	33.0	0.0	0.1	0.0	0.1	27.0	0.0	2.8
Cycle Q Clear(g_c), s	15.0	0.0	34.6	15.6	33.0	0.0	2.3	0.0	0.1	27.0	0.0	2.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	355	0	1080	210	636		410	0	407	515	0	504
V/C Ratio(X)	1.15	0.00	0.82	0.06	1.15		0.00	0.00	0.00	0.90	0.00	0.14
Avail Cap(c_a), veh/h	355	0	1080	210	636		410	0	407	515	0	504
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	14.7	28.7	28.5	0.0	23.7	0.0	22.1	32.3	0.0	23.0
Incr Delay (d2), s/veh	95.3	0.0	7.0	0.6	83.0	0.0	0.0	0.0	0.0	19.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	20.1	0.0	20.6	0.5	39.4	0.0	0.0	0.0	0.1	18.4	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.2	0.0	21.7	29.3	111.5	0.0	23.7	0.0	22.1	51.9	0.0	23.3
LnGrp LOS	F	A	C	C	F		C	A	C	D	A	C
Approach Vol, veh/h		1295			742	A		3			535	
Approach Delay, s/veh		53.5			110.1			22.6			48.1	
Approach LOS		D			F			C			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		58.0		32.0	20.0	38.0		32.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		52.0		26.0	14.0	32.0		26.0				
Max Q Clear Time (g_c+I1), s		36.6		29.5	17.5	35.5		4.8				
Green Ext Time (p_c), s		13.3		0.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			68.6									
HCM 6th LOS			E									

Notes

User approved pedestrian interval to be less than phase max green.

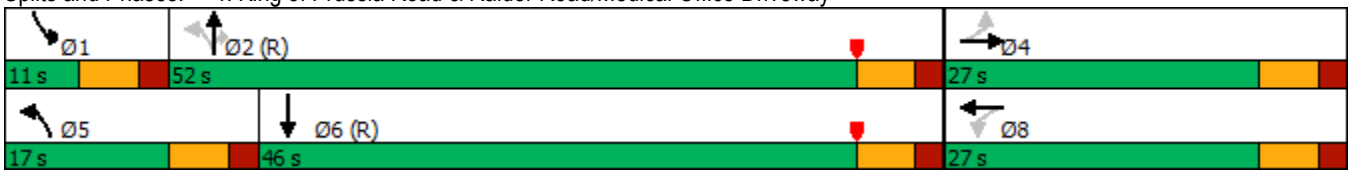
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

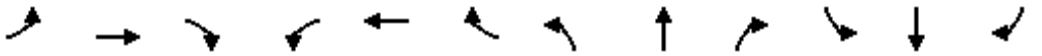
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	130	99	0	22	173	1268	396	79	362	58
Future Volume (vph)	9	0	130	99	0	22	173	1268	396	79	362	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	13	13	13	12	12	12	11	12	14	11	13	13
Grade (%)		-2%			-1%			-2%			0%	
Storage Length (ft)	0		0	115		0	250		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			100			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		265			338			428			1165	
Travel Time (s)		7.2			9.2			8.3			26.5	
Confl. Peds. (#/hr)							8					8
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	11%	0%	4%	0%	0%	0%	0%	2%	0%	0%	10%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		3.0	28.0	28.0	3.0	28.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		11.0	46.0	46.0	11.0	46.0	
Total Split (s)	27.0	27.0		27.0	27.0		17.0	52.0	52.0	11.0	46.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		18.9%	57.8%	57.8%	12.2%	51.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 23 (26%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 4: King of Prussia Road & Raider Road/Medical Office Driveway

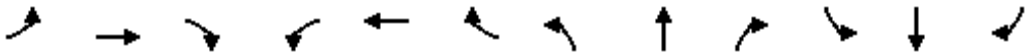




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	130	99	0	22	173	1268	396	79	362	58
Future Volume (veh/h)	9	0	130	99	0	22	173	1268	396	79	362	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	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	1787	1950	1890	1837	1837	1837	1875	1846	1950	1800	1726	1872
Adj Flow Rate, veh/h	12	0	167	127	0	28	222	1626	508	101	464	74
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	11	0	4	0	0	0	0	2	0	0	10	0
Cap, veh/h	52	10	265	255	0	267	504	1099	976	114	830	132
Arrive On Green	0.17	0.00	0.17	0.17	0.00	0.17	0.09	0.60	0.60	0.02	0.19	0.19
Sat Flow, veh/h	56	55	1545	1263	0	1557	1785	1846	1641	1714	1451	231
Grp Volume(v), veh/h	179	0	0	127	0	28	222	1626	508	101	0	538
Grp Sat Flow(s),veh/h/ln	1656	0	0	1263	0	1557	1785	1846	1641	1714	0	1682
Q Serve(g_s), s	1.3	0.0	0.0	3.2	0.0	1.4	4.3	53.6	16.3	5.3	0.0	26.1
Cycle Q Clear(g_c), s	9.0	0.0	0.0	11.7	0.0	1.4	4.3	53.6	16.3	5.3	0.0	26.1
Prop In Lane	0.07		0.93	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	327	0	0	255	0	267	504	1099	976	114	0	962
V/C Ratio(X)	0.55	0.00	0.00	0.50	0.00	0.10	0.44	1.48	0.52	0.88	0.00	0.56
Avail Cap(c_a), veh/h	446	0	0	347	0	381	582	1099	976	114	0	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	0.0	36.2	0.0	31.4	10.7	18.2	10.7	43.7	0.0	26.2
Incr Delay (d2), s/veh	1.4	0.0	0.0	1.5	0.0	0.2	0.6	221.0	2.0	50.0	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	0.0	0.0	5.0	0.0	0.9	2.6	132.1	9.6	7.0	0.0	18.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	0.0	0.0	37.7	0.0	31.6	11.3	239.2	12.7	93.7	0.0	28.6
LnGrp LOS	D	A	A	D	A	C	B	F	B	F	A	C
Approach Vol, veh/h		179			155			2356			639	
Approach Delay, s/veh		36.0			36.6			168.9			38.9	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	58.6		20.4	13.1	56.5		20.4				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	46.0		21.0	11.0	40.0		21.0				
Max Q Clear Time (g_c+I1), s	7.8	56.1		11.0	6.8	28.1		14.2				
Green Ext Time (p_c), s	0.0	0.0		0.5	0.3	6.3		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			130.6									
HCM 6th LOS			F									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	539	82	96	692	14	24	0	28	1	0	0
Future Volume (vph)	3	539	82	96	692	14	24	0	28	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	12	10	12	12	12	12	12	15	15	15
Grade (%)		-4%			3%			-3%			-7%	
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		663			1165			255			210	
Travel Time (s)		12.9			22.7			7.0			5.7	
Confl. Peds. (#/hr)	3		1	1		3						
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	4%	9%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	539	82	96	692	14	24	0	28	1	0	0
Future Vol, veh/h	3	539	82	96	692	14	24	0	28	1	0	0
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-4	-	-	3	-	-	-3	-	-	-7	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	4	9	0	0	0	0	0	0
Mvmt Flow	3	586	89	104	752	15	26	0	30	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	770	0	0	676	0	0	1561	1571	587	1623	1653	763
Stage 1	-	-	-	-	-	-	593	593	-	971	971	-
Stage 2	-	-	-	-	-	-	968	978	-	652	682	-
Critical Hdwy	4.3	-	-	4.3	-	-	6.5	5.9	5.9	5.7	5.1	5.5
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	648	-	-	700	-	-	128	145	565	168	189	494
Stage 1	-	-	-	-	-	-	615	548	-	493	487	-
Stage 2	-	-	-	-	-	-	398	390	-	664	590	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	646	-	-	699	-	-	102	106	564	126	138	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	102	106	-	126	138	-
Stage 1	-	-	-	-	-	-	609	543	-	487	359	-
Stage 2	-	-	-	-	-	-	295	287	-	623	585	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.3	30.3	33.8
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	102	564	646	-	-	699	-	-	126
HCM Lane V/C Ratio	0.256	0.054	0.005	-	-	0.149	-	-	0.009
HCM Control Delay (s)	52	11.7	10.6	0	-	11.1	0	-	33.8
HCM Lane LOS	F	B	B	A	-	B	A	-	D
HCM 95th %tile Q(veh)	0.9	0.2	0	-	-	0.5	-	-	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	20	425	76	81	418
Future Volume (vph)	21	20	425	76	81	418
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	14	10	14	14
Grade (%)	1%		3%			1%
Storage Length (ft)	0	0		100	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Link Speed (mph)	25		35			35
Link Distance (ft)	241		815			452
Travel Time (s)	6.6		15.9			8.8
Confl. Peds. (#/hr)				89	89	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	20%	0%	3%	0%	0%	4%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	20	425	76	81	418
Future Vol, veh/h	21	20	425	76	81	418
Conflicting Peds, #/hr	0	0	0	89	89	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	1	-	3	-	-	1
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	20	0	3	0	0	4
Mvmt Flow	27	26	552	99	105	543

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1394	641	0	0	740	0
Stage 1	641	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Critical Hdwy	6.7	6.3	-	-	4.3	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.1	3.1	-	-	3	-
Pot Cap-1 Maneuver	149	492	-	-	664	-
Stage 1	538	-	-	-	-	-
Stage 2	469	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	98	436	-	-	589	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	349	-	-	-	-	-

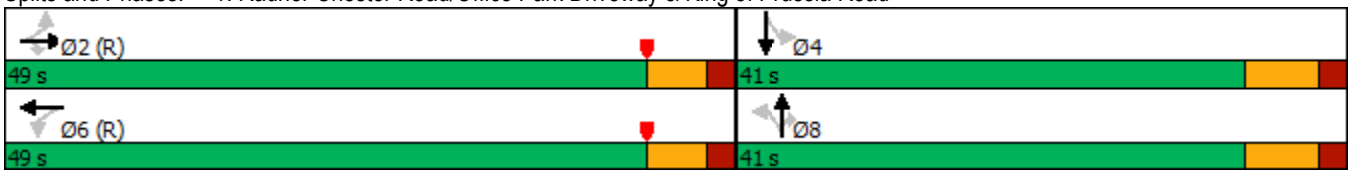
Approach	WB	NB	SB
HCM Control Delay, s	38.9	0	2
HCM LOS	E		

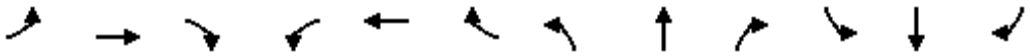
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	158	589	-
HCM Lane V/C Ratio	-	-	0.337	0.179	-
HCM Control Delay (s)	-	-	38.9	12.4	0
HCM Lane LOS	-	-	E	B	A
HCM 95th %tile Q(veh)	-	-	1.4	0.6	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	804	693	68	603	1	475	7	144	31	37	49
Future Volume (vph)	8	804	693	68	603	1	475	7	144	31	37	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	10	11	11	10	10	14	12	12	12
Grade (%)		-1%			2%			-1%			-6%	
Storage Length (ft)	75		125	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	75			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		336			663			452			303	
Travel Time (s)		6.5			12.9			8.8			8.3	
Confl. Peds. (#/hr)	11					11	1		22	22		1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	1%	1%	1%	14%	14%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Detector Phase	2	2	2	6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	49.0	49.0	49.0	49.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (s)	49.0	49.0	49.0	49.0	49.0		41.0	41.0	41.0	41.0	41.0	
Total Split (%)	54.4%	54.4%	54.4%	54.4%	54.4%		45.6%	45.6%	45.6%	45.6%	45.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 20 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Radnor Chester Road/Office Park Driveway & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	804	693	68	603	1	475	7	144	31	37	49
Future Volume (veh/h)	8	804	693	68	603	1	475	7	144	31	37	49
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		0.97	1.00		0.97	1.00		0.97
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	1823	1823	1911	1764	1764	1764	1638	1638	1896	1981	1981	1981
Adj Flow Rate, veh/h	8	829	0	70	622	1	490	7	96	32	38	35
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, %	1	1	0	1	1	1	14	14	1	3	3	3
Cap, veh/h	464	891		121	861	1	279	3	607	52	62	31
Arrive On Green	0.49	0.49	0.00	0.98	0.98	0.98	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	821	1823	1619	658	1760	3	512	7	1561	0	160	80
Grp Volume(v), veh/h	8	829	0	70	0	623	497	0	96	105	0	0
Grp Sat Flow(s),veh/h/ln	821	1823	1619	658	0	1763	519	0	1561	241	0	0
Q Serve(g_s), s	0.5	38.4	0.0	5.6	0.0	2.4	0.0	0.0	3.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.4	38.4	0.0	44.0	0.0	2.4	35.0	0.0	3.6	35.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.99		1.00	0.30		0.33
Lane Grp Cap(c), veh/h	464	891		121	0	862	281	0	607	146	0	0
V/C Ratio(X)	0.02	0.93		0.58	0.00	0.72	1.77	0.00	0.16	0.72	0.00	0.00
Avail Cap(c_a), veh/h	464	891		121	0	862	281	0	607	146	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.9	21.6	0.0	21.3	0.0	0.5	32.4	0.0	17.9	23.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	17.3	0.0	18.5	0.0	5.2	359.0	0.0	0.1	15.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	26.1	0.0	3.5	0.0	2.7	57.1	0.0	2.3	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	38.9	0.0	39.8	0.0	5.8	391.4	0.0	18.0	38.8	0.0	0.0
LnGrp LOS	B	D		D	A	A	F	A	B	D	A	A
Approach Vol, veh/h		837	A		693			593			105	
Approach Delay, s/veh		38.6			9.2			331.0			38.8	
Approach LOS		D			A			F			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		41.0		49.0		41.0				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		43.0		34.0		43.0		34.0				
Max Q Clear Time (g_c+I1), s		40.9		37.0		46.5		37.0				
Green Ext Time (p_c), s		1.8		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			107.3									
HCM 6th LOS			F									

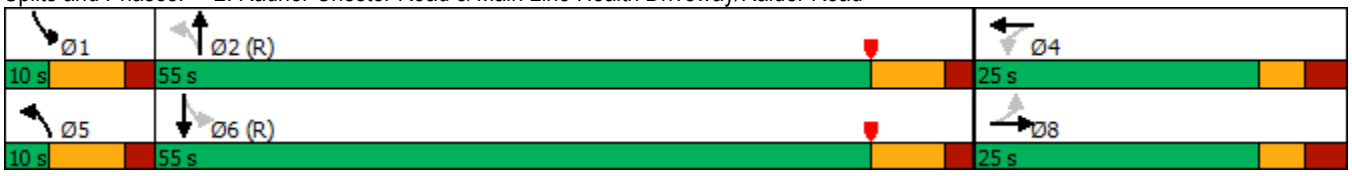
Notes

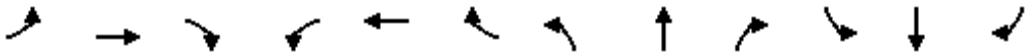
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	69	84	0	6	28	323	80	12	678	3
Future Volume (vph)	30	0	69	84	0	6	28	323	80	12	678	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	11	13	13	11	13	13	11	11	11
Grade (%)		-2%			-2%			5%			-6%	
Storage Length (ft)	175		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			75			25			100		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		317			560			921			815	
Travel Time (s)		8.6			15.3			17.9			15.9	
Confl. Peds. (#/hr)			1	1			3		1	1		3
Confl. Bikes (#/hr)									3			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	45.0		10.0	45.0	
Total Split (s)	25.0	25.0		25.0	25.0		10.0	55.0		10.0	55.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		11.1%	61.1%		11.1%	61.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 83 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Radnor Chester Road & Main Line Health Driveway/Raider Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	69	84	0	6	28	323	80	12	678	3
Future Volume (veh/h)	30	0	69	84	0	6	28	323	80	12	678	3
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		0.98	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	1875	1875	1875	1875	1950	1950	1660	1712	1698	2024	2009	2024
Adj Flow Rate, veh/h	32	0	45	90	0	6	30	347	76	13	729	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	2	0	1	0
Cap, veh/h	261	0	193	226	0	201	574	905	198	736	1322	4
Arrive On Green	0.12	0.00	0.12	0.12	0.00	0.12	0.03	0.67	0.67	0.04	1.00	1.00
Sat Flow, veh/h	1485	0	1582	1435	0	1645	1581	1354	297	1927	2003	5
Grp Volume(v), veh/h	32	0	45	90	0	6	30	0	423	13	0	731
Grp Sat Flow(s),veh/h/ln	1485	0	1582	1435	0	1645	1581	0	1650	1927	0	2008
Q Serve(g_s), s	1.7	0.0	2.3	5.4	0.0	0.3	0.5	0.0	10.3	0.2	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	2.3	7.2	0.0	0.3	0.5	0.0	10.3	0.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.00
Lane Grp Cap(c), veh/h	261	0	193	226	0	201	574	0	1104	736	0	1326
V/C Ratio(X)	0.12	0.00	0.23	0.40	0.00	0.03	0.05	0.00	0.38	0.02	0.00	0.55
Avail Cap(c_a), veh/h	410	0	352	370	0	366	598	0	1104	782	0	1326
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	35.7	38.7	0.0	34.8	4.4	0.0	6.6	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	1.1	0.0	0.1	0.0	0.0	1.0	0.0	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.0	1.7	3.5	0.0	0.2	0.3	0.0	5.9	0.1	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	0.0	36.3	39.9	0.0	34.9	4.5	0.0	7.7	5.0	0.0	1.7
LnGrp LOS	D	A	D	D	A	C	A	A	A	A	A	A
Approach Vol, veh/h		77			96			453			744	
Approach Delay, s/veh		36.0			39.5			7.4			1.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	66.2		16.0	8.6	65.4		16.0				
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0				
Max Green Setting (Gmax), s	3.0	48.0		19.0	3.0	48.0		19.0				
Max Q Clear Time (g_c+I1), s	2.7	0.0		9.7	3.0	0.0		4.3				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		8.2	
HCM 6th LOS		A	

Notes

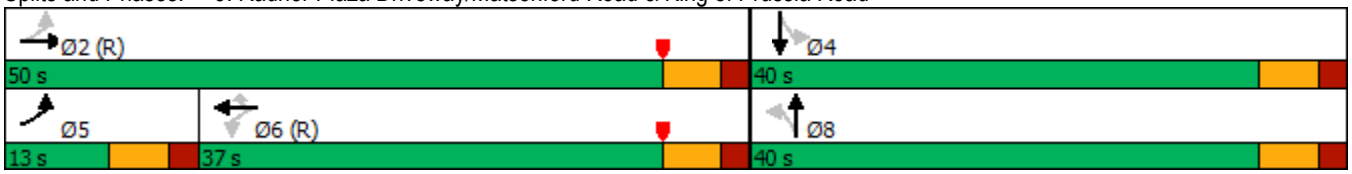
User approved pedestrian interval to be less than phase max green.

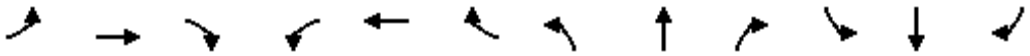
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	803	1	7	647	374	3	4	9	564	1	216
Future Volume (vph)	120	803	1	7	647	374	3	4	9	564	1	216
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	14	14	12	12	14	12	11	11	11	13	13
Grade (%)		2%			3%			6%			-2%	
Storage Length (ft)	100		0	115		285	0		0	350		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	175			50			25			275		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		469			884			278			1080	
Travel Time (s)		9.1			17.2			7.6			21.0	
Confl. Peds. (#/hr)			2	2					2	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	17.0		17.0	17.0	17.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	44.0		29.0	29.0	29.0	34.0	34.0		34.0	34.0	
Total Split (s)	13.0	50.0		37.0	37.0	37.0	40.0	40.0		40.0	40.0	
Total Split (%)	14.4%	55.6%		41.1%	41.1%	41.1%	44.4%	44.4%		44.4%	44.4%	
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	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 44 (49%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 3: Radnor Plaza Driveway/Matsonford Road & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	803	1	7	647	374	3	4	9	564	1	216
Future Volume (veh/h)	120	803	1	7	647	374	3	4	9	564	1	216
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1778	1849	1849	1750	1750	1791	1599	1599	1599	1860	1950	1950
Adj Flow Rate, veh/h	130	873	1	8	703	0	3	4	10	613	1	158
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	2	0	0	0	1	0	0
Cap, veh/h	216	923	1	116	637		444	157	393	649	4	637
Arrive On Green	0.08	0.50	0.50	0.36	0.36	0.00	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1693	1846	2	626	1750	1517	1106	404	1010	1466	10	1639
Grp Volume(v), veh/h	130	0	874	8	703	0	3	0	14	613	0	159
Grp Sat Flow(s),veh/h/ln	1693	0	1848	626	1750	1517	1106	0	1414	1466	0	1649
Q Serve(g_s), s	4.0	0.0	40.4	1.1	32.8	0.0	0.2	0.0	0.5	35.0	0.0	5.9
Cycle Q Clear(g_c), s	4.0	0.0	40.4	28.7	32.8	0.0	5.5	0.0	0.5	35.0	0.0	5.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.71	1.00		0.99
Lane Grp Cap(c), veh/h	216	0	924	116	637		444	0	550	649	0	641
V/C Ratio(X)	0.60	0.00	0.95	0.07	1.10		0.01	0.00	0.03	0.94	0.00	0.25
Avail Cap(c_a), veh/h	230	0	924	116	637		444	0	550	649	0	641
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	21.3	40.5	28.6	0.0	20.3	0.0	17.0	28.8	0.0	18.6
Incr Delay (d2), s/veh	3.9	0.0	19.1	1.2	67.2	0.0	0.0	0.0	0.0	23.0	0.0	0.4
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	3.0	0.0	27.9	0.4	35.1	0.0	0.1	0.0	0.3	23.7	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	40.4	41.7	95.8	0.0	20.3	0.0	17.0	51.8	0.0	19.0
LnGrp LOS	C	A	D	D	F		C	A	B	D	A	B
Approach Vol, veh/h		1004			711	A		17			772	
Approach Delay, s/veh		38.3			95.2			17.6			45.0	
Approach LOS		D			F			B			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		50.0		40.0	12.2	37.8		40.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		44.0		34.0	7.0	31.0		34.0				
Max Q Clear Time (g_c+I1), s		42.4		37.5	6.5	35.3		8.0				
Green Ext Time (p_c), s		1.5		0.0	0.0	0.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			56.4									
HCM 6th LOS			E									

Notes

User approved pedestrian interval to be less than phase max green.

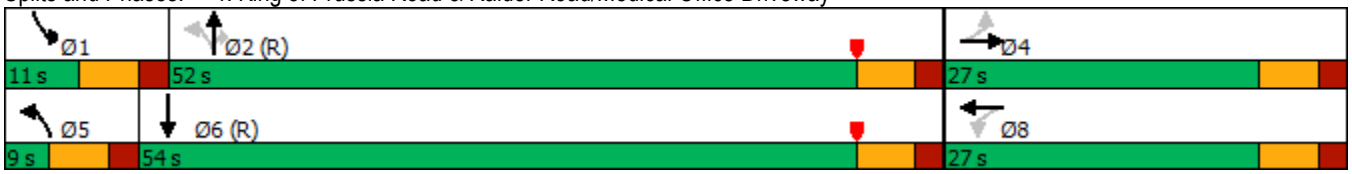
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

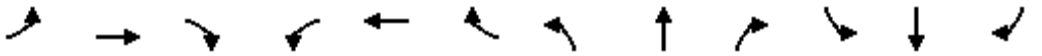
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	41	272	0	60	23	394	106	19	1341	5
Future Volume (vph)	5	0	41	272	0	60	23	394	106	19	1341	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	13	13	13	12	12	12	11	12	14	11	13	13
Grade (%)		-2%			-1%			-2%			0%	
Storage Length (ft)	0		0	115		0	250		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			100			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		265			338			428			1165	
Travel Time (s)		7.2			9.2			8.3			26.5	
Confl. Peds. (#/hr)							3					3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		3.0	28.0	28.0	3.0	28.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		9.0	46.0	46.0	11.0	46.0	
Total Split (s)	27.0	27.0		27.0	27.0		9.0	52.0	52.0	11.0	54.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		10.0%	57.8%	57.8%	12.2%	60.0%	
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	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 4: King of Prussia Road & Raider Road/Medical Office Driveway

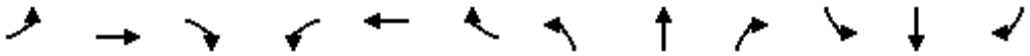




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	41	272	0	60	23	394	106	19	1341	5
Future Volume (veh/h)	5	0	41	272	0	60	23	394	106	19	1341	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1950	1950	1950	1837	1837	1837	1875	1860	1950	1800	1857	1872
Adj Flow Rate, veh/h	5	0	44	289	0	64	24	419	113	20	1427	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	0	0	1	0
Cap, veh/h	61	23	347	415	0	363	129	1067	945	46	1062	4
Arrive On Green	0.23	0.00	0.23	0.23	0.00	0.23	0.03	0.57	0.57	0.03	0.57	0.57
Sat Flow, veh/h	72	97	1489	1413	0	1557	1785	1860	1648	1714	1850	6
Grp Volume(v), veh/h	49	0	0	289	0	64	24	419	113	20	0	1432
Grp Sat Flow(s),veh/h/ln	1658	0	0	1413	0	1557	1785	1860	1648	1714	0	1856
Q Serve(g_s), s	0.0	0.0	0.0	15.7	0.0	3.0	0.5	11.2	2.8	1.0	0.0	51.7
Cycle Q Clear(g_c), s	2.1	0.0	0.0	17.3	0.0	3.0	0.5	11.2	2.8	1.0	0.0	51.7
Prop In Lane	0.10		0.90	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	430	0	0	415	0	363	129	1067	945	46	0	1066
V/C Ratio(X)	0.11	0.00	0.00	0.70	0.00	0.18	0.19	0.39	0.12	0.44	0.00	1.34
Avail Cap(c_a), veh/h	449	0	0	431	0	381	162	1067	945	114	0	1066
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	32.9	0.0	27.6	22.1	10.6	8.8	43.1	0.0	19.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	4.6	0.0	0.2	0.7	1.1	0.3	6.5	0.0	160.9
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	1.5	0.0	0.0	10.7	0.0	2.0	0.5	7.8	1.8	0.9	0.0	99.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	0.0	37.6	0.0	27.8	22.8	11.6	9.0	49.7	0.0	180.1
LnGrp LOS	C	A	A	D	A	C	C	B	A	D	A	F
Approach Vol, veh/h		49			353			556			1452	
Approach Delay, s/veh		27.4			35.8			11.6			178.3	
Approach LOS		C			D			B			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	56.6		26.0	7.4	56.7		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	46.0		21.0	3.0	48.0		21.0				
Max Q Clear Time (g_c+I1), s	3.5	13.7		4.1	3.0	53.7		19.8				
Green Ext Time (p_c), s	0.0	10.4		0.1	0.0	0.0		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		115.9
HCM 6th LOS		F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	507	35	35	796	10	81	0	111	18	0	4
Future Volume (vph)	1	507	35	35	796	10	81	0	111	18	0	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	12	10	12	12	12	12	12	15	15	15
Grade (%)		-4%			3%			-3%			-7%	
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		663			1165			255			183	
Travel Time (s)		12.9			22.7			7.0			5.0	
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	8%	25%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

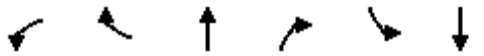
Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	507	35	35	796	10	81	0	111	18	0	4
Future Vol, veh/h	1	507	35	35	796	10	81	0	111	18	0	4
Conflicting Peds, #/hr	1	0	1	1	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-4	-	-	3	-	-	-3	-	-	-7	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	8	25	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	583	40	40	915	11	93	0	128	21	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	927	0	0	624	0	0	1589	1593	584	1671	1628	922
Stage 1	-	-	-	-	-	-	586	586	-	1002	1002	-
Stage 2	-	-	-	-	-	-	1003	1007	-	669	626	-
Critical Hdwy	4.3	-	-	4.3	-	-	6.5	5.9	5.9	5.7	5.1	5.5
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	569	-	-	730	-	-	123	141	567	158	194	411
Stage 1	-	-	-	-	-	-	620	552	-	478	477	-
Stage 2	-	-	-	-	-	-	382	380	-	654	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	568	-	-	729	-	-	111	125	566	111	171	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	111	125	-	111	171	-
Stage 1	-	-	-	-	-	-	618	550	-	476	423	-
Stage 2	-	-	-	-	-	-	335	337	-	505	610	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	57.2	39.9
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	111	566	568	-	-	729	-	-	128
HCM Lane V/C Ratio	0.839	0.225	0.002	-	-	0.055	-	-	0.198
HCM Control Delay (s)	117.6	13.2	11.4	0	-	10.2	0	-	39.9
HCM Lane LOS	F	B	B	A	-	B	A	-	E
HCM 95th %tile Q(veh)	4.9	0.9	0	-	-	0.2	-	-	0.7



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	76	81	363	29	34	605
Future Volume (vph)	76	81	363	29	34	605
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	14	10	14	14
Grade (%)	1%		3%			1%
Storage Length (ft)	0	0		100	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Link Speed (mph)	25		35			35
Link Distance (ft)	241		815			452
Travel Time (s)	6.6		15.9			8.8
Confl. Peds. (#/hr)				1	1	
Confl. Bikes (#/hr)		1		1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	20%	1%	20%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	81	363	29	34	605
Future Vol, veh/h	76	81	363	29	34	605
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	1	-	3	-	-	1
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	20	1	20	0	1
Mvmt Flow	84	89	399	32	37	665

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1139	400	0	0	432	0
Stage 1	400	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.3	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3	3.2	-	-	3	-
Pot Cap-1 Maneuver	230	657	-	-	853	-
Stage 1	757	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	214	656	-	-	852	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	474	-	-	-	-	-

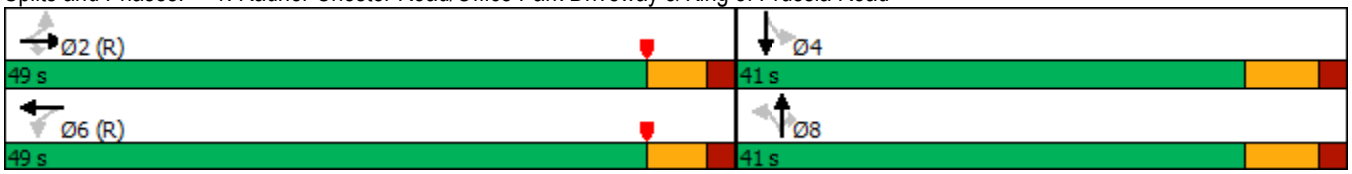
Approach	WB	NB	SB
HCM Control Delay, s	27.5	0	0.5
HCM LOS	D		

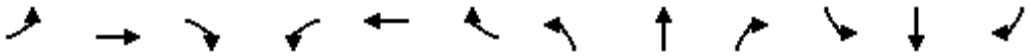
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	328	852	-
HCM Lane V/C Ratio	-	-	0.526	0.044	-
HCM Control Delay (s)	-	-	27.5	9.4	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	2.9	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	653	481	30	886	7	506	32	69	2	1	6
Future Volume (vph)	38	653	481	30	886	7	506	32	69	2	1	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	10	11	11	10	10	14	12	12	12
Grade (%)		-1%			2%			-1%			-6%	
Storage Length (ft)	75		125	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	75			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		336			663			452			303	
Travel Time (s)		6.5			12.9			8.8			8.3	
Confl. Peds. (#/hr)	3					3			19	19		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	5%	3%	8%	2%	2%	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Detector Phase	2	2	2	6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0		33.0	33.0	33.0	33.0	33.0	
Total Split (s)	49.0	49.0	49.0	49.0	49.0		41.0	41.0	41.0	41.0	41.0	
Total Split (%)	54.4%	54.4%	54.4%	54.4%	54.4%		45.6%	45.6%	45.6%	45.6%	45.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 74 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Radnor Chester Road/Office Park Driveway & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	653	481	30	886	7	506	32	69	2	1	6
Future Volume (veh/h)	38	653	481	30	886	7	506	32	69	2	1	6
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		0.98	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	1837	1766	1866	1665	1750	1750	1837	1837	1896	2024	2024	2024
Adj Flow Rate, veh/h	40	695	0	32	943	7	538	34	54	2	1	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	5	3	8	2	2	0	0	1	0	0	0
Cap, veh/h	83	863		191	848	6	265	12	610	50	44	74
Arrive On Green	0.49	0.49	0.00	0.49	0.49	0.49	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	612	1766	1582	705	1734	13	481	30	1567	0	114	190
Grp Volume(v), veh/h	40	695	0	32	0	950	572	0	54	8	0	0
Grp Sat Flow(s),veh/h/ln	612	1766	1582	705	0	1747	511	0	1567	305	0	0
Q Serve(g_s), s	0.5	29.8	0.0	3.6	0.0	44.0	0.0	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	44.0	29.8	0.0	33.5	0.0	44.0	35.0	0.0	2.0	35.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.94		1.00	0.25		0.62
Lane Grp Cap(c), veh/h	83	863		191	0	854	277	0	610	169	0	0
V/C Ratio(X)	0.48	0.80		0.17	0.00	1.11	2.07	0.00	0.09	0.05	0.00	0.00
Avail Cap(c_a), veh/h	83	863		191	0	854	277	0	610	169	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.0	19.4	0.0	33.5	0.0	23.0	32.4	0.0	17.4	21.6	0.0	0.0
Incr Delay (d2), s/veh	18.4	7.9	0.0	1.9	0.0	66.4	493.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	18.9	0.0	1.3	0.0	44.6	74.0	0.0	1.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	27.3	0.0	35.4	0.0	89.4	525.5	0.0	17.5	21.7	0.0	0.0
LnGrp LOS	E	C		D	A	F	F	A	B	C	A	A
Approach Vol, veh/h		735	A		982			626			8	
Approach Delay, s/veh		29.2			87.6			481.7			21.7	
Approach LOS		C			F			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		41.0		49.0		41.0				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		43.0		34.0		43.0		34.0				
Max Q Clear Time (g_c+I1), s		46.5		37.0		46.0		37.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		174.1
HCM 6th LOS		F

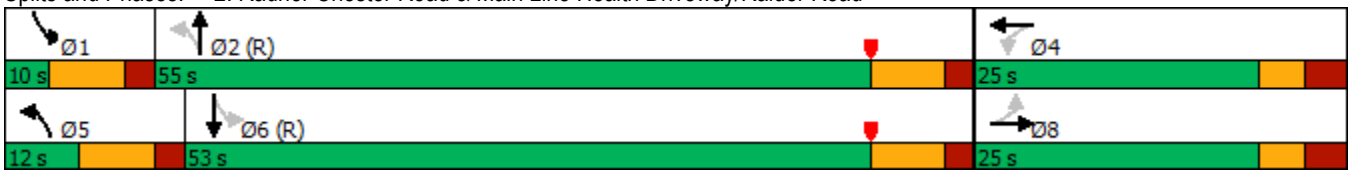
Notes

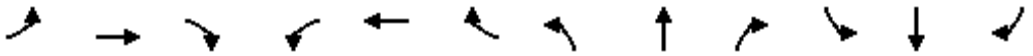
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	19	85	0	1	75	406	279	42	369	1
Future Volume (vph)	6	0	19	85	0	1	75	406	279	42	369	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	11	13	13	11	13	13	11	11	11
Grade (%)		-2%			-2%			5%			-6%	
Storage Length (ft)	175		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			75			25			100		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		317			560			921			815	
Travel Time (s)		8.6			15.3			17.9			15.9	
Confl. Peds. (#/hr)			8	8			2		4	4		2
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	9%	0%	100%	0%	4%	5%	12%	3%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	45.0		10.0	45.0	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	55.0		10.0	53.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		13.3%	61.1%		11.1%	58.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 16 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Radnor Chester Road & Main Line Health Driveway/Raider Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	19	85	0	1	75	406	279	42	369	1
Future Volume (veh/h)	6	0	19	85	0	1	75	406	279	42	369	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.97		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1875	1875	1875	1747	1950	471	1660	1669	1654	1853	1981	2024
Adj Flow Rate, veh/h	9	0	13	127	0	1	112	606	404	63	551	1
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Percent Heavy Veh, %	0	0	0	9	0	100	0	4	5	12	3	0
Cap, veh/h	294	0	227	275	0	236	660	579	386	160	1192	2
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.06	0.62	0.62	0.09	1.00	1.00
Sat Flow, veh/h	1457	0	1545	1344	0	1607	1581	933	622	1765	1977	4
Grp Volume(v), veh/h	9	0	13	127	0	1	112	0	1010	63	0	552
Grp Sat Flow(s),veh/h/ln	1457	0	1545	1344	0	1607	1581	0	1554	1765	0	1980
Q Serve(g_s), s	0.5	0.0	0.7	8.0	0.0	0.0	2.3	0.0	55.9	1.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.7	8.2	0.0	0.0	2.3	0.0	55.9	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.00
Lane Grp Cap(c), veh/h	294	0	227	275	0	236	660	0	965	160	0	1194
V/C Ratio(X)	0.03	0.00	0.06	0.46	0.00	0.00	0.17	0.00	1.05	0.39	0.00	0.46
Avail Cap(c_a), veh/h	404	0	343	376	0	357	668	0	965	162	0	1194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	33.0	36.3	0.0	32.8	5.5	0.0	17.1	21.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	1.2	0.0	0.0	0.1	0.0	41.9	1.6	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.5	4.9	0.0	0.0	1.2	0.0	37.5	1.4	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	33.1	37.5	0.0	32.8	5.6	0.0	58.9	22.8	0.0	1.3
LnGrp LOS	C	A	C	D	A	C	A	A	F	C	A	A
Approach Vol, veh/h		22			128			1122			615	
Approach Delay, s/veh		33.1			37.5			53.6			3.5	
Approach LOS		C			D			D			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	61.9		18.2	11.5	60.3		18.2				
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0				
Max Green Setting (Gmax), s	3.0	48.0		19.0	5.0	46.0		19.0				
Max Q Clear Time (g_c+I1), s	3.7	0.0		10.7	4.8	0.0		3.0				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			35.9									
HCM 6th LOS			D									

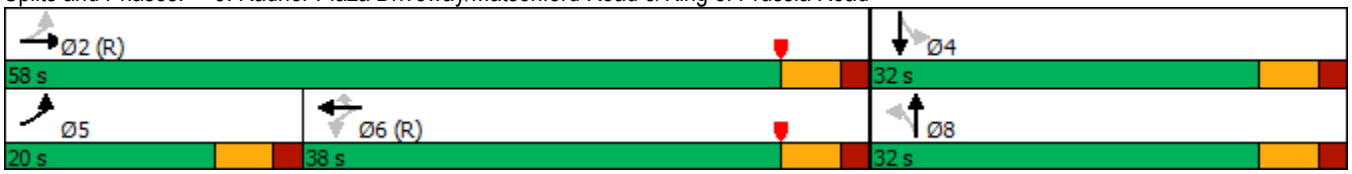
Notes

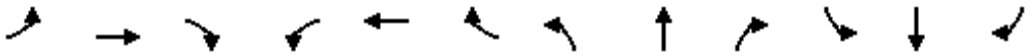
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	368	796	2	12	656	621	1	0	2	418	7	102
Future Volume (vph)	368	796	2	12	656	621	1	0	2	418	7	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	14	14	12	12	14	12	11	11	11	13	13
Grade (%)		2%			3%			6%			-2%	
Storage Length (ft)	100		0	115		285	0		0	350		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	175			50			25			275		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		469			884			278			1080	
Travel Time (s)		9.1			17.2			7.6			21.0	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	1%	1%	0%	1%	2%	0%	0%	0%	4%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	17.0		17.0	17.0	17.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	16.0	56.0		34.0	34.0	34.0	28.0	28.0		28.0	28.0	
Total Split (s)	20.0	58.0		38.0	38.0	38.0	32.0	32.0		32.0	32.0	
Total Split (%)	22.2%	64.4%		42.2%	42.2%	42.2%	35.6%	35.6%		35.6%	35.6%	
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	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Radnor Plaza Driveway/Matsonford Road & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	796	2	12	656	621	1	0	2	418	7	102
Future Volume (veh/h)	368	796	2	12	656	621	1	0	2	418	7	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1834	1834	1750	1736	1791	1599	1599	1599	1818	1950	1950
Adj Flow Rate, veh/h	409	884	2	13	729	0	1	0	2	464	8	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	1	1	0	1	2	0	0	0	4	0	0
Cap, veh/h	355	1077	2	210	636		410	0	407	515	57	447
Arrive On Green	0.17	0.59	0.59	0.37	0.37	0.00	0.30	0.00	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1653	1829	4	619	1736	1517	1200	0	1355	1451	189	1492
Grp Volume(v), veh/h	409	0	886	13	729	0	1	0	2	464	0	71
Grp Sat Flow(s),veh/h/ln	1653	0	1833	619	1736	1517	1200	0	1355	1451	0	1681
Q Serve(g_s), s	15.0	0.0	34.6	1.5	33.0	0.0	0.1	0.0	0.1	27.0	0.0	2.8
Cycle Q Clear(g_c), s	15.0	0.0	34.6	15.6	33.0	0.0	2.3	0.0	0.1	27.0	0.0	2.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	355	0	1080	210	636		410	0	407	515	0	504
V/C Ratio(X)	1.15	0.00	0.82	0.06	1.15		0.00	0.00	0.00	0.90	0.00	0.14
Avail Cap(c_a), veh/h	355	0	1080	210	636		410	0	407	515	0	504
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	14.7	28.7	28.5	0.0	23.7	0.0	22.1	32.3	0.0	23.0
Incr Delay (d2), s/veh	95.3	0.0	7.0	0.6	83.0	0.0	0.0	0.0	0.0	19.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	20.1	0.0	20.6	0.5	39.4	0.0	0.0	0.0	0.1	18.4	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.2	0.0	21.7	29.3	111.5	0.0	23.7	0.0	22.1	51.9	0.0	23.3
LnGrp LOS	F	A	C	C	F		C	A	C	D	A	C
Approach Vol, veh/h		1295			742	A		3			535	
Approach Delay, s/veh		53.5			110.1			22.6			48.1	
Approach LOS		D			F			C			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		58.0		32.0	20.0	38.0		32.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		52.0		26.0	14.0	32.0		26.0				
Max Q Clear Time (g_c+I1), s		36.6		29.5	17.5	35.5		4.8				
Green Ext Time (p_c), s		13.3		0.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			68.6									
HCM 6th LOS			E									

Notes

User approved pedestrian interval to be less than phase max green.

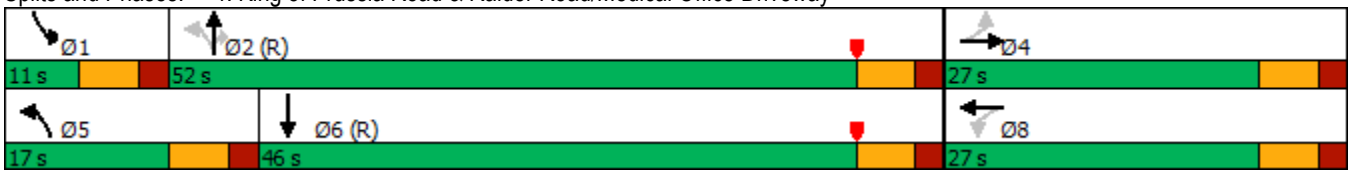
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

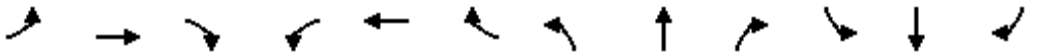
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	130	99	0	22	173	1268	396	79	362	58
Future Volume (vph)	9	0	130	99	0	22	173	1268	396	79	362	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	13	13	13	12	12	12	11	12	14	11	13	13
Grade (%)		-2%			-1%			-2%			0%	
Storage Length (ft)	0		0	115		0	250		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			100			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		265			338			428			1165	
Travel Time (s)		7.2			9.2			8.3			26.5	
Confl. Peds. (#/hr)							8					8
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	11%	0%	4%	0%	0%	0%	0%	2%	0%	0%	10%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		3.0	28.0	28.0	3.0	28.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		11.0	46.0	46.0	11.0	46.0	
Total Split (s)	27.0	27.0		27.0	27.0		17.0	52.0	52.0	11.0	46.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		18.9%	57.8%	57.8%	12.2%	51.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 23 (26%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 4: King of Prussia Road & Raider Road/Medical Office Driveway

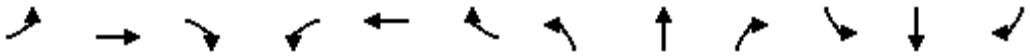




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	130	99	0	22	173	1268	396	79	362	58
Future Volume (veh/h)	9	0	130	99	0	22	173	1268	396	79	362	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	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	1787	1950	1890	1837	1837	1837	1875	1846	1950	1800	1726	1872
Adj Flow Rate, veh/h	12	0	167	127	0	28	222	1626	508	101	464	74
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	11	0	4	0	0	0	0	2	0	0	10	0
Cap, veh/h	52	10	265	255	0	267	504	1099	976	114	830	132
Arrive On Green	0.17	0.00	0.17	0.17	0.00	0.17	0.09	0.60	0.60	0.02	0.19	0.19
Sat Flow, veh/h	56	55	1545	1263	0	1557	1785	1846	1641	1714	1451	231
Grp Volume(v), veh/h	179	0	0	127	0	28	222	1626	508	101	0	538
Grp Sat Flow(s),veh/h/ln	1656	0	0	1263	0	1557	1785	1846	1641	1714	0	1682
Q Serve(g_s), s	1.3	0.0	0.0	3.2	0.0	1.4	4.3	53.6	16.3	5.3	0.0	26.1
Cycle Q Clear(g_c), s	9.0	0.0	0.0	11.7	0.0	1.4	4.3	53.6	16.3	5.3	0.0	26.1
Prop In Lane	0.07		0.93	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	327	0	0	255	0	267	504	1099	976	114	0	962
V/C Ratio(X)	0.55	0.00	0.00	0.50	0.00	0.10	0.44	1.48	0.52	0.88	0.00	0.56
Avail Cap(c_a), veh/h	446	0	0	347	0	381	582	1099	976	114	0	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	0.0	36.2	0.0	31.4	10.7	18.2	10.7	43.7	0.0	26.2
Incr Delay (d2), s/veh	1.4	0.0	0.0	1.5	0.0	0.2	0.6	221.0	2.0	50.0	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	0.0	0.0	5.0	0.0	0.9	2.6	132.1	9.6	7.0	0.0	18.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	0.0	0.0	37.7	0.0	31.6	11.3	239.2	12.7	93.7	0.0	28.6
LnGrp LOS	D	A	A	D	A	C	B	F	B	F	A	C
Approach Vol, veh/h		179			155			2356			639	
Approach Delay, s/veh		36.0			36.6			168.9			38.9	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	58.6		20.4	13.1	56.5		20.4				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	46.0		21.0	11.0	40.0		21.0				
Max Q Clear Time (g_c+I1), s	7.8	56.1		11.0	6.8	28.1		14.2				
Green Ext Time (p_c), s	0.0	0.0		0.5	0.3	6.3		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			130.6									
HCM 6th LOS			F									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	539	141	96	692	14	38	0	28	1	0	0
Future Volume (vph)	3	539	141	96	692	14	38	0	28	1	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	12	10	12	12	12	12	12	15	15	15
Grade (%)		-4%			3%			-3%			-7%	
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		663			1165			255			210	
Travel Time (s)		12.9			22.7			7.0			5.7	
Confl. Peds. (#/hr)	3		1	1		3						
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	4%	9%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	539	141	96	692	14	38	0	28	1	0	0
Future Vol, veh/h	3	539	141	96	692	14	38	0	28	1	0	0
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-4	-	-	3	-	-	-3	-	-	-7	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	4	9	0	0	0	0	0	0
Mvmt Flow	3	586	153	104	752	15	41	0	30	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	770	0	0	740	0	0	1561	1571	587	1655	1717	763
Stage 1	-	-	-	-	-	-	593	593	-	971	971	-
Stage 2	-	-	-	-	-	-	968	978	-	684	746	-
Critical Hdwy	4.3	-	-	4.3	-	-	6.5	5.9	5.9	5.7	5.1	5.5
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	648	-	-	664	-	-	128	145	565	161	177	494
Stage 1	-	-	-	-	-	-	615	548	-	493	487	-
Stage 2	-	-	-	-	-	-	398	390	-	645	566	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	646	-	-	663	-	-	100	104	564	119	127	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	104	-	119	127	-
Stage 1	-	-	-	-	-	-	609	543	-	487	352	-
Stage 2	-	-	-	-	-	-	289	282	-	605	561	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.4	42	35.5
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	100	564	646	-	-	663	-	-	119
HCM Lane V/C Ratio	0.413	0.054	0.005	-	-	0.157	-	-	0.009
HCM Control Delay (s)	64.3	11.7	10.6	0	-	11.4	0	-	35.5
HCM Lane LOS	F	B	B	A	-	B	A	-	E
HCM 95th %tile Q(veh)	1.7	0.2	0	-	-	0.6	-	-	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	6	425	76	23	418
Future Volume (vph)	21	6	425	76	23	418
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	14	10	14	14
Grade (%)	1%		3%			1%
Storage Length (ft)	0	0		100	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Link Speed (mph)	25		35			35
Link Distance (ft)	241		815			452
Travel Time (s)	6.6		15.9			8.8
Confl. Peds. (#/hr)				89	89	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	20%	0%	3%	0%	0%	4%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	6	425	76	23	418
Future Vol, veh/h	21	6	425	76	23	418
Conflicting Peds, #/hr	0	0	0	89	89	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	1	-	3	-	-	1
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	20	0	3	0	0	4
Mvmt Flow	27	8	552	99	30	543

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1244	641	0	0	740	0
Stage 1	641	-	-	-	-	-
Stage 2	603	-	-	-	-	-
Critical Hdwy	6.7	6.3	-	-	4.3	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.1	3.1	-	-	3	-
Pot Cap-1 Maneuver	187	492	-	-	664	-
Stage 1	538	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	154	436	-	-	589	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	523	-	-	-	-	-

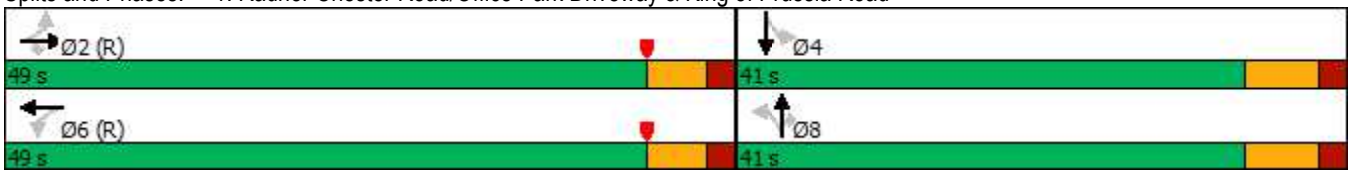
Approach	WB	NB	SB
HCM Control Delay, s	29.8	0	0.6
HCM LOS	D		

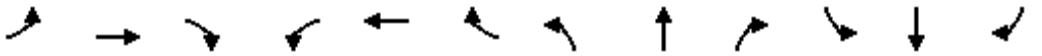
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	180	589	-
HCM Lane V/C Ratio	-	-	0.195	0.051	-
HCM Control Delay (s)	-	-	29.8	11.4	0
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	827	670	68	662	1	416	7	144	31	37	49
Future Volume (vph)	8	827	670	68	662	1	416	7	144	31	37	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	10	11	11	10	10	14	12	12	12
Grade (%)		-1%			2%			-1%			-6%	
Storage Length (ft)	75		125	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	75			75			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		336			663			452			303	
Travel Time (s)		6.5			12.9			8.8			8.3	
Confl. Peds. (#/hr)	11					11	1		22	22		1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	1%	1%	1%	14%	14%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Detector Phase	2	2	2	6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	49.0	49.0	49.0	49.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (s)	49.0	49.0	49.0	49.0	49.0		41.0	41.0	41.0	41.0	41.0	
Total Split (%)	54.4%	54.4%	54.4%	54.4%	54.4%		45.6%	45.6%	45.6%	45.6%	45.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0			-1.0	-1.0		-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 20 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Radnor Chester Road/Office Park Driveway & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	827	670	68	662	1	416	7	144	31	37	49
Future Volume (veh/h)	8	827	670	68	662	1	416	7	144	31	37	49
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		0.97	1.00		0.97	1.00		0.97
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	1823	1823	1911	1764	1764	1764	1638	1638	1896	1981	1981	1981
Adj Flow Rate, veh/h	8	853	0	70	682	1	429	7	96	32	38	35
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, %	1	1	0	1	1	1	14	14	1	3	3	3
Cap, veh/h	435	891		105	861	1	278	3	607	52	62	31
Arrive On Green	0.49	0.49	0.00	0.98	0.98	0.98	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	777	1823	1619	644	1760	3	512	8	1561	0	160	80
Grp Volume(v), veh/h	8	853	0	70	0	683	436	0	96	105	0	0
Grp Sat Flow(s),veh/h/ln	777	1823	1619	644	0	1763	520	0	1561	241	0	0
Q Serve(g_s), s	0.5	40.4	0.0	3.6	0.0	3.4	0.0	0.0	3.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.4	40.4	0.0	44.0	0.0	3.4	35.0	0.0	3.6	35.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.98		1.00	0.30		0.33
Lane Grp Cap(c), veh/h	435	891		105	0	862	282	0	607	146	0	0
V/C Ratio(X)	0.02	0.96		0.66	0.00	0.79	1.55	0.00	0.16	0.72	0.00	0.00
Avail Cap(c_a), veh/h	435	891		105	0	862	282	0	607	146	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.4	22.1	0.0	22.4	0.0	0.5	32.4	0.0	17.9	23.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	21.4	0.0	28.4	0.0	7.4	263.7	0.0	0.1	15.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	28.3	0.0	3.9	0.0	3.7	44.1	0.0	2.3	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	43.5	0.0	50.8	0.0	7.9	296.1	0.0	18.0	38.8	0.0	0.0
LnGrp LOS	B	D		D	A	A	F	A	B	D	A	A
Approach Vol, veh/h		861	A		753			532			105	
Approach Delay, s/veh		43.2			11.9			245.9			38.8	
Approach LOS		D			B			F			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		41.0		49.0		41.0				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		43.0		34.0		43.0		34.0				
Max Q Clear Time (g_c+I1), s		42.9		37.0		46.5		37.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		80.4
HCM 6th LOS		F

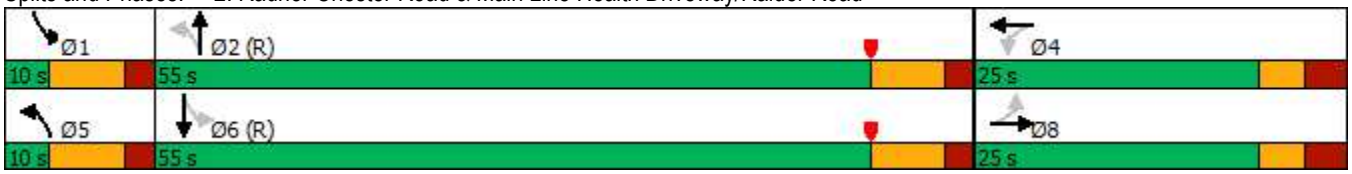
Notes

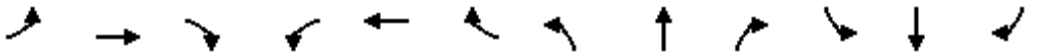
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	69	84	0	6	28	323	80	12	678	3
Future Volume (vph)	30	0	69	84	0	6	28	323	80	12	678	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	11	13	13	11	13	13	11	11	11
Grade (%)		-2%			-2%			5%			-6%	
Storage Length (ft)	175		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			75			25			100		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		317			560			921			815	
Travel Time (s)		8.6			15.3			17.9			15.9	
Confl. Peds. (#/hr)			1	1			3		1	1		3
Confl. Bikes (#/hr)									3			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	45.0		10.0	45.0	
Total Split (s)	25.0	25.0		25.0	25.0		10.0	55.0		10.0	55.0	
Total Split (%)	27.8%	27.8%		27.8%	27.8%		11.1%	61.1%		11.1%	61.1%	
Yellow Time (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 83 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Radnor Chester Road & Main Line Health Driveway/Raider Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	69	84	0	6	28	323	80	12	678	3
Future Volume (veh/h)	30	0	69	84	0	6	28	323	80	12	678	3
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		0.98	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	1875	1875	1875	1875	1950	1950	1660	1712	1698	2024	2009	2024
Adj Flow Rate, veh/h	32	0	45	90	0	6	30	347	76	13	729	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	2	0	1	0
Cap, veh/h	261	0	193	226	0	201	574	905	198	736	1322	4
Arrive On Green	0.12	0.00	0.12	0.12	0.00	0.12	0.03	0.67	0.67	0.04	1.00	1.00
Sat Flow, veh/h	1485	0	1582	1435	0	1645	1581	1354	297	1927	2003	5
Grp Volume(v), veh/h	32	0	45	90	0	6	30	0	423	13	0	731
Grp Sat Flow(s),veh/h/ln	1485	0	1582	1435	0	1645	1581	0	1650	1927	0	2008
Q Serve(g_s), s	1.7	0.0	2.3	5.4	0.0	0.3	0.5	0.0	10.3	0.2	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	2.3	7.2	0.0	0.3	0.5	0.0	10.3	0.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.00
Lane Grp Cap(c), veh/h	261	0	193	226	0	201	574	0	1104	736	0	1326
V/C Ratio(X)	0.12	0.00	0.23	0.40	0.00	0.03	0.05	0.00	0.38	0.02	0.00	0.55
Avail Cap(c_a), veh/h	410	0	352	370	0	366	598	0	1104	782	0	1326
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	35.7	38.7	0.0	34.8	4.4	0.0	6.6	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	1.1	0.0	0.1	0.0	0.0	1.0	0.0	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.0	1.7	3.5	0.0	0.2	0.3	0.0	5.9	0.1	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	0.0	36.3	39.9	0.0	34.9	4.5	0.0	7.7	5.0	0.0	1.7
LnGrp LOS	D	A	D	D	A	C	A	A	A	A	A	A
Approach Vol, veh/h		77			96			453			744	
Approach Delay, s/veh		36.0			39.5			7.4			1.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	66.2		16.0	8.6	65.4		16.0				
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0				
Max Green Setting (Gmax), s	3.0	48.0		19.0	3.0	48.0		19.0				
Max Q Clear Time (g_c+I1), s	2.7	0.0		9.7	3.0	0.0		4.3				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		8.2	
HCM 6th LOS		A	

Notes

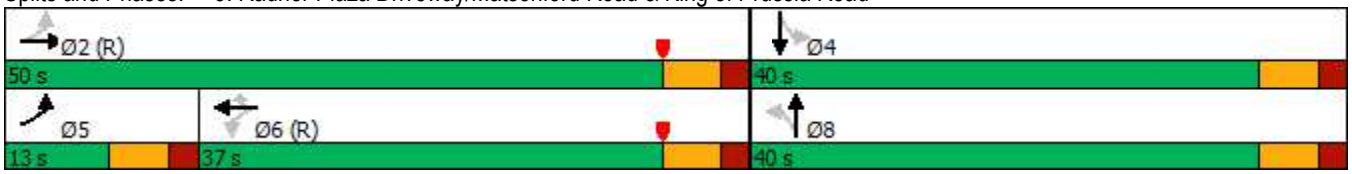
User approved pedestrian interval to be less than phase max green.

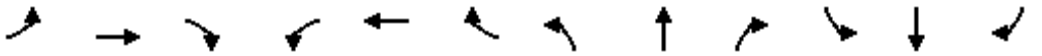
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	803	1	7	647	374	3	4	9	564	1	216
Future Volume (vph)	120	803	1	7	647	374	3	4	9	564	1	216
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	14	14	12	12	14	12	11	11	11	13	13
Grade (%)		2%			3%			6%			-2%	
Storage Length (ft)	100		0	115		285	0		0	350		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	175			50			25			275		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		469			884			278			1080	
Travel Time (s)		9.1			17.2			7.6			21.0	
Confl. Peds. (#/hr)			2	2					2	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	17.0		17.0	17.0	17.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	44.0		29.0	29.0	29.0	34.0	34.0		34.0	34.0	
Total Split (s)	13.0	50.0		37.0	37.0	37.0	40.0	40.0		40.0	40.0	
Total Split (%)	14.4%	55.6%		41.1%	41.1%	41.1%	44.4%	44.4%		44.4%	44.4%	
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	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 44 (49%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 3: Radnor Plaza Driveway/Matsonford Road & King of Prussia Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	803	1	7	647	374	3	4	9	564	1	216
Future Volume (veh/h)	120	803	1	7	647	374	3	4	9	564	1	216
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1778	1849	1849	1750	1750	1791	1599	1599	1599	1860	1950	1950
Adj Flow Rate, veh/h	130	873	1	8	703	0	3	4	10	613	1	158
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	2	0	0	0	1	0	0
Cap, veh/h	216	923	1	116	637		444	157	393	649	4	637
Arrive On Green	0.08	0.50	0.50	0.36	0.36	0.00	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1693	1846	2	626	1750	1517	1106	404	1010	1466	10	1639
Grp Volume(v), veh/h	130	0	874	8	703	0	3	0	14	613	0	159
Grp Sat Flow(s),veh/h/ln	1693	0	1848	626	1750	1517	1106	0	1414	1466	0	1649
Q Serve(g_s), s	4.0	0.0	40.4	1.1	32.8	0.0	0.2	0.0	0.5	35.0	0.0	5.9
Cycle Q Clear(g_c), s	4.0	0.0	40.4	28.7	32.8	0.0	5.5	0.0	0.5	35.0	0.0	5.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.71	1.00		0.99
Lane Grp Cap(c), veh/h	216	0	924	116	637		444	0	550	649	0	641
V/C Ratio(X)	0.60	0.00	0.95	0.07	1.10		0.01	0.00	0.03	0.94	0.00	0.25
Avail Cap(c_a), veh/h	230	0	924	116	637		444	0	550	649	0	641
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	21.3	40.5	28.6	0.0	20.3	0.0	17.0	28.8	0.0	18.6
Incr Delay (d2), s/veh	3.9	0.0	19.1	1.2	67.2	0.0	0.0	0.0	0.0	23.0	0.0	0.4
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	3.0	0.0	27.9	0.4	35.1	0.0	0.1	0.0	0.3	23.7	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	40.4	41.7	95.8	0.0	20.3	0.0	17.0	51.8	0.0	19.0
LnGrp LOS	C	A	D	D	F		C	A	B	D	A	B
Approach Vol, veh/h		1004			711	A		17			772	
Approach Delay, s/veh		38.3			95.2			17.6			45.0	
Approach LOS		D			F			B			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		50.0		40.0	12.2	37.8		40.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		44.0		34.0	7.0	31.0		34.0				
Max Q Clear Time (g_c+I1), s		42.4		37.5	6.5	35.3		8.0				
Green Ext Time (p_c), s		1.5		0.0	0.0	0.0		0.2				

Intersection Summary		
HCM 6th Ctrl Delay	56.4	
HCM 6th LOS	E	

Notes

User approved pedestrian interval to be less than phase max green.

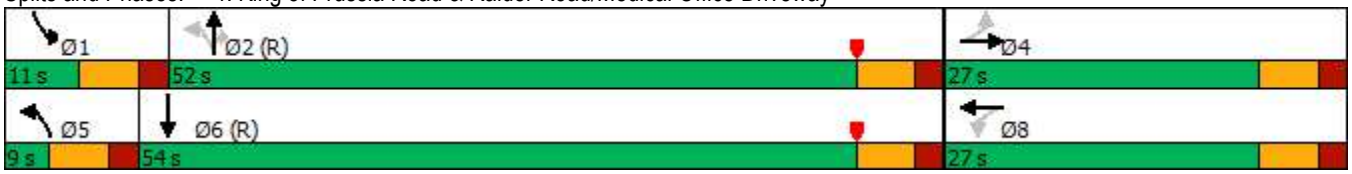
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

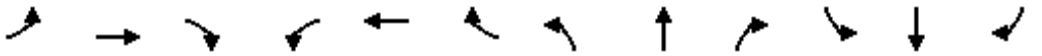
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	41	272	0	60	23	394	106	19	1341	5
Future Volume (vph)	5	0	41	272	0	60	23	394	106	19	1341	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	13	13	13	12	12	12	11	12	14	11	13	13
Grade (%)		-2%			-1%			-2%			0%	
Storage Length (ft)	0		0	115		0	250		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			100			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		265			338			428			1165	
Travel Time (s)		7.2			9.2			8.3			26.5	
Confl. Peds. (#/hr)							3					3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		3.0	28.0	28.0	3.0	28.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		9.0	46.0	46.0	11.0	46.0	
Total Split (s)	27.0	27.0		27.0	27.0		9.0	52.0	52.0	11.0	54.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		10.0%	57.8%	57.8%	12.2%	60.0%	
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	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 4: King of Prussia Road & Raider Road/Medical Office Driveway

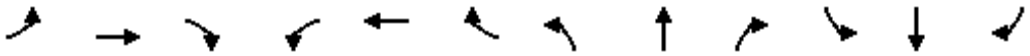




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	41	272	0	60	23	394	106	19	1341	5
Future Volume (veh/h)	5	0	41	272	0	60	23	394	106	19	1341	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1950	1950	1950	1837	1837	1837	1875	1860	1950	1800	1857	1872
Adj Flow Rate, veh/h	5	0	44	289	0	64	24	419	113	20	1427	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	0	0	1	0
Cap, veh/h	61	23	347	415	0	363	129	1067	945	46	1062	4
Arrive On Green	0.23	0.00	0.23	0.23	0.00	0.23	0.03	0.57	0.57	0.03	0.57	0.57
Sat Flow, veh/h	72	97	1489	1413	0	1557	1785	1860	1648	1714	1850	6
Grp Volume(v), veh/h	49	0	0	289	0	64	24	419	113	20	0	1432
Grp Sat Flow(s),veh/h/ln	1658	0	0	1413	0	1557	1785	1860	1648	1714	0	1856
Q Serve(g_s), s	0.0	0.0	0.0	15.7	0.0	3.0	0.5	11.2	2.8	1.0	0.0	51.7
Cycle Q Clear(g_c), s	2.1	0.0	0.0	17.3	0.0	3.0	0.5	11.2	2.8	1.0	0.0	51.7
Prop In Lane	0.10		0.90	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	430	0	0	415	0	363	129	1067	945	46	0	1066
V/C Ratio(X)	0.11	0.00	0.00	0.70	0.00	0.18	0.19	0.39	0.12	0.44	0.00	1.34
Avail Cap(c_a), veh/h	449	0	0	431	0	381	162	1067	945	114	0	1066
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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	32.9	0.0	27.6	22.1	10.6	8.8	43.1	0.0	19.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	4.6	0.0	0.2	0.7	1.1	0.3	6.5	0.0	160.9
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	1.5	0.0	0.0	10.7	0.0	2.0	0.5	7.8	1.8	0.9	0.0	99.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	0.0	37.6	0.0	27.8	22.8	11.6	9.0	49.7	0.0	180.1
LnGrp LOS	C	A	A	D	A	C	C	B	A	D	A	F
Approach Vol, veh/h		49			353			556			1452	
Approach Delay, s/veh		27.4			35.8			11.6			178.3	
Approach LOS		C			D			B			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	56.6		26.0	7.4	56.7		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	46.0		21.0	3.0	48.0		21.0				
Max Q Clear Time (g_c+I1), s	3.5	13.7		4.1	3.0	53.7		19.8				
Green Ext Time (p_c), s	0.0	10.4		0.1	0.0	0.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		115.9	
HCM 6th LOS		F	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	507	59	35	796	10	140	0	111	18	0	4
Future Volume (vph)	1	507	59	35	796	10	140	0	111	18	0	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	12	10	12	12	12	12	12	15	15	15
Grade (%)		-4%			3%			-3%			-7%	
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		663			1165			255			183	
Travel Time (s)		12.9			22.7			7.0			5.0	
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	8%	25%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	28.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	507	59	35	796	10	140	0	111	18	0	4
Future Vol, veh/h	1	507	59	35	796	10	140	0	111	18	0	4
Conflicting Peds, #/hr	1	0	1	1	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	90	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-4	-	-	3	-	-	-3	-	-	-7	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	8	25	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	583	68	40	915	11	161	0	128	21	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	927	0	0	652	0	0	1589	1593	584	1685	1656	922
Stage 1	-	-	-	-	-	-	586	586	-	1002	1002	-
Stage 2	-	-	-	-	-	-	1003	1007	-	683	654	-
Critical Hdwy	4.3	-	-	4.3	-	-	6.5	5.9	5.9	5.7	5.1	5.5
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.9	-	4.7	4.1	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	569	-	-	714	-	-	~ 123	141	567	155	189	411
Stage 1	-	-	-	-	-	-	620	552	-	478	477	-
Stage 2	-	-	-	-	-	-	382	380	-	645	601	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	568	-	-	713	-	-	~ 110	124	566	109	166	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 110	124	-	109	166	-
Stage 1	-	-	-	-	-	-	618	550	-	476	421	-
Stage 2	-	-	-	-	-	-	334	336	-	498	599	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	185.4	40.6
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	110	566	568	-	-	713	-	-	126
HCM Lane V/C Ratio	1.463	0.225	0.002	-	-	0.056	-	-	0.201
HCM Control Delay (s)	$ 321.9	13.2	11.4	0	-	10.4	0	-	40.6
HCM Lane LOS	F	B	B	A	-	B	A	-	E
HCM 95th %tile Q(veh)	11.6	0.9	0	-	-	0.2	-	-	0.7

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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	76	22	363	29	11	605
Future Volume (vph)	76	22	363	29	11	605
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	14	10	14	14
Grade (%)	1%		3%			1%
Storage Length (ft)	0	0		100	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Link Speed (mph)	25		35			35
Link Distance (ft)	241		815			452
Travel Time (s)	6.6		15.9			8.8
Confl. Peds. (#/hr)				1	1	
Confl. Bikes (#/hr)		1		1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	20%	1%	20%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	22	363	29	11	605
Future Vol, veh/h	76	22	363	29	11	605
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	1	-	3	-	-	1
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	20	1	20	0	1
Mvmt Flow	84	24	399	32	12	665

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1089	400	0	0	432	0
Stage 1	400	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.3	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3	3.2	-	-	3	-
Pot Cap-1 Maneuver	248	657	-	-	853	-
Stage 1	757	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	242	656	-	-	852	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	528	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.4	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	282	852	-
HCM Lane V/C Ratio	-	-	0.382	0.014	-
HCM Control Delay (s)	-	-	25.4	9.3	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	1.7	0	-

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

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

where:

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

LEFT TURN FROM MAJOR ROADWAY - TWO LANES ($t_{c,\,base}$ = 4.3)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
1	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
7	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
8	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
10	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

LEFT TURN FROM MINOR ROADWAY - TWO LANES - 4-LEG INTERSECTION ($t_{c,\,base}$ = 7.1)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	7.1	6.9	7.3	6.7	7.5	6.5	7.7	6.3	7.9	6.1	8.1	5.9	8.3	5.7	8.5	5.5	8.7	5.3	8.9	5.1	9.1
1	7.1	6.9	7.3	6.7	7.5	6.5	7.7	6.3	7.9	6.1	8.1	5.9	8.3	5.7	8.5	5.5	8.7	5.3	8.9	5.1	9.1
2	7.1	6.9	7.3	6.7	7.5	6.5	7.7	6.3	7.9	6.1	8.1	5.9	8.3	5.7	8.5	5.5	8.7	5.3	8.9	5.1	9.1
3	7.1	6.9	7.3	6.7	7.5	6.5	7.7	6.3	7.9	6.1	8.1	5.9	8.3	5.7	8.5	5.5	8.7	5.3	8.9	5.1	9.1
4	7.1	6.9	7.3	6.7	7.5	6.5	7.7	6.3	7.9	6.1	8.1	5.9	8.3	5.7	8.5	5.5	8.7	5.3	8.9	5.1	9.1
5	7.2	7.0	7.4	6.8	7.6	6.6	7.8	6.4	8.0	6.2	8.2	6.0	8.4	5.8	8.6	5.6	8.8	5.4	9.0	5.2	9.2
6	7.2	7.0	7.4	6.8	7.6	6.6	7.8	6.4	8.0	6.2	8.2	6.0	8.4	5.8	8.6	5.6	8.8	5.4	9.0	5.2	9.2
7	7.2	7.0	7.4	6.8	7.6	6.6	7.8	6.4	8.0	6.2	8.2	6.0	8.4	5.8	8.6	5.6	8.8	5.4	9.0	5.2	9.2
8	7.2	7.0	7.4	6.8	7.6	6.6	7.8	6.4	8.0	6.2	8.2	6.0	8.4	5.8	8.6	5.6	8.8	5.4	9.0	5.2	9.2
9	7.2	7.0	7.4	6.8	7.6	6.6	7.8	6.4	8.0	6.2	8.2	6.0	8.4	5.8	8.6	5.6	8.8	5.4	9.0	5.2	9.2
10	7.2	7.0	7.4	6.8	7.6	6.6	7.8	6.4	8.0	6.2	8.2	6.0	8.4	5.8	8.6	5.6	8.8	5.4	9.0	5.2	9.2

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

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

RIGHT TURN FROM MINOR ROADWAY - TWO LANES ($t_{c,\,base}$ = 6.2)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
1	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
2	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
3	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
4	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
5	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
6	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
7	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
8	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
9	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
10	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3

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

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

where:

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

LEFT TURN FROM MAJOR ROADWAY - TWO LANES ($t_{c,\,base}$ = 4.3)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
1	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
7	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
8	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
10	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

LEFT TURN FROM MINOR ROADWAY - TWO LANES - 3-LEG INTERSECTION ($t_{c,\,base}$ = 7.1)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	6.4	6.2	6.6	6.0	6.8	5.8	7.0	5.6	7.2	5.4	7.4	5.2	7.6	5.0	7.8	4.8	8.0	4.6	8.2	4.4	8.4
1	6.4	6.2	6.6	6.0	6.8	5.8	7.0	5.6	7.2	5.4	7.4	5.2	7.6	5.0	7.8	4.8	8.0	4.6	8.2	4.4	8.4
2	6.4	6.2	6.6	6.0	6.8	5.8	7.0	5.6	7.2	5.4	7.4	5.2	7.6	5.0	7.8	4.8	8.0	4.6	8.2	4.4	8.4
3	6.4	6.2	6.6	6.0	6.8	5.8	7.0	5.6	7.2	5.4	7.4	5.2	7.6	5.0	7.8	4.8	8.0	4.6	8.2	4.4	8.4
4	6.4	6.2	6.6	6.0	6.8	5.8	7.0	5.6	7.2	5.4	7.4	5.2	7.6	5.0	7.8	4.8	8.0	4.6	8.2	4.4	8.4
5	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
6	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
7	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
8	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
9	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5
10	6.5	6.3	6.7	6.1	6.9	5.9	7.1	5.7	7.3	5.5	7.5	5.3	7.7	5.1	7.9	4.9	8.1	4.7	8.3	4.5	8.5

RIGHT TURN FROM MINOR ROADWAY - TWO LANES ($t_{c,\,base}$ = 6.2)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
1	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
2	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
3	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
4	6.2	6.1	6.3	6.0	6.4	5.9	6.5	5.8	6.6	5.7	6.7	5.6	6.8	5.5	6.9	5.4	7.0	5.3	7.1	5.2	7.2
5	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
6	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
7	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
8	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
9	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3
10	6.3	6.2	6.4	6.1	6.5	6.0	6.6	5.9	6.7	5.8	6.8	5.7	6.9	5.6	7.0	5.5	7.1	5.4	7.2	5.3	7.3

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

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

where:

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

LEFT TURN FROM MAJOR ROADWAY - TWO LANES ($t_{f,\,base}$ = 3.0)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
7	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
8	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
10	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1

LEFT TURN FROM MINOR ROADWAY - TWO LANES ($t_{f,\,base}$ = 3.0)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
7	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
8	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
10	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1

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

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

RIGHT TURN FROM MINOR ROADWAY - TWO LANES ($t_{f,\,base}$ = 3.1)

GRADE	0	-1	1	-2	2	-3	3	-4	4	-5	5	-6	6	-7	7	-8	8	-9	9	-10	10
HV %																					
0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
4	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
5	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
6	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
7	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
8	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
9	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
10	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Appendix G

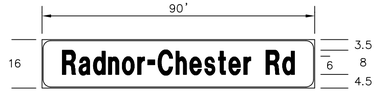
Traffic Signal Plans

SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R5-1	30"x30"	DO NOT ENTER
B	R9-3	18"x18"	NO PEDESTRIAN CROSSING
C	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
D	R3-7R	30"x30"	RIGHT LANE MUST TURN RIGHT
E	R10-3E(L)	9"X15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIMER SIGN
F	R3-8LSRB	30"x30"	LANE USE CONTROL
G	R5-9	36"x24"	WRONG WAY
J	OM1-3	18"x18"	OBJECT MARKER
L	D3-4	90"x16"	RADNOR-CHESTER RD
M	R1-2	36"x36"	YIELD
N	D3-4	96"x16"	KING OF PRUSSIA RD

MISCELLANEOUS

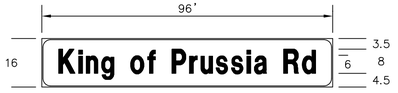
ITEM NO.	QUAN.	UNIT	DESCRIPTION	LOCATION
0955-3722	4	EACH	LED COUNTDOWN PEDESTIRAN SIGNAL HEAD, TYPE A	SEE PLAN
0956-0500	4	EACH	PEDESTRIAN PUSHBUTTON	SEE PLAN

Sign "L"



HELVETICA BOLD (30% REDUCTION)
8" U.C.
6" L.C.

Sign "N"



HELVETICA BOLD (25% REDUCTION)
8" U.C.
6" L.C.

WEEKLY PROGRAM CHART

EVENT	DAY*	TIME	CYCLE	OFFSET**	PROGRAM	REMARKS
1	1-5	0600	90	74	1	AM PEAK
2	1-5	1000	90	88	2	OFF PEAK
3	1-5	1600	90	20	3	PM PEAK
4	1-5	1900	-	-	FREE	MAX 2
5	1-5	2300	-	-	FREE	MAX 1
6	6,7	0000	-	-	FREE	MAX 1

* DAY 1 = MONDAY

** OFFSETS REFERENCED TO THE BEGINNING OF YELLOW, INTERVAL 3, PHASE 2+6.

MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	2+6				4+8				FLASHING
INTERVAL / SIGNALS	1	2	3	4	5	6	7	8	
1,2,3,4,5	G	G	Y	R	R	R	R	R	Y
6,7,8,9	R	R	R	R	G	G	Y	R	R
10,11	M*	FH*	H	H	H	H	H	H	OFF
12,13	H	H	H	H	M*	FH*	H	H	OFF

FIXED			4	2			5	2
MINIMUM	20				3			
PASSAGE	3				3			
MAXIMUM 1	33				28			
MAXIMUM 2	49				44			
PEDESTRIAN*	7	12			7	14		
MEMORY	MN				NL			
PROGRAM 1	44		4	2	33		5	2
PROGRAM 2	33		4	2	44		5	2
PROGRAM 3	49		4	2	28		5	2

(90 SEC.)
(90 SEC.)
(90 SEC.)

* UPON PEDESTRIAN ACTUATION ONLY, OTHERWISE H AT ALL TIMES.

• PEDESTRIAN COUNTDOWN TIMER TO COUNT DOWN DURING FLASHING HAND INTERVAL.

SIGNAL INDICATIONS

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS: _____

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & LOUVERS: _____

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
6-0	DELAWARE	0030	RRT	5 OF 5
RADNOR TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

TRAFFIC SIGNAL NOTES

DO NOT MODIFY INSTALLATION WITHOUT PRIOR WRITTEN APPROVAL.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ARE PART OF THE PERMIT. INSTALL AND MAINTAIN IN ACCORDANCE WITH PUBLICATION 212 AND PUBLICATION 236.

POST MOUNTED SIGNALS: INSTALL WITH A MINIMUM SIGNAL HEAD CLEARANCE OF 2 FEET BEHIND FACE OF CURB OR EDGE OF SHOULDER; AND 8 FEET ABOVE SIDEWALK OR PAVEMENT GRADE.

OVERHEAD SIGNALS: INSTALL WITH A MINIMUM SIGNAL HEAD CLEARANCE OF 2 FEET BEHIND FACE OF CURB OR EDGE OF SHOULDER. PROVIDE A MINIMUM SIGNAL HEAD CLEARANCE OF 16 FEET ABOVE ROADWAY; RIGIDLY MOUNT, TOP AND BOTTOM : AND EQUIP WITH BACKPLATES. PROVIDE A MINIMUM HORIZONTAL DISTANCE OF 8 FEET BETWEEN SIGNALS AS MEASURED AT RIGHT ANGLES TO THE APPROACH.

DETERMINE WITH A PENNDOT REPRESENTATIVE, THE EXACT LOCATION OF DETECTORS PRIOR TO INSTALLATION.

CONSULT WITH LOCAL OFFICIALS AND UTILITIES TO RESOLVE CONFLICTS PRIOR TO CONSTRUCTION.

COMPLY WITH PROVISIONS OF ACT 287 FOR PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES.

LEGEND

EXISTING	PROPOSED	
4 25' MA	4 25' MA	MAST ARM/ IDENTIFYING LENGTH
4	4	SIGNAL HEAD/TUNNEL VISOR/ IDENTIFYING NUMBER
4	4	PEDESTRIAN SIGNAL HEAD W/ IDENTIFYING NUMBER
4	4	PEDESTRIAN PUSHBUTTON W/ IDENTIFYING NUMBER
A A	A A	SIGN/ IDENTIFYING LETTER
4 6'X20'	4 6' X40'	LOOP SENSOR/SIZE
		CURB RAMP
A1	A1	EMERGENCY PRE-EMPTION DETECTOR
A	A	EMERGENCY PRE-EMPTION FLASHING BEACON
JB4	JB4	CONTROLLER CABINET / JUNCTION BOX
C	C/1"	CONDUIT
DC	DC	DEPRESSED CURB
20' LA L4	20' LA L4	LUMINAIRE/ IDENTIFYING LENGTH
M4	M4	MICROWAVE DETECTOR/ IDENTIFYING NUMBER
V4	V4	VIDEO DETECTOR/ IDENTIFYING NUMBER
4"/DY	4"/DY	4" WIDTH / DOUBLE YELLOW LINE
4"/Y	4"/Y	4" WIDTH / SOLID YELLOW LINE
4"/BY	4"/BY	4" WIDTH / BROKEN YELLOW LINE
4"/BW	4"/BW	4" WIDTH / BROKEN WHITE LINE
4"/DW	4"/DW	4" WIDTH / DASHED WHITE LINE
4"/W	4"/W	4" WIDTH / SOLID WHITE LINE
6"/BW	6"/BW	6" WIDTH / BROKEN WHITE LINE
6"/W	6"/W	6" WIDTH / SOLID WHITE LINE
24"/W	24"/W	24" WIDTH / SOLID WHITE LINE
24"/Y	24"/Y	24" WIDTH / SOLID YELLOW LINE
FENCE / GUIDE RAIL	4	PHASE NUMBER / UTILITY POLE

COUNTY: DELAWARE

MUNICIPALITY: RADNOR TOWNSHIP

INTERSECTION: RADNOR CHESTER ROAD (SR 1021) AND KING OF PRUSSIA ROAD (SR 1021)

REVIEWED:

Docusigned by: Stephen E. Nau 6/30/2020

MUNICIPAL OFFICIAL DATE

RECOMMENDED: Paul M. Lutz Digitally signed by Paul M. Lutz Date: 2020.06.30 08:20:45 -04'00'

Ashwin B. Patel, P.E. Digitally signed by Ashwin B. Patel, P.E. Date: 2020.06.30 11:08:33 -04'00' DATE

DISTRICT TRAFFIC ENGINEER DATE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL WAYNE ALFRED DROESSER ENGINEER No. 060685

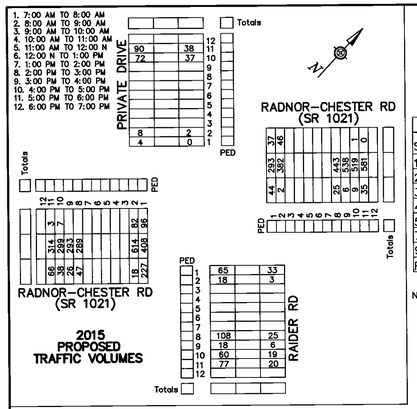
FILE # 1800

25' 0' 25' 50'

SCALE IN FEET

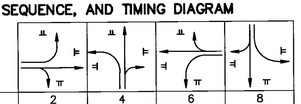
c:\pwworking\projectwise\jdoyle\d0193125\06const - King of Prussia and Radnor Chester Rd.dgn
5/22/2020 10:34:31 AM jdoyle Traffic Planning and Design, Inc.

1. 7:00 AM TO 8:00 AM
2. 8:00 AM TO 9:00 AM
3. 9:00 AM TO 10:00 AM
4. 10:00 AM TO 11:00 AM
5. 11:00 AM TO 12:00 N
6. 12:00 N TO 1:00 PM
7. 1:00 PM TO 2:00 PM
8. 2:00 PM TO 3:00 PM
9. 3:00 PM TO 4:00 PM
10. 4:00 PM TO 5:00 PM
11. 5:00 PM TO 6:00 PM
12. 6:00 PM TO 7:00 PM



2015 PROPOSED TRAFFIC VOLUMES

EMERGENCY PRE-EMPTION PHASING
MOVEMENT, SEQUENCE, AND TIMING DIAGRAM



PHASE	2			4			6			8		
INTERVAL / SIGNALS	20	21	22	23	24	25	26	27	28	29	30	31
1	R	R	R	R	R	R	G/Y	Y	R	R	R	R
2	R	R	R	R	R	R	G	Y	R	R	R	R
3	G/Y	Y	R	R	R	R	R	R	R	R	R	R
4	G	Y	R	R	R	R	R	R	R	R	R	R
5,6	R	R	R	G	Y	R	R	R	R	R	R	R
7,8	R	R	R	R	R	R	R	R	R	G	Y	R
9,10,11,12,13,14	H	H	H	H	H	H	H	H	H	H	H	H
FIXED	▲	5	2	▲	3	3	▲	5	2	▲	3	3

▲ FOR DURATION OF PRE-EMPTION

NOTE: IF PRE-EMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PRE-EMPTION.

ⓐ SIGNAL TO INDICATE G/Y WHEN RETURNING TO NORMAL OPERATION

ⓑ SIGNAL TO INDICATE G WHEN RETURNING TO NORMAL OPERATION

EMERGENCY PRE-EMPTION NOTES

- CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE EASTBOUND AND WESTBOUND APPROACHES OF RADNOR-CHESTER ROAD (S.R. 1021), THE SOUTHBOUND APPROACH OF PRIVATE DRIVEWAY AND THE NORTHBOUND APPROACH OF RAIDER ROAD WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION.
- THIS FAIL SAFE DEVICE 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 THE EMERGENCY VEHICLE DETECTORS ARE TO BE FIELD ADJUSTED TO ACHIEVE MAXIMUM OPERATION.
- THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLES, SHALL TERMINATE ALL INDICATIONS EXCEPT THE GREEN INDICATIONS FOR THE PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE, FOLLOWED BY SELECTIVE CLEARANCES DEPENDENT UPON THE PHASE IN WHICH THE PRE-EMPTION OCCURS. THE GREEN INDICATIONS FOR THE PRE-EMPTED PHASE SHALL REMAIN GREEN FOR THE DURATION OF THE SIGNAL PRE-EMPTION AND RED INDICATIONS DISPLAYED FOR ALL OTHER PHASES.
- THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLES, SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE INTERVAL OF THE PRE-EMPTION PHASE GOVERNED BY THE ACTUATION OF THE APPROACHING PHASE GOVERNING THE EMERGENCY VEHICLE.
- IF THE SIGNALS HAVE BEEN ACTUATED BY PEDESTRIAN PUSHBUTTON, AND THE SIGNAL IS PRE-EMPTED DURING THE "MAN" PHASE, THE MAN PHASE SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE "FLASHING HAND" INDICATION IN ITS ENTIRETY, FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES BEFORE PROCEEDING TO THE PRE-EMPTION PHASE.
- IF THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLES, ARE FLASHING, ALL SIGNALS SHALL REMAIN FLASHING.
- UPON COMPLETION OF PRE-EMPTION PHASE 2,4,6, OR 8, IN RETURNING TO NORMAL OPERATION, PHASE 2+6, INTERVAL 12 SHALL FOLLOW.
- IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.
- IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED, PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.
- THE FIELD LOCATIONS OF THE PRE-EMPTION DETECTORS MAY DIFFER FROM THE LOCATIONS DEPICTED ON THE CONDITION DIAGRAM, AS THE DETECTORS MAY NEED TO BE RELOCATED AND/OR ADJUSTED TO PROVIDE ACCEPTABLE OPERATION AS DEEMED APPROPRIATE BY DEPARTMENT PERSONNEL.

SIGN A

16" × 96"

Radnor-Chester Rd

FONT: CLEARVIEWONE W3
8" UPPERCASE
6" LOWERCASE

SIGN B

16" × 78"

Raider Rd ←

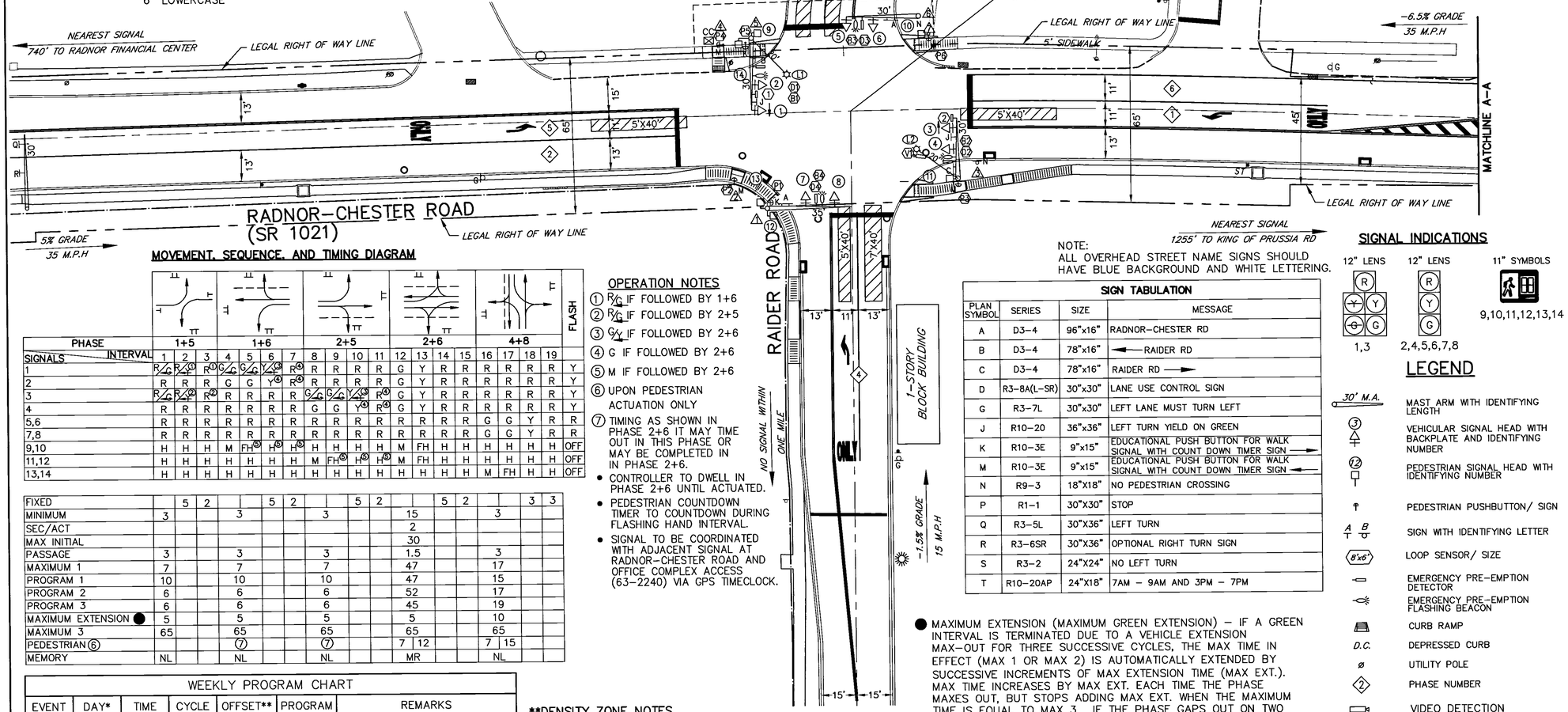
FONT: CLEARVIEWONE W3
8" UPPERCASE
6" LOWERCASE

SIGN C

16" × 78"

Raider Rd →

FONT: CLEARVIEWONE W3
8" UPPERCASE
6" LOWERCASE



MOVEMENT, SEQUENCE, AND TIMING DIAGRAM

PHASE	1+5			1+6				2+5				2+6				4+8				FLASH
INTERVAL / SIGNALS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	R/G	R/Y	R	R/G	G/Y	Y	R	R	R	R	R	G	Y	R	R	R	R	R	R	Y
2	R	R	R	G	G	Y	R	R	R	R	R	G	Y	R	R	R	R	R	R	Y
3	R/G	R/Y	R	R	R	R	R	G/G	G/Y	Y	R	G	Y	R	R	R	R	R	R	Y
4	R	R	R	R	R	R	R	G	G	Y	R	G	Y	R	R	R	R	R	R	Y
5,6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R	R
7,8	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R	R
9,10	H	H	H	M	FH	H	H	H	H	H	H	M	FH	H	H	H	H	H	H	OFF
11,12	H	H	H	H	H	H	H	M	FH	H	H	M	FH	H	H	H	H	H	H	OFF
13,14	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	FH	H	H	OFF
FIXED		5	2			5	2			5	2			5	2			3	3	
MINIMUM	3			3				3				15				3				
SEC/ACT												2								
MAX INITIAL												30								
PASSAGE	3			3				3				1.5				3				
MAXIMUM 1	7			7				7				47				17				
PROGRAM 1	10			10				10				47				15				
PROGRAM 2	6			6				6				52				17				
PROGRAM 3	6			6				6				45				19				
MAXIMUM EXTENSION ●	5			5				5				5				10				
MAXIMUM 3	65			65				65				65				65				
PEDESTRIAN ⑥				⑦				⑦				7 | 12				7 | 15				
MEMORY	NL			NL				NL				MR				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 M IF FOLLOWED BY 2+6
⑥ UPON PEDESTRIAN ACTUATION ONLY
⑦ TIMING AS SHOWN IN PHASE 2+6 IT MAY TIME OUT IN THIS PHASE OR MAY BE COMPLETED IN IN PHASE 2+6.

- CONTROLLER TO DWELL IN PHASE 2+6 UNTIL ACTUATED.
- PEDESTRIAN COUNTDOWN TIMER TO COUNTDOWN DURING FLASHING HAND INTERVAL.
- SIGNAL TO BE COORDINATED WITH ADJACENT SIGNAL AT RADNOR-CHESTER ROAD AND OFFICE COMPLEX ACCESS (63-2240) VIA GPS TIMECLOCK.

NOTE: ALL OVERHEAD STREET NAME SIGNS SHOULD HAVE BLUE BACKGROUND AND WHITE LETTERING.

SIGN TABULATION

PLAN SYMBOL	SERIES	SIZE	MESSAGE
A	D3-4	96"x16"	RADNOR-CHESTER RD
B	D3-4	78"x16"	← RAIDER RD
C	D3-4	78"x16"	RAIDER RD →
D	R3-8A(L-SR)	30"x30"	LANE USE CONTROL SIGN
G	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
J	R10-20	36"x36"	LEFT TURN YIELD ON GREEN
K	R10-3E	9"x15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNT DOWN TIMER SIGN →
M	R10-3E	9"x15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNT DOWN TIMER SIGN ←
N	R9-3	18"X18"	NO PEDESTRIAN CROSSING
P	R1-1	30"X30"	STOP
Q	R3-5L	30"X36"	LEFT TURN
R	R3-6SR	30"X36"	OPTIONAL RIGHT TURN SIGN
S	R3-2	24"X24"	NO LEFT TURN
T	R10-20AP	24"X18"	7AM - 9AM AND 3PM - 7PM

● MAXIMUM EXTENSION (MAXIMUM GREEN EXTENSION) - IF A GREEN INTERVAL IS TERMINATED DUE TO A VEHICLE EXTENSION MAX-OUT FOR THREE SUCCESSIVE CYCLES, THE MAX TIME IN EFFECT (MAX 1 OR MAX 2) IS AUTOMATICALLY EXTENDED BY SUCCESSIVE INCREMENTS OF MAX EXTENSION TIME (MAX EXT.). MAX TIME INCREASES BY MAX EXT. EACH TIME THE PHASE MAXES OUT, BUT STOPS ADDING MAX EXT. WHEN THE MAXIMUM TIME IS EQUAL TO MAX 3. IF THE PHASE GAPS OUT ON TWO SUCCESSIVE CYCLES BEFORE THE MAX TIME REACHES MAX 3, THE MAX TIMER IS AUTOMATICALLY REDUCED BY SUCCESSIVE INCREMENTS OF MAX EXTENSION TIME (MAX EXT.) EACH TIME THE PHASE GAPS OUT AND STOPS REDUCING BY THE MAX EXT WHEN THE MAXIMUM TIME IS EQUAL TO MAX TIME IN EFFECT (MAX 1 OR MAX 2).

SIGNAL INDICATIONS

LEGEND

WEEKLY PROGRAM CHART

EVENT	DAY*	TIME	CYCLE	OFFSET**	PROGRAM	REMARKS
1	1-7	2000	–	–	MAX 1	FREE
2	1-5	0600	90	16	1	AM PEAK
3	1-5	1000	90	87	2	OFF PEAK
4	1-5	1500	90	83	3	PM PEAK
5	6,7	0600	90	87	2	OFF PEAK
6	1-5	0700	90	16	3	SCHOOL AM PEAK

**DENSITY ZONE NOTES
RANGE OF DETECTION: 0 - 100 FEET FROM STOP BAR
SPEED BOUNDARY: MIN. 5 - MAX. 30 MPH

**ADVANCED DILEMMA ZONE NOTES
EST. TIME OF ARRIVAL: MIN. 2.5 - MAX. 5.5 SEC.
RANGE OF PROTECTION: MIN. 0 - MAX. 450 FT.
SPEED BOUNDARY: MIN. 27 - MAX. 100 MPH
* DAY 1 = MONDAY
** OFFSETS ARE REFERENCED TO THE BEGINNING YELLOW, INTERVAL 14.

GENERAL NOTES

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

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED 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 FROM PUB. 408, 2011 AS AMENDED.

ALL ADA RAMPS & PUSH BUTTON ACCESS MUST MEET FEDERAL AND STATE GUIDELINES.

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 10, 1974, AS AMENDED.

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.

THREADED PLATE MAST ARM CONNECTIONS WILL NOT BE PERMITTED FOR THIS TRAFFIC SIGNAL PERMIT.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

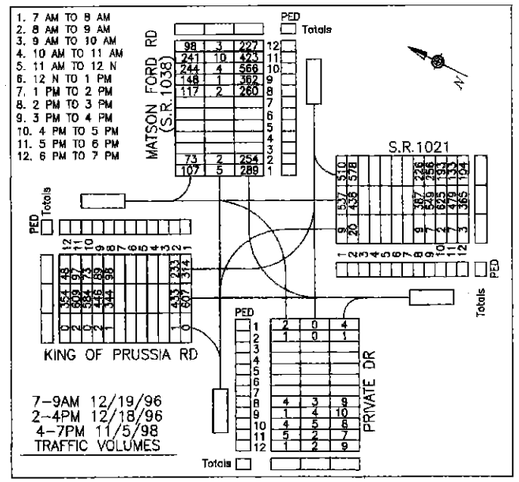
COUNTY: DELAWARE COUNTY
MUNICIPALITY: RADNOR TOWNSHIP
INTERSECTION: RADNOR-CHESTER ROAD (SR 1021) & RAIDER ROAD/PRIVATE DRIVE

REVIEWED:
STEVEN F. NORCINI — 7/28/2015 DATE
ROBERT ZIENKOWSKI — 7/28/2015 DATE
MUNICIPAL OFFICIAL

RECOMMENDED:
PAUL LUTZ — 7/28/2015 DATE
ASHWIN B. PATEL — 7/28/2015 DATE
DISTRICT TRAFFIC ENGINEER

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
	As built plan	G&A	4/4/16	lutz	4/19/16	ashah	4/28/16

SHEET 2 OF 2 | PERMIT # 63-3861 | FILE # 3861

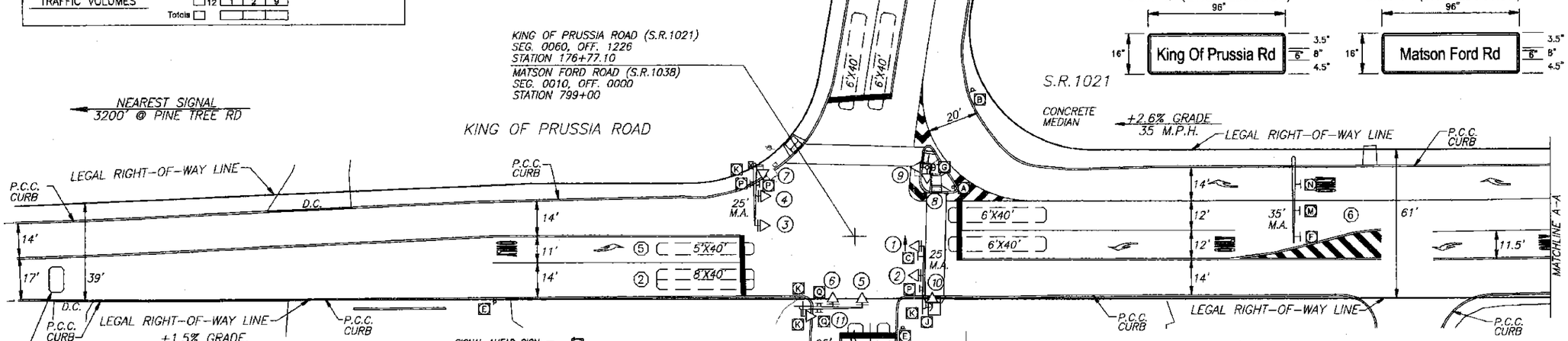


SIGN TABULATION			
PLAN SYMBOL	SERIES	SIZE	MESSAGE
A	W16-1	18"x18"	HAZARD MARKER
B	R1-2	36"x36"	YIELD
C	R10-12	30"x36"	LEFT TURN YIELD ON GREEN •
D	R3-8LSR	30"x30"	LANE USE CONTROL SIGN
E	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
F	R3-5L	30"x36"	LEFT TURN SIGN
G	R10-3	9"x12"	PUSH BUTTON FOR GREEN LIGHT ←
J	R10-3	9"x12"	PUSH BUTTON FOR GREEN LIGHT →
K	R9-3A	18"X18"	NO PEDESTRIAN CROSSING
L	W3-3	36"x36"	SIGNAL AHEAD SIGN
M	R3-5S	30"x36"	STRIAGHT THROUGH SIGN
N	R3-5R	30"x36"	RIGHT TURN SIGN
P	D3-4	96"x16"	STREET SIGN "Matson Ford Rd"
Q	D3-4	96"x16"	STREET SIGN "King Of Prussia Rd"

CLEARVIEW 3W
8" UPPER CASE
6" LOWER CASE LETTERS

SIGN Q (21% REDUCTION) 96" — King Of Prussia Rd — 16" — 3.5" 6" 8" 4.5"

SIGN P (5% REDUCTION) 96" — Matson Ford Rd — 16" — 3.5" 6" 8" 4.5"



OPERATION NOTES

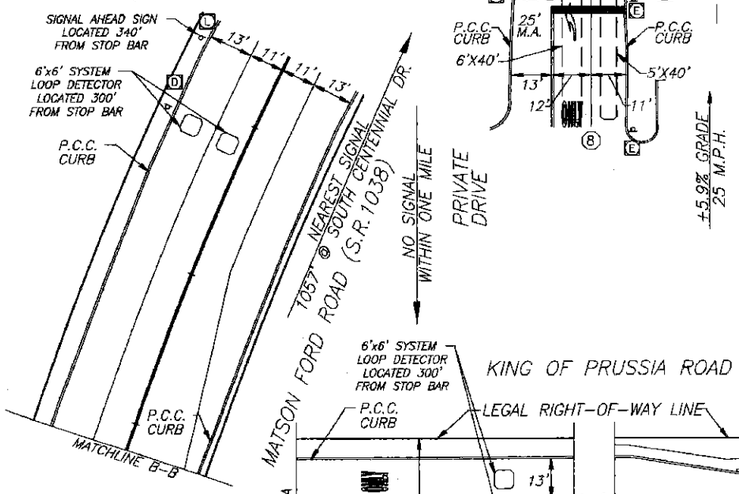
① G IF FOLLOWED BY 2+6
② G IF FOLLOWED BY 2+6
③ UPON PEDESTRIAN ACTUATION ONLY
○ CONTROLLER TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 4+8

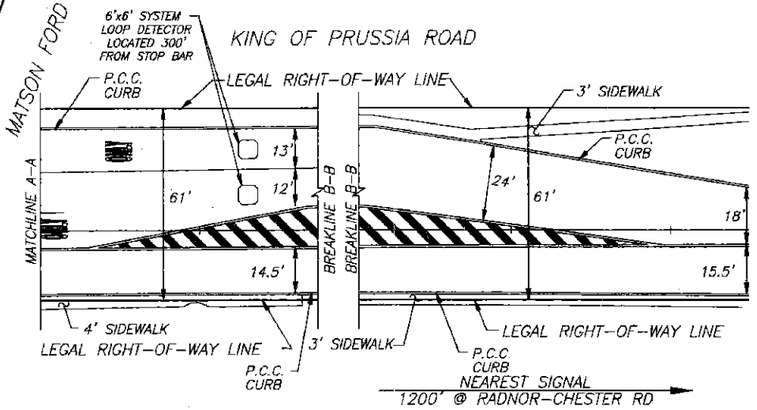
MOVEMENT, SEQUENCE, AND TIMING DIAGRAM

PHASE	2+5			2+6			4+8			FLASH
SIGNAL \ INTERVAL	1	2	3	4	5	6	7	8	9	
1	G①	Y①	R	G	Y	R	R	R	R	Y
2	G	Y	R	G	Y	R	R	R	R	Y
3,4	R	R	R	G	Y	R	R	R	R	Y
5,6,7,8	R	R	R	R	R	R	G	Y	R	R
9	R	R	R	G	Y	R	R	R	R	OFF
10	R	R	R	R	R	R	G	Y	R	OFF
11	G	Y	R	G	Y	R	R	R	R	OFF

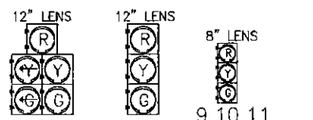
FIXED		4	2		4	2		4	2
MINIMUM	3			17			10		
PASSAGE	3			5			5		
MAXIMUM 1	7			33			20		
MAXIMUM 2	19			35			32		
PEDESTRIAN ③							15		
MEMORY	NL			MR			NL		

• REFER TO SYSTEM PERMIT #I-0010 FOR PROGRAM TIMES AND TIME-OF-DAY OPERATION





SIGNAL INDICATIONS



SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS AND LOUVERS 9,10,11
SIGNALS TO BE EQUIPPED WITH BACKPLATES 1,2,3,4,5,6

SCALE
25 0 25

LEGEND

20'	MAST ARM/ IDENTIFYING LENGTH	12'x6'	LOOP SENSOR/SIZE
①	VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER		ZONE OF DETECTION
			MICROWAVE PRESENCE DETECTOR
①	PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER		EMERGENCY PRE-EMPTION FLASHING BEACON
			EMERGENCY PRE-EMPTION DEVICE
	PEDESTRIAN PUSHBUTTON/ SIGN		CURB RAMP
A	SIGN/IDENTIFYING LETTER	ø	UTILITY POLE
	VIDEO DETECTOR	①	PHASE NUMBER
C.C.	CONTROLLER CABINET		INLET

GENERAL NOTES

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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.

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SYSTEM PERMIT # I-0010

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: DELAWARE
MUNICIPALITY: RADNOR TOWNSHIP
INTERSECTION: KING OF PRUSSIA ROAD (S.R. 1021)
& MATSON FORD ROAD (S.R. 1038)/PRIVATE DRIVE

REVIEWED: _____ DATE
MUNICIPAL OFFICIAL _____ DATE

RECOMMENDED:

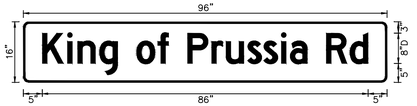
WERNER J. EICHORN 4-8-86
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	NEW DWG. ADDED C.S. OSN, REV. EG. x-WALKS/SIGNALS, PB. YIELD SIGNS, ELIMINATED RT SIGNAL AND WEG SIGN	NV	3/3/00	RP MK	3/8/00 3/8/00	WJE	3/10/00
2	REVISED PMP-ONE LANE EB DEPARTURE	TPD REW	6/12/01	MK	6/15/01	WJE	6/19/01
3	REVISED CURB RAMPS, PEDESTRIAN BUTTONS AND PEDESTRIAN TIMES	MCM	6/13/12	WJC	6/12/12		7/16/12
4							
5							
6							
7							

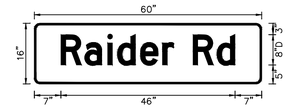
SHEET 2 OF 2 | PERMIT # 63-0890 | FILE # 0890

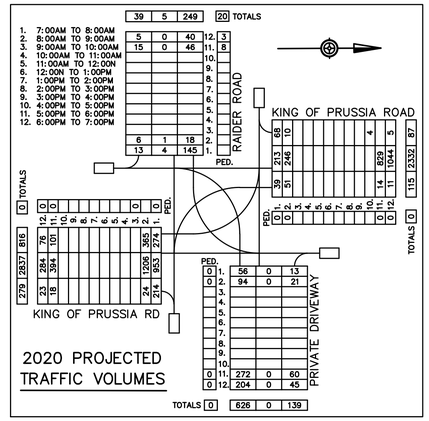
SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R3-7L	30"x30"	LEFT LANE MUST TURN LEFT
B	R3-7R	30"x30"	RIGHT LANE MUST TURN RIGHT
C	R10-3E(L)	9"x15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIMER ←
D	R10-3E(R)	9"x15"	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIMER →
E	R10-10L	30"x36"	LEFT TURN SIGNAL
F	R10-11	30"x36"	NO TURN ON RED
G	R10-12	30"x36"	LEFT TURN YIELD ON GREEN
J	R3-8B	48"x30"	LANE USE CONTROL SIGN (L-S-R)
K	D3-4	96"x16"	KING OF PRUSSIA RD
L	D3-4	60x16"	RAIDER RD
M	W3-3	36x36"	SIGNAL AHEAD

FONT : D 2000
13% REDUCTION
8" UPPER CASE
6" LOWER CASE



FONT : D 2000
8" UPPER CASE
6" LOWER CASE





SIGNAL INDICATIONS

OPERATION NOTE:

- PEDESTRIAN COUNTDOWN TIMER TO COUNTDOWN DURING FLASHING HAND INTERVAL.

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS _____

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & LOUVERS _____

25 0 25

LEGEND

- 20' MAST ARM/ IDENTIFYING LENGTH
- (2) VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER
- (2) PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER
- PEDESTRIAN PUSHBUTTON/ SIGN
- (A) SIGN/IDENTIFYING LETTER
- 12'x6' ZONE OF DETECTION
- ADVANCED DILEMMA/DENSITY RADAR DETECTOR
- EMERGENCY PREEMPTION BEACON
- EMERGENCY PREEMPTION DETECTOR
- CURB CUT RAMP
- UTILITY POLE
- (2) PHASE NUMBER
- INLET
- VIDEO DETECTION CAMERA

GENERAL NOTES

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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 MEASUREDAT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

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

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT 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.

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

SYSTEM PERMIT # I-0010

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: DELAWARE
MUNICIPALITY: RADNOR TOWNSHIP
INTERSECTION: KING OF PRUSSIA ROAD AND RAIDER ROAD

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

DATE

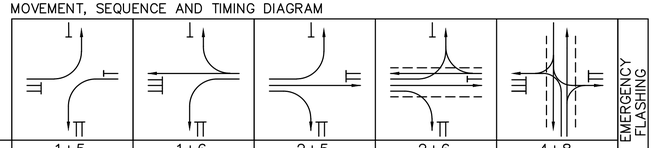
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
1							
2							
3							
4							
5							
6							
7							
8							

SHEET 2 OF 3 | PERMIT # # | FILE # #

USER NAME: SPENCER SLACK
FILE NAME: R:\Projects\UPHS\UPHS1504-145 King of Prussia Road\DESIGN_PUBLISH\TRAFFIC SIGNAL\UPHS1504-SG-Plans.dwg
DATE SAVED: 4/10/2018 @ 12:01:05 PM DATE PLOTTED: 4/10/2018 @ 12:08:12 PM

MOVEMENT, SEQUENCE AND TIMING DIAGRAM



PHASE	1+5				1+6				2+5				2+6				4+8				EMERGENCY FLASHING
INTERVAL / SIGNALS	1	2	3		4	5	6		7	8	9		10	11	12	13	14	15	16	17	
1	R/~~G~~	R/~~A~~ ①	R ①		R	R	R		G/~~G~~	Y/~~A~~ ④	R ③		G	G	Y	R	R	R	R	R	Y
2	R	R	R		R	R	R		G	Y ③	R ③		G	G	Y	R	R	R	R	R	Y
3	~~G~~	~~Y~~ ②	~~R~~ ②		~~G~~	~~Y~~	~~R~~		~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
4,5,6	R	R	R		G	Y ③	R ③		R	R	R		G	G	Y	R	R	R	R	R	Y
7,8,9	R	R	R		R	R	R		R	R	R		R	R	R	R	G	G	Y	R	R
10,11	R	R	R		R	R	R		R	R	R		R	R	R	R	G	G	Y	R	R
12,13,14,15	H	H	H		H	H	H		H	H	H		M	FH	H	H	H	H	H	H	OFF
16,17,18,19	H	H	H		H	H	H		H	H	H		H	H	H	H	M	FH	FH	H	OFF

FIXED		4	2			4	2			4	2				4	2			4	2
MINIMUM	3				3				3				28				7			
PASSAGE	3				3				3				**				3			
MAXIMUM I	5				5				5				47				20			
MAXIMUM II	5				5				5				47				20			
PEDESTRIAN*													7	21			5	16		
MEMORY	NL				NL				NL				MX				NL			

* UPON PEDESTRIAN ACTUATION ONLY, OTHERWISE HAND SYMBOL AT ALL TIMES
NOTE: REFER TO SYSTEM PERMIT # I-0010 FOR PROGRAM TIMING & WEEKLY PROGRAM CHART

- SIGNAL TO DWELL IN 2+6 UNTIL ACTUATED BY 4+8 OR 1+5

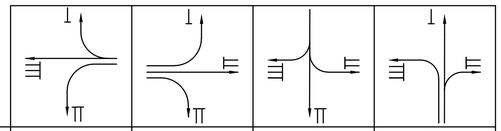
OPERATIONAL NOTES

① R/~~G~~ IF FOLLOWED BY PHASE 2+5
② ~~G~~ IF FOLLOWED BY PHASE 1+6
③ G IF FOLLOWED BY PHASE 2+6
④ G/~~A~~ IF FOLLOWED BY PHASE 2+6

** DENSITY ZONE NOTES
- RANGE OF DETECTION: 0-100 FEET FROM STOP BAR
- SPEED BOUNDARY: 5-30 MPH

** ADVANCED DILEMMA ZONE NOTES
- ESTIMATED TIME OF ARRIVAL: MIN 2.5-MAX 5.5 SEC.
- RANGE OF DETECTION: 0-450 FEET
- SPEED BOUNDARY: 27-100 MPH

EMERGENCY PRE-EMPTION PHASING
MOVEMENT, SEQUENCE AND TIMING DIAGRAM



PHASE	2				6				4				8			
INTERVAL / SIGNALS	18	19	20		21	22	23		24	25	26		27	28	29	
1	R	R	R		G/~~G~~	Y/~~A~~ ③	R ②		R	R	R		R	R	R	
2	R	R	R		G	Y ②	R ②		R	R	R		R	R	R	
3	~~G~~	~~Y~~	~~R~~		~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	
4,5,6	G	Y ②	R ②		R	R	R		R	R	R		R	R	R	
7,8,9	R	R	R		R	R	R		G	Y	R		R	R	R	
10,11	R	R	R		R	R	R		R	R	R		G	Y	R	
12,13,14,15	H	H	H		H	H	H		H	H	H		H	H	H	
16,17,18,19	H	H	H		H	H	H		H	H	H		H	H	H	
FIXED	①	4	2		①	4	2		①	4	2		①	4	2	

① FOR DURATION OF PREEMPTION
② TO REMAIN G WHEN RETURNING TO NORMAL OPERATION
③ TO INDICATE G/~~A~~ WHEN RETURNING TO NORMAL OPERATION

EMERGENCY PRE-EMPTION NOTES:

CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE NORTHBOUND AND SOUTHBOUND APPROACHES OF KING OF PRUSSIA ROAD, THE EASTBOUND APPROACH OF RAIDER ROAD, AND THE WESTBOUND APPROACHES OF THE PRIVATE DRIVEWAY WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION. THIS FAIL SAFE DEVICE SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT, AND SHALL BEGIN FLASHING WHEN THE PREEMPTION PHASE DISPLAYS PREEMPTION GREEN FOR THE EMERGENCY VEHICLE APPROACH.

THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS, EXCEPT THE GREEN INDICATIONS FOR THE PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE, FOLLOWED BY COMPLETE YELLOW AND RED CLEARANCE INTERVALS, ACCORDINGLY. THEN THE "GREEN" INTERVAL FOR THE PREEMPTED PHASE SHALL FOLLOW ONLY THOSE PHASES NOT POSING A YELLOW TRAP CONDITION MAY REMAIN GREEN (1+6, 2+5) WHEN GOVERNED BY APPROACHING EMERGENCY VEHICLE.

IF THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ARE FLASHING ALL SIGNALS SHALL REMAIN FLASHING.

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 PUSHBUTTON, AND THE SIGNAL IS PRE-EMPTED DURING THE "MAN" INTERVAL, THE MAN INTERVAL SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE "FLASHING HAND" INDICATION IN ITS ENTIRETY. THIS INTERVAL SHALL TIME OUT FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES BEFORE GOING INTO EMERGENCY PRE-EMPTION.

UPON COMPLETION OF PRE-EMPTION PHASE 2, 4, 6 OR 8 IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 10 SHALL FOLLOW.

IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED. PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.

IF PREEMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR THE IDENTIFICATION OF VEHICLES, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON, TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PREEMPTION.

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.

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 MEASUREDAT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

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

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT 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.

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

SYSTEM PERMIT # I-0010

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: DELAWARE
MUNICIPALITY: RADNOR TOWNSHIP
INTERSECTION: KING OF PRUSSIA ROAD AND RAIDER ROAD

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

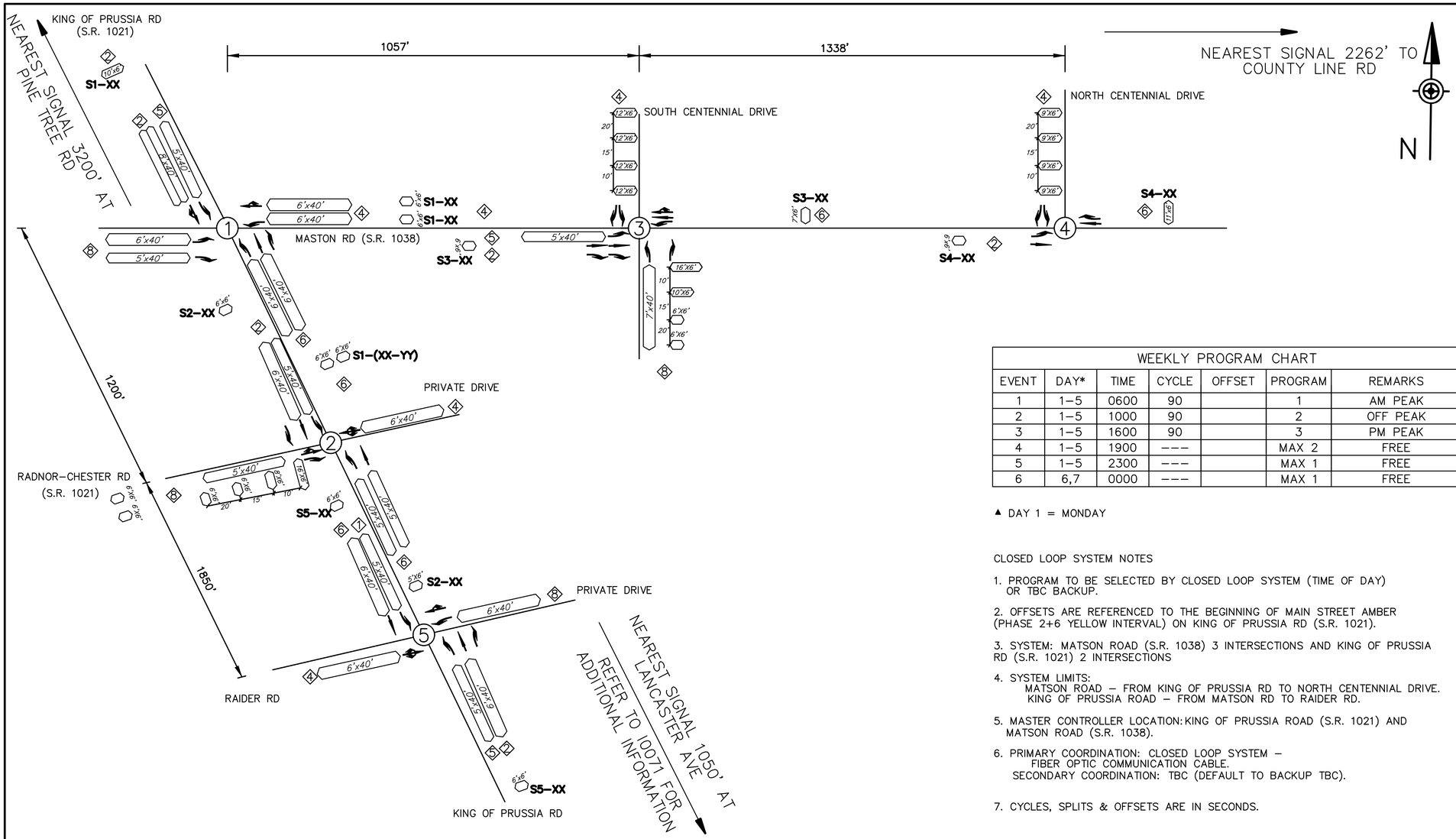
RECOMMENDED:

DATE

DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE
1							
2							
3							
4							
5							
6							
7							
8							

SHEET 3 OF 3 | PERMIT # # | FILE # #



WEEKLY PROGRAM CHART						
EVENT	DAY*	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–5	0600	90		1	AM PEAK
2	1–5	1000	90		2	OFF PEAK
3	1–5	1600	90		3	PM PEAK
4	1–5	1900	---		MAX 2	FREE
5	1–5	2300	---		MAX 1	FREE
6	6,7	0000	---		MAX 1	FREE

▲ DAY 1 = MONDAY

CLOSED LOOP SYSTEM NOTES

1. PROGRAM TO BE SELECTED BY CLOSED LOOP SYSTEM (TIME OF DAY) OR TBC BACKUP.

2. OFFSETS ARE REFERENCED TO THE BEGINNING OF MAIN STREET AMBER (PHASE 2+6 YELLOW INTERVAL) ON KING OF PRUSSIA RD (S.R. 1021).

3. SYSTEM: MATSON ROAD (S.R. 1038) 3 INTERSECTIONS AND KING OF PRUSSIA RD (S.R. 1021) 2 INTERSECTIONS

4. SYSTEM LIMITS:
   MATSON ROAD – FROM KING OF PRUSSIA RD TO NORTH CENTENNIAL DRIVE.
   KING OF PRUSSIA ROAD – FROM MATSON RD TO RAIDER RD.

5. MASTER CONTROLLER LOCATION: KING OF PRUSSIA ROAD (S.R. 1021) AND MATSON ROAD (S.R. 1038).

6. PRIMARY COORDINATION: CLOSED LOOP SYSTEM – FIBER OPTIC COMMUNICATION CABLE.
   SECONDARY COORDINATION: TBC (DEFAULT TO BACKUP TBC).

7. CYCLES, SPLITS & OFFSETS ARE IN SECONDS.

SYSTEM SETBACK DETECTORS LOCATED 300' FROM STOP BAR

FILE #		Program 1= Intersections	1	2	3	Phase 4	5	6	7	8	PED	Cycle	Offsets Bal	Offsets DR2(WB)	DR1(EB)
0890	1	King of Prussia Rd		62		28	22(LEAD)	40		28		90	XX		
1800	2	Radnor Chester Rd		50		40		50		40		90	74		
2395	3	South Centennial Drive		XX		XX	XX(LEAD)	XX		XX		90	XX		
3194	4	North Centennial Drive		71		13		71				90	12		
XXXX	5	Raider Rd	11(LEAD)	52		27	11(LEAD)	52		27		90	23		

FILE #		Program 2 = Intersections	1	2	3	Phase 4	5	6	7	8		Cycle	Offset # 1 Bal	Offset # 2 DR2(WB)	Offset # 3 DR1(EB)
	1	King of Prussia Rd		XX		XX	XX(LEAD)	XX		XX		90	XX		
	2	Radnor Chester Rd		39		51		39		51		90	88		
	3	South Centennial Drive		XX		XX	XX(LEAD)	XX		XX		90	XX		
	4	North Centennial Drive		53		31		53				90	36		
XXXX	5	Raider Rd	11(LEAD)	52		27	11(LEAD)	52		27		90	XX		
	6														
	7														
	8														

FILE #		Program 3 = Intersections	1	2	3	Phase 4	5	6	7	8		Cycle	Offset # 1 Bal	Offset # 2 DR2(WB)	Offset # 3 DR1(EB)
	1	King of Prussia Rd		50		40	13(LEAD)	37		40		90	44		
	2	Radnor Chester Rd		55		35		55		35		90	20		
	3	South Centennial Drive		XX		XX	XX(LEAD)	XX		XX		90	XX		
	4	North Centennial Drive		61		29		61				90	46		
XXXX	5	Raider Rd	11(LEAD)	52		27	8(LEAD)	52		27		90	76		
	6														
	7														
	8														

Notes:
– ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.
– REFER TO SIGNAL PERMIT PLAN FOR MAX 1, MAX 2 AND CLEARANCE AND PED TIMES.

LEGEND

- ④ INTERSECTION ADDRESS
- S## SYSTEM LOOP/ IDENTIFYING NUMBER
- LOOP SENSOR
- DETECTION ZONE
- ④ PHASE NUMBER

NOT TO SCALE

GENERAL NOTES

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

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

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

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

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

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

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

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

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 OF THE LATEST AMENDMENT TO 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.

INTERCONNECT PERMIT # 0010

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: DELAWARE
MUNICIPALITY: RADNOR TOWNSHIP
INTERSECTION: CLOSED SYSTEM FOR SR 1038 & SR 1021
MATSON FORD ROAD (S.R. 1038)
KING OF PRUSSIA RD (S.R. 1021)

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

DISTRICT TRAFFIC ENGINEER DATE

NO	REVISION	DES/ REVW	DATE	REVW	DATE	RECOM	DATE
1	REVISED PAVEMENT MARKINGS	TPD	6/15/01	TPO	6/15/01	WJE	6/19/01
2	ADDITION OF SIGNAL AT RAIDER ROAD	PAI	4/5/18				
3							
4							
5							
6							
7							
8							

INTERCONNECT PERMIT # 0010 | SHEET 2 OF 3

$DATE$ $TIME$
FILENAME= $FILE$

Appendix H

Auxiliary Turn Lane Analysis

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	AM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	96	0.0%	96
	Through	-	692	4.0%	706
	Right	Yes	14	9.0%	15
Opposing	Left	Yes	3	0.0%	3
	Through	-	539	4.0%	550
	Right	Yes	141	0.0%	141

Advancing Volume:	817
Opposing Volume:	694
Left Turn Volume:	96
% Left Turns in Advancing Volume:	11.75%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	3	0.0%	N/A
	Through	-	539	4.0%	N/A
	Right	-	141	0.0%	N/A

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

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	96
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	**100**	**Feet**
Condition B:	**N/A**	**Feet**
Condition C:	**N/A**	**Feet**
Required Left Turn Lane Storage Length:	**100**	**Feet**

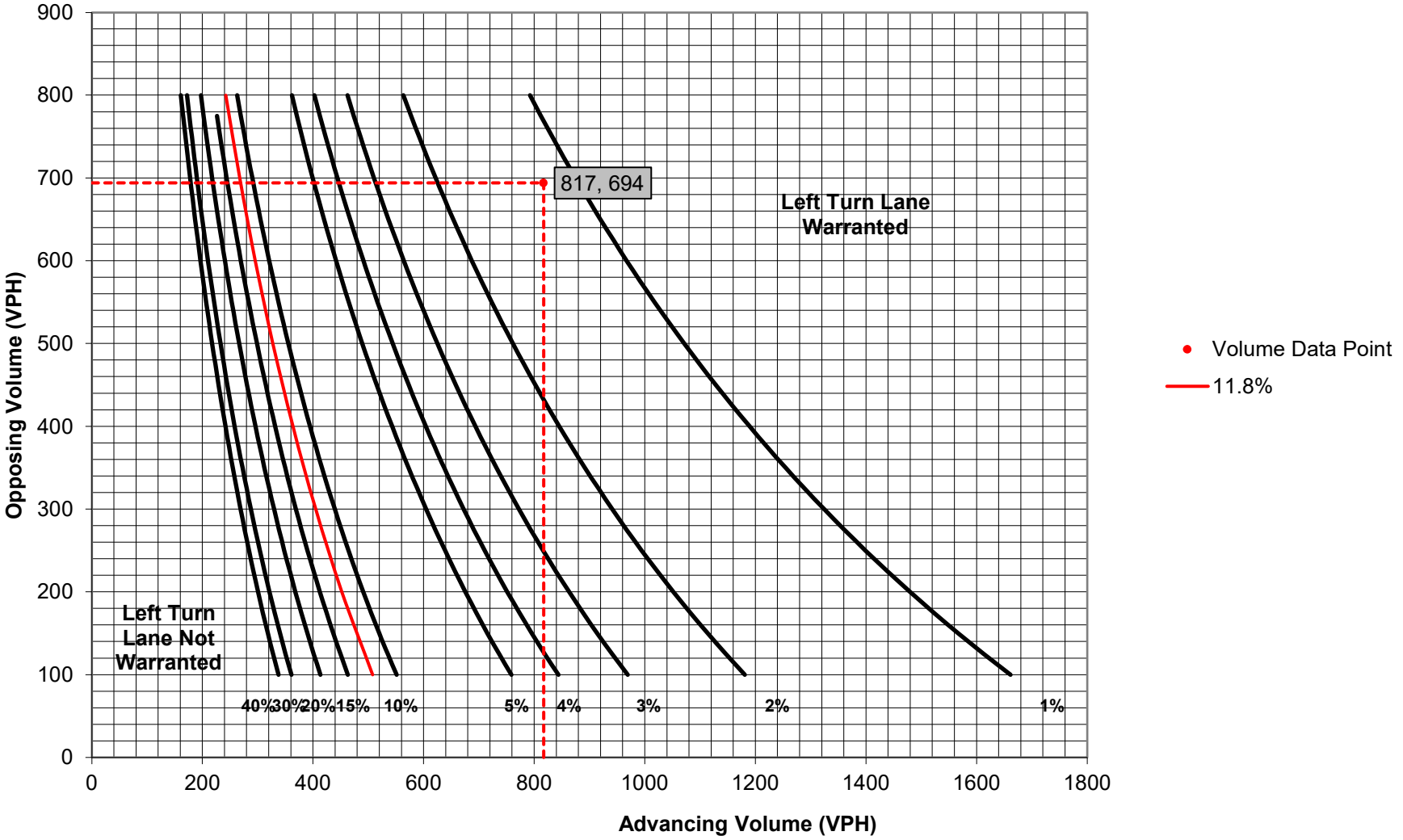
Additional Findings:

N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways (speeds to 35 mph, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	PM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	35	0.0%	35
	Through	-	796	1.0%	800
	Right	Yes	10	0.0%	10
Opposing	Left	Yes	1	0.0%	1
	Through	-	507	8.0%	528
	Right	Yes	59	25.0%	67

Advancing Volume:	845
Opposing Volume:	596
Left Turn Volume:	35
% Left Turns in Advancing Volume:	4.14%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	1	0.0%	N/A
	Through	-	507	8.0%	N/A
	Right	-	59	25.0%	N/A

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

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	35
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 1.0

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

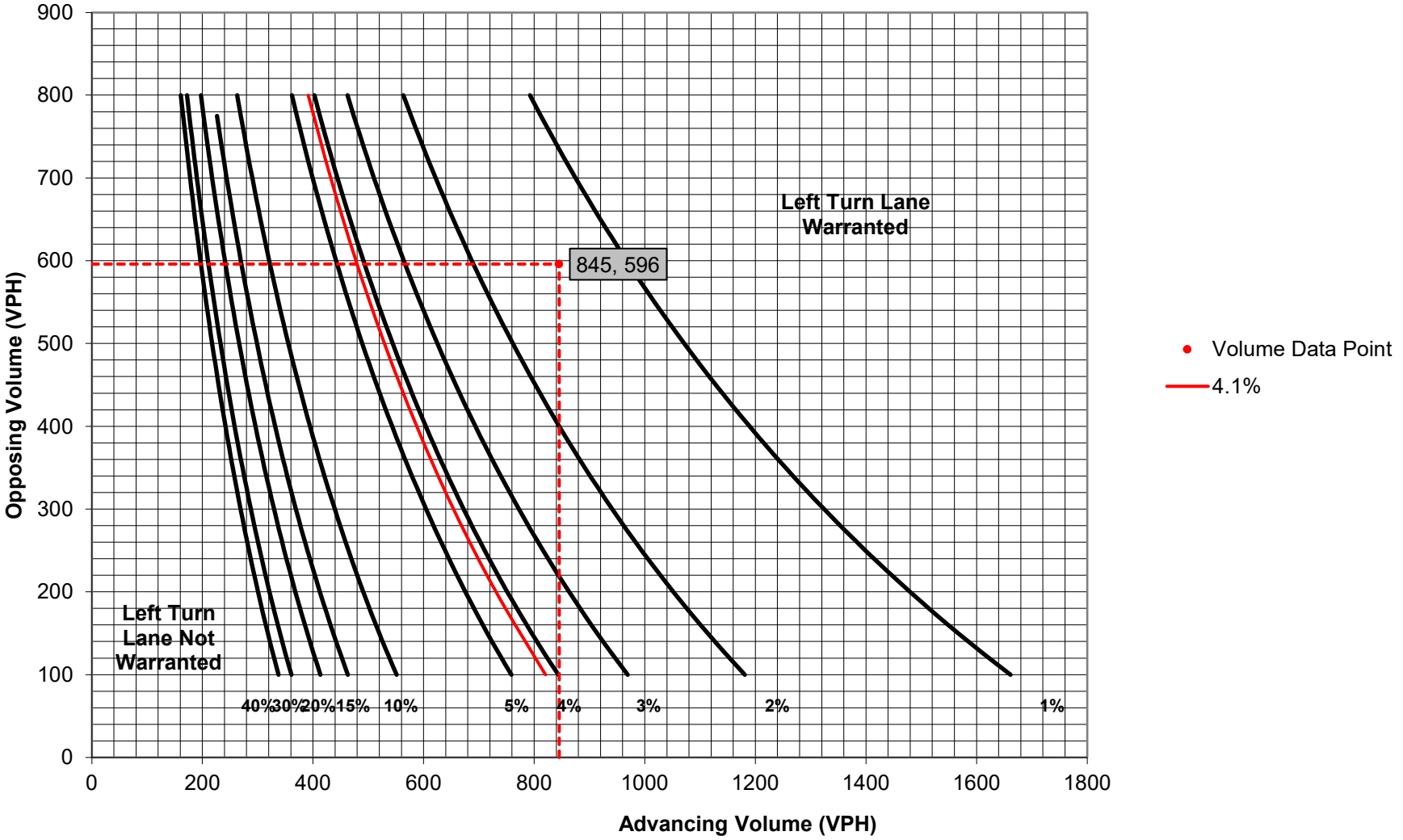
Additional Findings:

N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways (speeds to 35 mph, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	AM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	96	0.0%	N/A
	Through	-	692	4.0%	N/A
	Right	Yes	14	9.0%	N/A
Opposing	Left	Yes	3	0.0%	N/A
	Through	-	539	4.0%	N/A
	Right	Yes	141	0.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	3	0.0%	3
	Through	-	539	4.0%	550
	Right	-	141	0.0%	141

Advancing Volume:	694
Right Turn Volume:	141

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: N/A

Warrant Met?: N/A

Right Turn Lane Warrant Findings

Applicable Warrant Figure: Figure 9

Warrant Met?: Yes

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	141
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

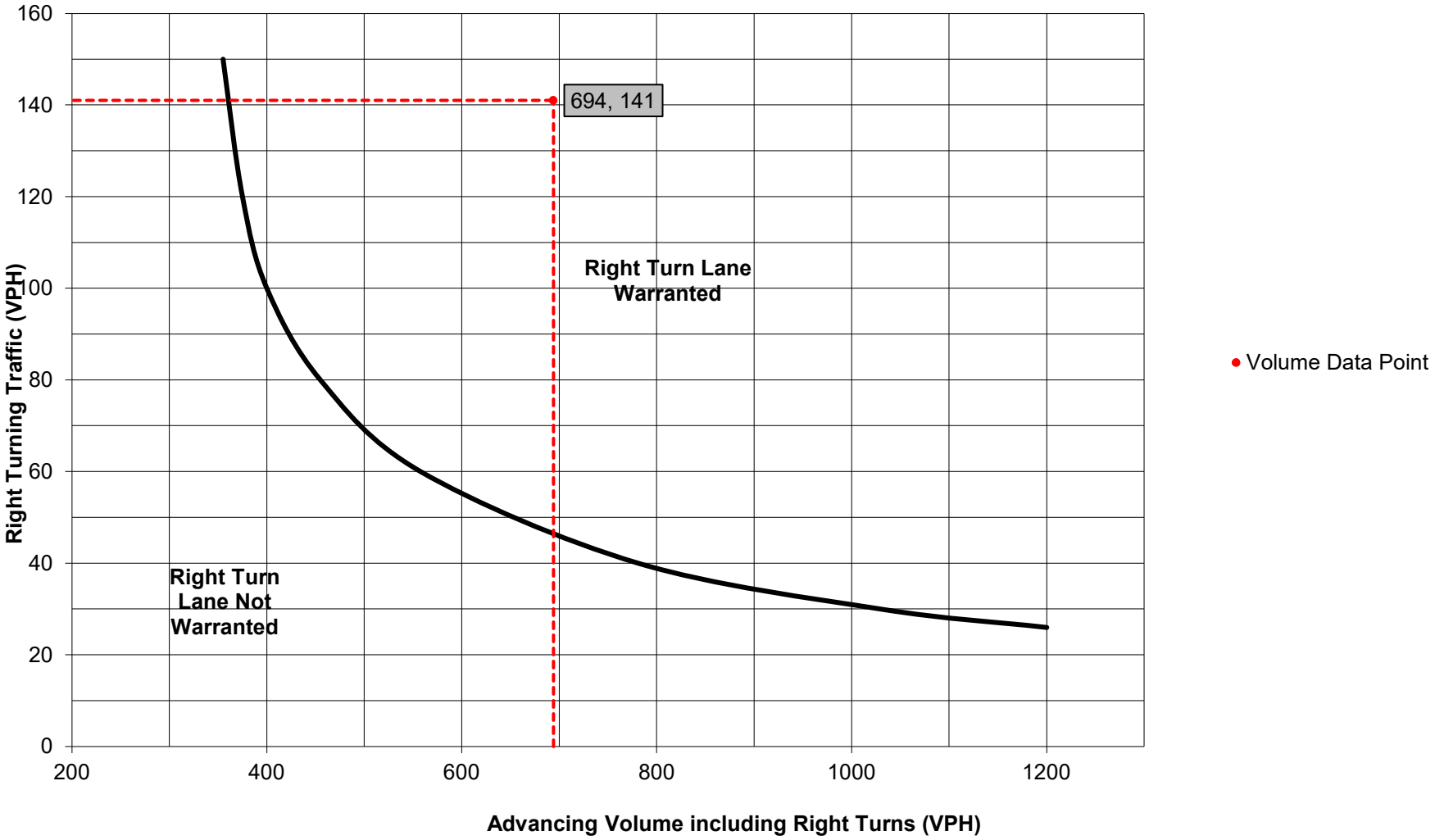
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	100	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	100	Feet

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: King of Prussia Road & 250 Office Loop Road/201 King of Prussia Driveway

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	PM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	35	0.0%	N/A
	Through	-	796	1.0%	N/A
	Right	Yes	10	0.0%	N/A
Opposing	Left	Yes	1	0.0%	N/A
	Through	-	507	8.0%	N/A
	Right	Yes	59	25.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	1	0.0%	1
	Through	-	507	8.0%	528
	Right	-	59	25.0%	67

Advancing Volume:	596
Right Turn Volume:	67

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: N/A

Warrant Met?: N/A

Right Turn Lane Warrant Findings

Applicable Warrant Figure: Figure 9

Warrant Met?: Yes

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	67
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 1.0

PennDOT Publication 46, Exhibit 11-6

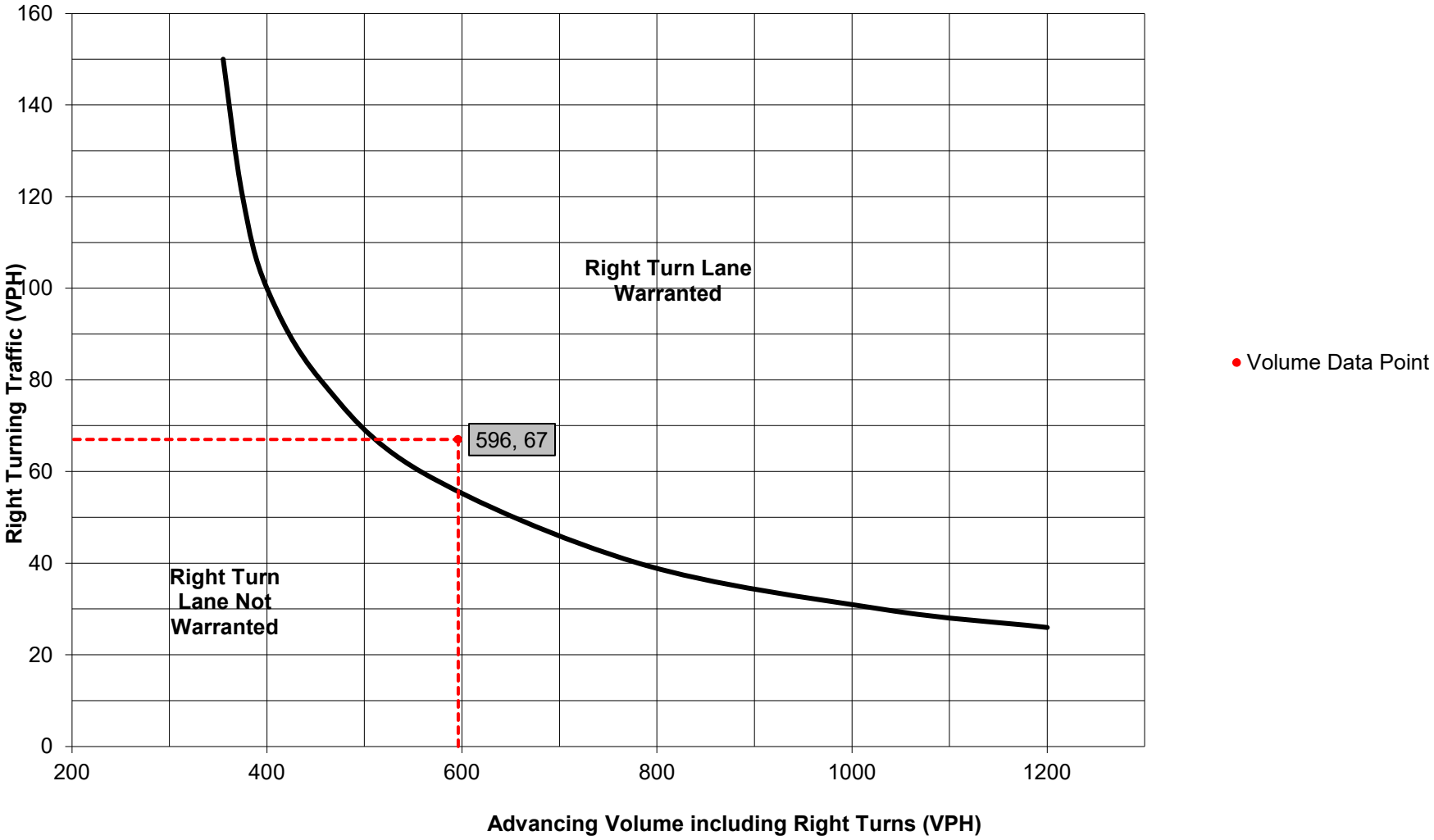
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Radnor Chester Road & 250 Office Loop Road

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	AM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	23	0.0%	23
	Through	-	418	4.0%	427
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	425	3.0%	432
	Right	Yes	76	0.0%	76

Advancing Volume:	450
Opposing Volume:	508
Left Turn Volume:	23
% Left Turns in Advancing Volume:	5.11%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	N/A
	Through	-	425	3.0%	N/A
	Right	-	76	0.0%	N/A

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

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: Figure 1

Warrant Met?: No

Right Turn Lane Warrant Findings

Applicable Warrant Figure: N/A

Warrant Met?: N/A

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	23
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

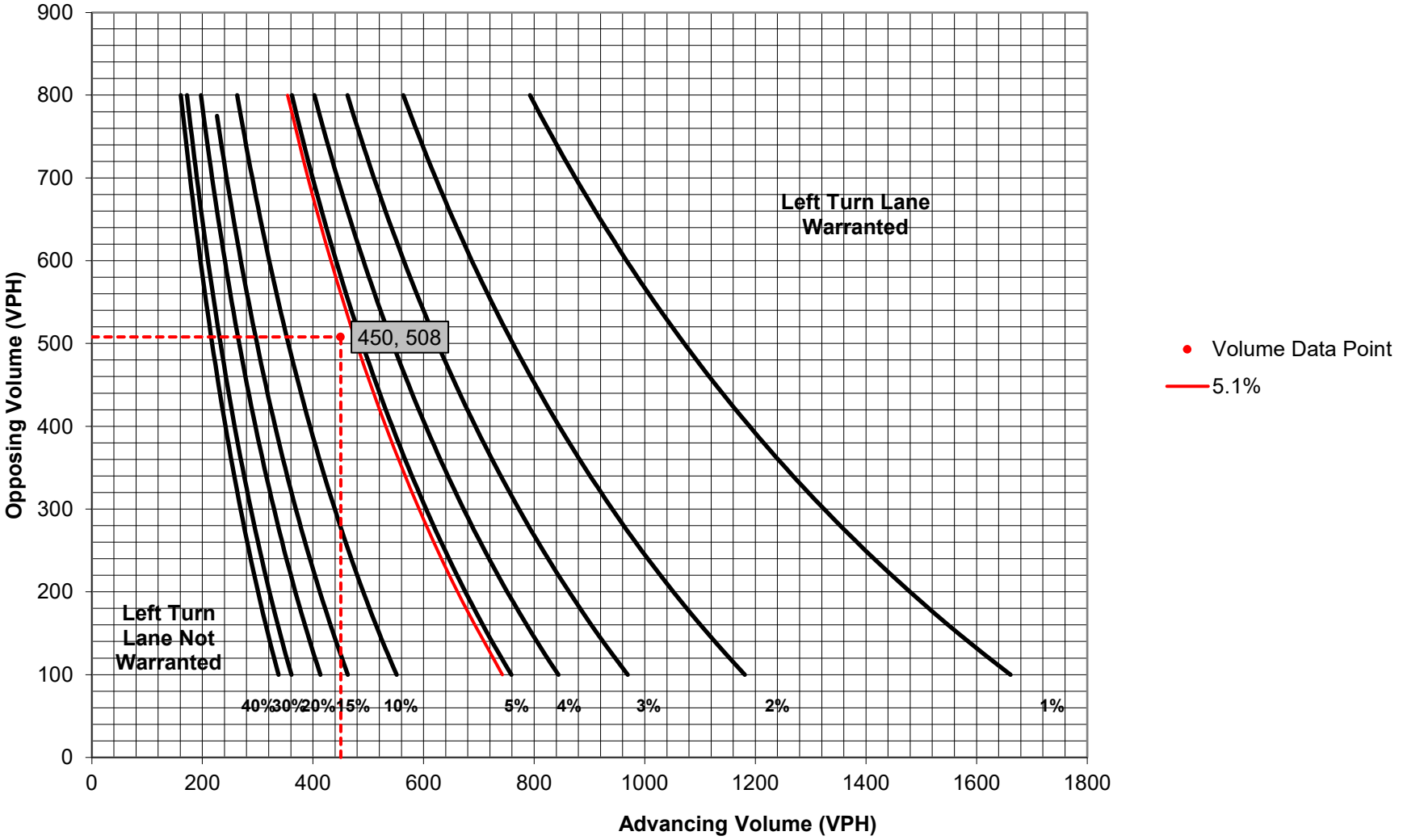
Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Left Turn Lane Storage Length:	N/A	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways (speeds to 35 mph, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Radnor Chester Road & 250 Office Loop Road

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	PM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	11	0.0%	11
	Through	-	605	1.0%	609
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	363	1.0%	365
	Right	Yes	29	20.0%	32

Advancing Volume:	620
Opposing Volume:	397
Left Turn Volume:	11
% Left Turns in Advancing Volume:	1.77%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	N/A
	Through	-	363	1.0%	N/A
	Right	-	29	20.0%	N/A

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

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: Figure 1

Warrant Met?: No

Right Turn Lane Warrant Findings

Applicable Warrant Figure: N/A

Warrant Met?: N/A

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	11
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

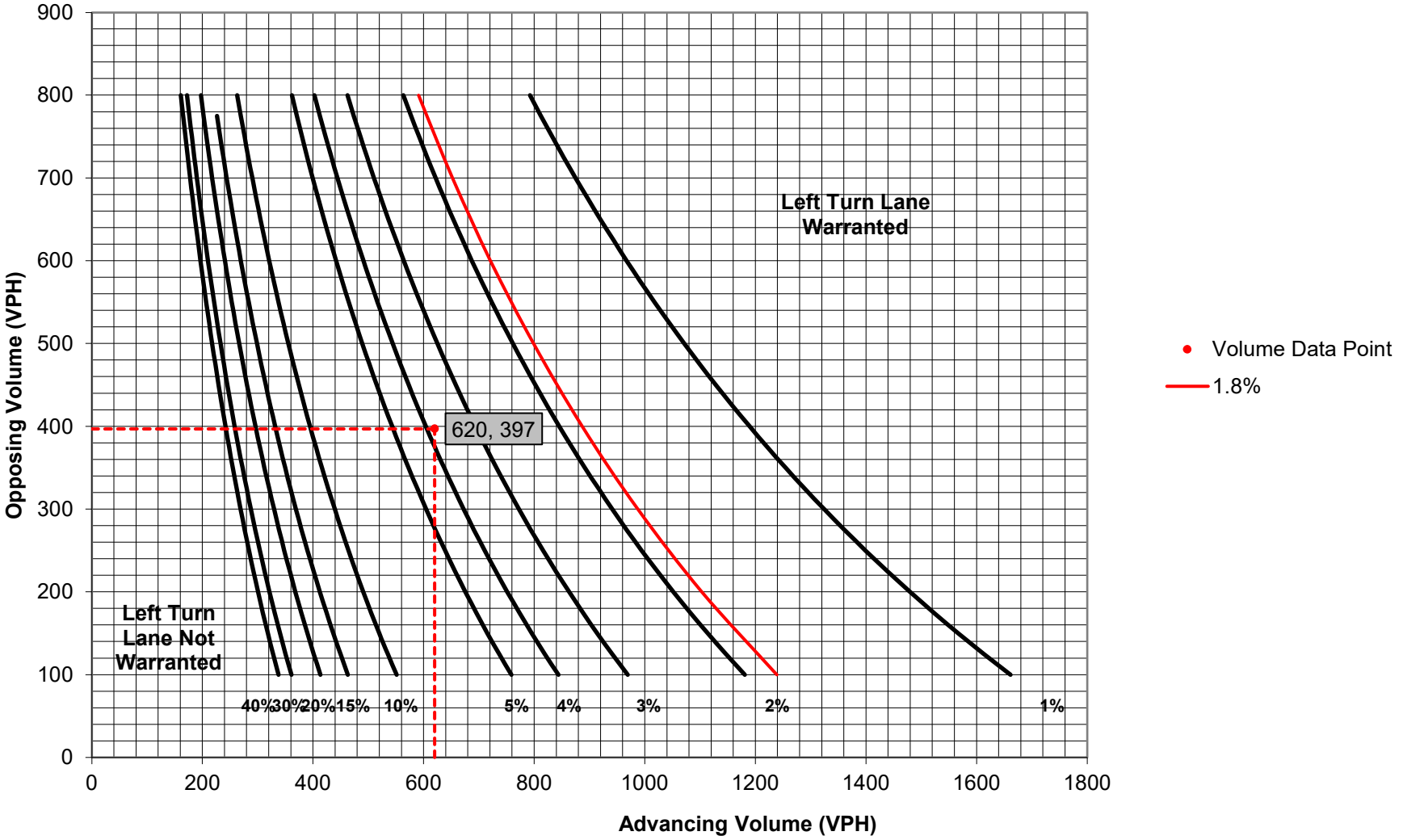
Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Left Turn Lane Storage Length:	N/A	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways (speeds to 35 mph, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Radnor Chester Road & 250 Office Loop Road

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	AM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	23	0.0%	N/A
	Through	-	418	4.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	425	3.0%	N/A
	Right	Yes	76	0.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	425	3.0%	432
	Right	-	76	0.0%	76

Advancing Volume:	508
Right Turn Volume:	76

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: N/A

Warrant Met?: N/A

Right Turn Lane Warrant Findings

Applicable Warrant Figure: Figure 9

Warrant Met?: Yes

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	76
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 1.0

PennDOT Publication 46, Exhibit 11-6

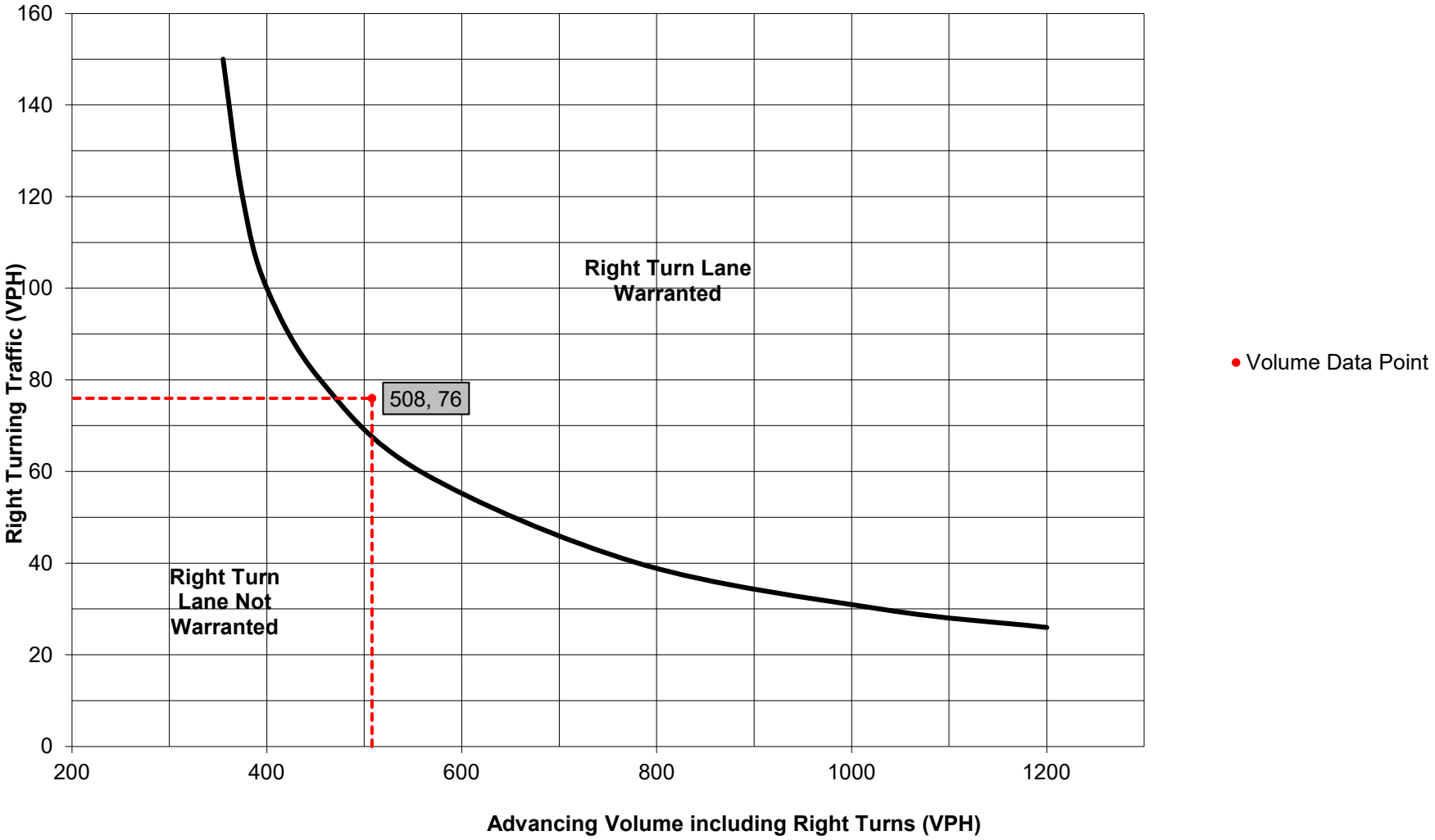
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Radnor Township	**Analysis Date:**	4/22/2021
County:	Delaware County	**Conducted By:**	EK
PennDOT Engineering District:	6	**Checked By:**	MH
		Agency/Company Name:	Traffic Planning and Design, Inc.

Intersection & Approach Description: Radnor Chester Road & 250 Office Loop Road

Analysis Period:	2023 Projected	**Number of Approach Lanes:**	1
Design Hour:	PM Peak Hour	**Undivided or Divided Highway:**	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		**Type of Analysis**
Type of Terrain:	Level	**Left or Right-Turn Lane Analysis?:**	Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	11	0.0%	N/A
	Through	-	605	1.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	363	1.0%	N/A
	Right	Yes	29	20.0%	N/A

Advancing Volume:	N/A
Opposing Volume:	N/A
Left Turn Volume:	N/A
% Left Turns in Advancing Volume:	N/A

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	363	1.0%	365
	Right	-	29	20.0%	32

Advancing Volume:	397
Right Turn Volume:	32

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: N/A

Warrant Met?: N/A

Right Turn Lane Warrant Findings

Applicable Warrant Figure: Figure 9

Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	32
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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