



248 Beech Hill Road • Wynnewood • PA • 19096 • (215) 625-3821 Phone • (484) 792-9495 Fax
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15 May 2023

Charlie Houser
Haverford Properties, Inc.
40 Morris Avenue, SU 150
Bryn Mawr, PA 19010

VIA EMAIL ONLY

**RE: Traffic Engineering Investigations of
Strafford Ave 38-unit Residential TH Site
Radnor Township, Delaware County, PA
FTA Job #219-011**

Dear Mr. Houser:

F. Tavani and Associates, Inc. (FTA) has conducted traffic engineering investigations for the above-referenced project in Strafford. This report has been prepared in accordance with Radnor code requirements and follows the recommended outline as identified in said ordinance.

GENERAL SITE DESCRIPTION

This study considers the traffic impact of a proposed townhouse community of 38 units. The housing is proposed to be for sale and will feature a mix of 3 and 4 bedrooms. The housing is proposed to be market-rate and not age-restricted. The process of entitlements, construction, and occupancy is expected to take 3-5 years. The site is immediately surrounded by other residential properties and the Eagle Village Shopping Center. Beyond them, there is a mix of office and retail buildings within a 1 mile radius of the site. Ample mass transit opportunities are also within a short distance of the site.

The site is located on the west side of Strafford Avenue, north of Eagle Road and is known as the Hamilton Estate. The site is presently developed with some existing housing, namely 6 total dwellings.

The site location and surrounding area are presented in figures which are attached to the end of this report, namely **Figure 1** and **Figure 2**. A reduced version of recent site plans for the project is featured in **Figure 3**. There are no other known approved land development projects in the vicinity of the site.

Note that technical appendices are provided following the figures. **Appendix A** includes project correspondence, including a recent Township Traffic Engineer (TTE) review memorandum. Photodocumentation of the study area / surrounding intersections is provided in **Appendix B**.

TRANSPORTATION FACILITIES DESCRIPTION

The site is surrounded on two sides by existing, two-way, one-lane-per-direction, public roadways, namely Strafford Avenue and Eagle Road. The roadways generally do not feature on-street public parking. Posted speed limit signs are present in the vicinity of the site along both Strafford Avenue and Eagle Road, where

the posted speed limit is 25 mph. There are limited sidewalk facilities in the study area. The major intersections closest to the site are all-way stop-controlled intersections with no painted crosswalks. There are existing SEPTA mass transit opportunities near the site including bus route 106 and a regional rail station (Strafford), each of which are within approximately one half mile of the site. No traffic signals (save for a flashing beacon at the all-way stop-controlled intersection of Strafford Avenue and Eagle Road) exist or are proposed in the immediate vicinity of the site. More site driveway and surrounding intersection details can be seen in a photodocumentation log provided in **Appendix B**.

The site has 38 units and is proposed to feature internal roadways, 2 site driveways (both on Strafford Avenue), garage/driveway parking, and visitor parking (approximately 14 defined spaces). Sidewalks are also proposed both within the site and along the site side of Strafford Avenue.

There are no known planned roadway improvements in the vicinity of the site. None of the streets surrounding the site are “SR”s (state roadways) – instead they are all local roadways. Eagle Road is a “G” roadway, meaning it is not an SR but is eligible for liquid fuels funding and PennDOT does maintain traffic count data along it, as seen in **Appendix C**.

EXISTING TRAFFIC CONDITIONS

FTA conducted traffic counts at the intersections of:

- Strafford Avenue and Eagle Road,
- Strafford Avenue and Grant Lane/Hedgerow Lane, and
- Eagle Road and N Wayne Avenue.

The counts were conducted on Thursday, 27 April 2023 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. The counts were conducted during the school year, in fair weather, and on a typical weekday. Existing peak hours of 8:00 AM to 9:00 AM and 4:45 PM to 5:45 PM were selected for study based on system-wide, individual peak hour investigations. The corresponding existing peak hour traffic volumes are plotted and seen in **Figure 4**. Raw traffic volumes are attached in **Appendix D**. Local school district calendar information is also contained in that appendix.

With existing peak hour volumes established, present-day “levels of service” can be assessed. Level of service (or LOS) is a descriptive mechanism which is employed by traffic engineers to relate quality of traffic flow to both a letter grade and estimate of delay in seconds per vehicle. LOS results are assessed for traffic which must stop or yield to other traffic. Free-flowing traffic theoretically has no delay, and therefore no LOS rating. Existing levels of service were determined using *Synchro version 11* software, with HCS 6th edition-format outputs selecting for performance reporting purposes. A **LOS Comparison Matrix** was prepared and is attached to the end of this report. The matrix summarizes AM and PM peak hour performance for existing and future (see next section) conditions for all intersections. As shown, existing levels of service are all LOS C or better, with all calculated delays being very low (9 seconds or less in most cases – an acceptable condition). No congestion locations (LOS E/F) are noted.

TRANSPORTATION IMPACT OF THE DEVELOPMENT

Site traffic was estimated using the Institute of Transportation Engineers (ITE) publication, Trip Generation, 11th edition. ITE website trip generation outputs for the best fit land used code matching the site (LUC 215) are attached and provided in **Appendix E**. Note that vehicular trip generation could have been modified to reflect how this site is located in a setting which is within walking distance of several businesses as well as

SEPTA bus route 106 plus the Strafford train station, though **no such multimodal credits were taken**. Instead, *all* site traffic was assigned (trip distributed) to the surrounding roadway network in accordance with existing traffic patterns as well as an understanding of existing road network connectivity, current traffic/congestion patterns, and relative locations of major highway interchanges (Interstates 476, 76, 202, and 422 as well as Business Route 30). The assignments are summarized as follows:

- 30% to/from Routes 202 & 422 via Strafford Ave to Old Eagle School Rd;
- 30% to/from Routes 476 & 76 via Eagle Rd to King of Prussia Rd;
- 15% to/from Business Rt 30 West via Eagle Rd and Strafford Ave;
- 15% to/from Business Rt 30 East via Eagle Rd and Strafford Ave, West Ave., and/or Banbury Way; &
- 10% to/from Conestoga Road via Eagle Road.

The trip distribution model for the community is shown in **Figure 5** and the resultant assignment of new, site-generated vehicular peak hour traffic is shown in **Figure 6**. A site trip generation summary table follows below. Note that no credit for the previously-mentioned 6 existing dwelling units was applied to the trip generation for the site, and instead the site was trip generated as a net increase of 38 townhomes.

**TABLE 1
 PROJECTED VEHICULAR TRIP GENERATION**

AM PEAK HOUR			PM PEAK HOUR		
<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
5	13	18	13	9	22

Average daily site traffic was also calculated and determined to be approximately 274 trips for the proposed community. Note that, per ITE, the site is eligible for walking / biking / transit credits of either 4 or 8 trips per peak hour, but – as already mentioned and to be conservative – these credits were not applied. See **Appendix E** for more details.

ANALYSIS OF TRANSPORTATION IMPACT

Future traffic conditions are a function of three components: (1) existing traffic volumes, (2) additional traffic due to general background growth as well as other known approved developments in the immediate proximity of the site, and (3) site traffic.

Regarding background growth, the currently promulgated background growth rate for Delaware County is 0.00% per year as reported by PennDOT (see **Appendix E** for more details). Regarding other developments, there is one other nearby known approved land development project in the vicinity of the site, namely the St. Honore single family detached residential development. Excerpts from a recent traffic study prepared for that development are provided in **Appendix E**. That project’s future full build site volumes (see **Figure 7**) amount to about 10 total, system-wide, peak hour trips and are incorporated in the future ‘no build’ traffic volumes for this effort. Since the difference between existing and future ‘no build’ traffic volumes is so slight, no level of service investigations were conducted for the ‘no build’ condition, though future ‘no build’ traffic volume plots are presented in **Figure 8**.

The projected future ‘build’ (no build plus site traffic as described in the previous sections) peak hour volumes are shown in **Figure 9**. The related projected levels of service are once shown in **LOS Comparison Matrix**. As shown projected ‘build’ levels of service once again remain essentially the same as they are today, and are all LOS C or better. The impact of site traffic is no added delay at nearly every

intersection turning movements and in the 3 instances where there is an impact, the forecasted increase in delay equals 1 second. Both site driveways are forecasted to operate at LOS A during both peak hours. Once again, no congestion locations (LOS E/F) are noted.

No road improvements are necessary to offset the impact of added site traffic. No proposed site driveway will feature traffic volumes which warrant the installation of a traffic signal. The acceptable operation of each site driveway in unsignalized state underscores this conclusion. Level of service worksheets are provided in **Appendix F**.

AUXILIARY LANE ANALYSIS

The need for new auxiliary left- and right-turn lanes at the site driveways was investigated. Investigations were based on PennDOT Strike Off Letter 560-08-4 as well as PennDOT *Publication 46* Chapter 11 page 11-46 (“Turn Lane Warrants”) using PennDOT-provided worksheets, and focusing on the highest peak hour. Investigations conclude that new auxiliary left- and right-turn lanes are not warranted at the site driveways. More details are provided in **Appendix G**.

ACCIDENT INVESTIGATIONS

Crash data were obtained from PennDOT for the study area intersections. PennDOT defines a reportable crash as follows, “A reportable (crash) is one in which an injury or fatality occurs or if at least one of the vehicles involved requires towing from the scene”. For a given intersection, PennDOT considers a crash occurrence of 5 reportable, correctable crashes over a continuous twelve-month period during the past five years to be a threshold value, above which the intersection design should be reviewed to examine if corrective measures can be taken to enhance safety.

Reportable crash data for the 6-year period between 1 January 2017 and 31 December 2022 was obtained from PennDOT. During this time frame, a total of 4 reportable crashes occurred at in study area which, as shown in **Appendix H**, is an approximate 500’ radius having a center along Strafford Avenue at the approximate midpoint of the site frontage there. The 4 reportable crashes included mostly angle incidents (75% of all crashes). There were no reported fatalities and no reported serious injuries. The crash frequency is less than 1 crash per year. **Tables 2** and **3** provide summaries of the crash frequencies and the type of crashes. More details are provided in **Appendix H**.

TABLE 2 – CRASH FREQUENCY BY INTERSECTION

Location	Frequency of Crashes (# per year)						Average Per Year
	2017	2018	2019	2020	2021	2022	
~500’ R of Site D’ways along Strafford Ave	2	1	1	0	0	0	0.67

TABLE 3 – CRASH TYPES

Location	Total 5-Year Occurrence & Type of Crash				
	Angle	Rear End	Head On	all others	Total
~500’ R of Site D’ways along Strafford Ave	3	0	1	0	4

CONCLUSIONS

As mentioned earlier, a **LOS Comparison Matrix** is provided to afford a simple means to review and assess site traffic impact in the study area. In locations where levels of service are not forecasted to change from one scenario to the next (i.e., from Existing to No Build, or from No Build to Build), hyphens are used. As shown, there are many instances in which the impact of site traffic results in essentially no measurable change in traffic performance and the underlying traffic performance is already acceptable, and with very low delays. Thus the traffic impact of the proposal on the surrounding community is negligible.

Other key conclusions are as follows:

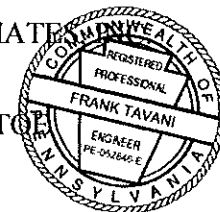
- The study area is presently well-served by transit opportunities;
- All intersections in the study area operate at LOS C or better under existing and future conditions;
- The crash history in the vicinity of the site is unremarkable;
- Both site driveways are forecasted to operate at LOS A during both peak hours, and for all turning movements;
- No site driveway requires new left-turn or right-turn auxiliary lanes per investigations using standard PennDOT tools;
- The foregoing conclusions were reached taking no credits for walking, biking, or transit even though ITE has identified credits for which this site is eligible;
- The foregoing conclusions were reached incorporating the effects of the full buildout of the nearby St. Honore site; and
- The foregoing conclusions were reached also taking no trip generation credits the existing 6 dwellings currently found on the site, even though such credit would have been appropriate.

I hope this has been helpful. Please let me know if I can answer any questions.

Thank you,

F. TAVANI AND ASSOCIATES


FRANK TAVANI, P.E., PTOE
Principal



attachments

cc: George Broseman, Esq.
Rob Lambert, P.E.

**LEVEL OF SERVICE AND EXPECTED DELAY
FOR UNSIGNALIZED INTERSECTIONS***

<u>LEVEL OF SERVICE</u>	<u>CONTROL DELAY PER VEHICLE (SECONDS)</u>
a	0 to 10.0
b	10.1 to 15.0
c	15.1 to 25.0
d	25.1 to 35.0
e	35.1 to 50.0
f	Over 50.0

* Transportation Research Board's Highway Capacity Manual

LEVEL OF SERVICE AND EXPECTED DELAY
FOR SIGNALIZED INTERSECTIONS*

<u>LEVEL OF SERVICE</u>	<u>DESCRIPTION</u>	<u>CONTROL DELAY PER VEHICLE (IN SECONDS)</u>
A	Very short delay, good progression; most vehicles do not stop at intersection.	≤ 10.0
B	Generally good signal progression and/or short cycle length; more vehicles stop at intersection than Level of Service A.	10.1 to 20.0
C	Fair progression and/or longer cycle length; significant number of vehicles stop at intersection.	20.1 to 35.0
D	Congestion becomes noticeable; individual cycle failures; longer delays from unfavorable progression, long cycle length, or high volume/capacity ratios; most vehicles stop at intersection.	35.1 to 55.0
E	Usually considered <u>limit of acceptable delay</u> indication of poor progression, long cycle length, or high volume/capacity ratio; frequent individual cycle failures.	55.1 to 80.0
F	Could be considered excessive delay in some areas, frequently an indication of saturation (i.e., arrival flow exceeds capacity), or very long cycle lengths with minimal side street "green" time. Capacity is not necessarily exceeded under this level of service.	> 80.0

* Transportation Research Board's Highway Capacity Manual

LEVEL OF SERVICE COMPARISON TABLES

1. Wayne Ave & Eagle Ave							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Strafford Ave		Existing (2023)	No Build (2028)	Build (2028)	Existing (2023)	No Build (2028)	Build (2028)
Eastbound	LTR	C 20	--	--	C 21	--	--
Westbound	LTR	C 20	--	--	C 20	--	--
Grant Ln / Hedgerow Ln							
Northbound	LTR	A 3	--	--	A 4	--	--
Southbound	LTR	A 4	--	--	A 4	--	--
OVERALL:		A 8	--	A 9	A 10	--	--

Control Type: Signal

2. Strafford Ave & Eagle Ave							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Eagle Ave		Existing (2023)	No Build (2028)	Build (2028)	Existing (2023)	No Build (2028)	Build (2028)
Eastbound	LTR	A 8	--	--	A 9	--	--
Westbound	LTR	A 9	--	--	A 9	--	--
Strafford Ave							
Northbound	LTR	A 8	--	--	A 9	--	--
Southbound	LTR	A 9	--	--	A 9	--	--
OVERALL:		A 8	--	A 9	A 9	--	--

Control Type: AWSC

3. Strafford Ave & Grant Ln / Hedgerow Ln							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Eagle Ave		Existing (2023)	No Build (2028)	Build (2028)	Existing (2023)	No Build (2028)	Build (2028)
Eastbound	LTR	A 8	--	--	A 8	--	--
Westbound	LTR	A 8	--	A 9	A 8	--	--
N Wayne Ave							
Northbound	LTR	A 7	--	--	A 8	--	--
Southbound	LTR	A 8	--	--	A 7	--	--
OVERALL:		A 8	--	--	A 8	--	--

Control Type: AWSC

4. Strafford Ave & W Site Drive								
Direction	Movement	AM Peak Hour			PM Peak Hour			
W Site Drive		Existing (2023)	No Build (2028)	Build (2028)	Existing (2023)	No Build (2028)	Build (2028)	
Northbound	LR			A 8			A 9	
Strafford Ave								
Westbound	L			A 9			A 9	
OVERALL:				A 1			A 1	

Control Type: TWSC

5. Strafford Ave & E Site Drive								
Direction	Movement	AM Peak Hour			PM Peak Hour			
E Site Drive		Existing (2023)	No Build (2028)	Build (2028)	Existing (2023)	No Build (2028)	Build (2028)	
Northbound	LR			A 8			A 9	
Strafford Ave								
Westbound	L			A 9			A 9	
OVERALL:				A 1			A 1	

Control Type: TWSC

-- indicates no change from the previous scenario

Future No Build volumes are virtually identical to Existing volumes so Future NB is represented to be the same as Existing; see report text for more information

All unsignalized 95th%ile queues are less than or equal to one car length (~25'); all signalized 95th%ile queues are less than 100 feet (see Appendix F for more info)

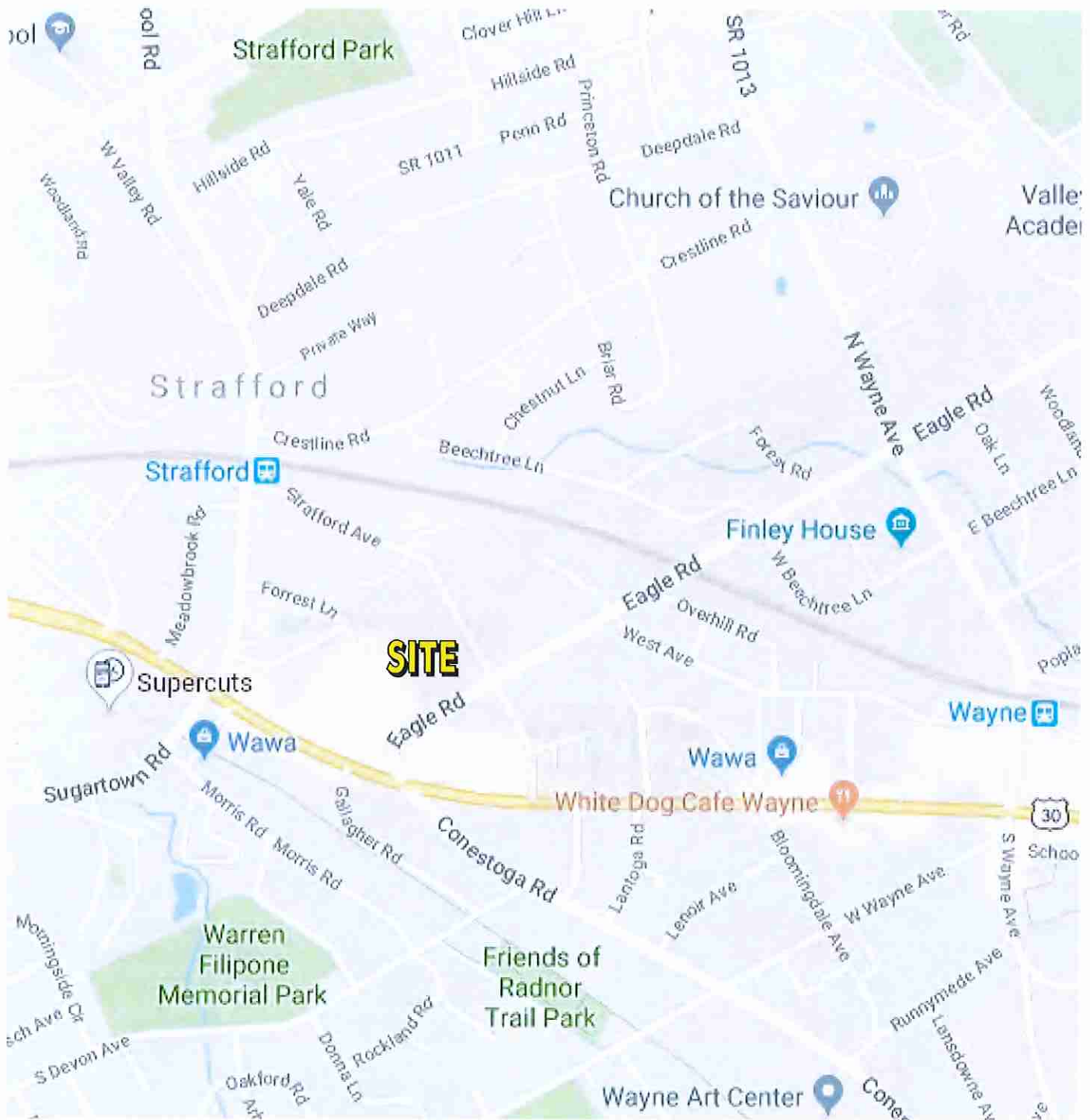


Site and Surrounding Area – Map View

Strafford Avenue Residential - 38 Townhouses
Radnor Township,
Delaware County, Pennsylvania



May 2023*



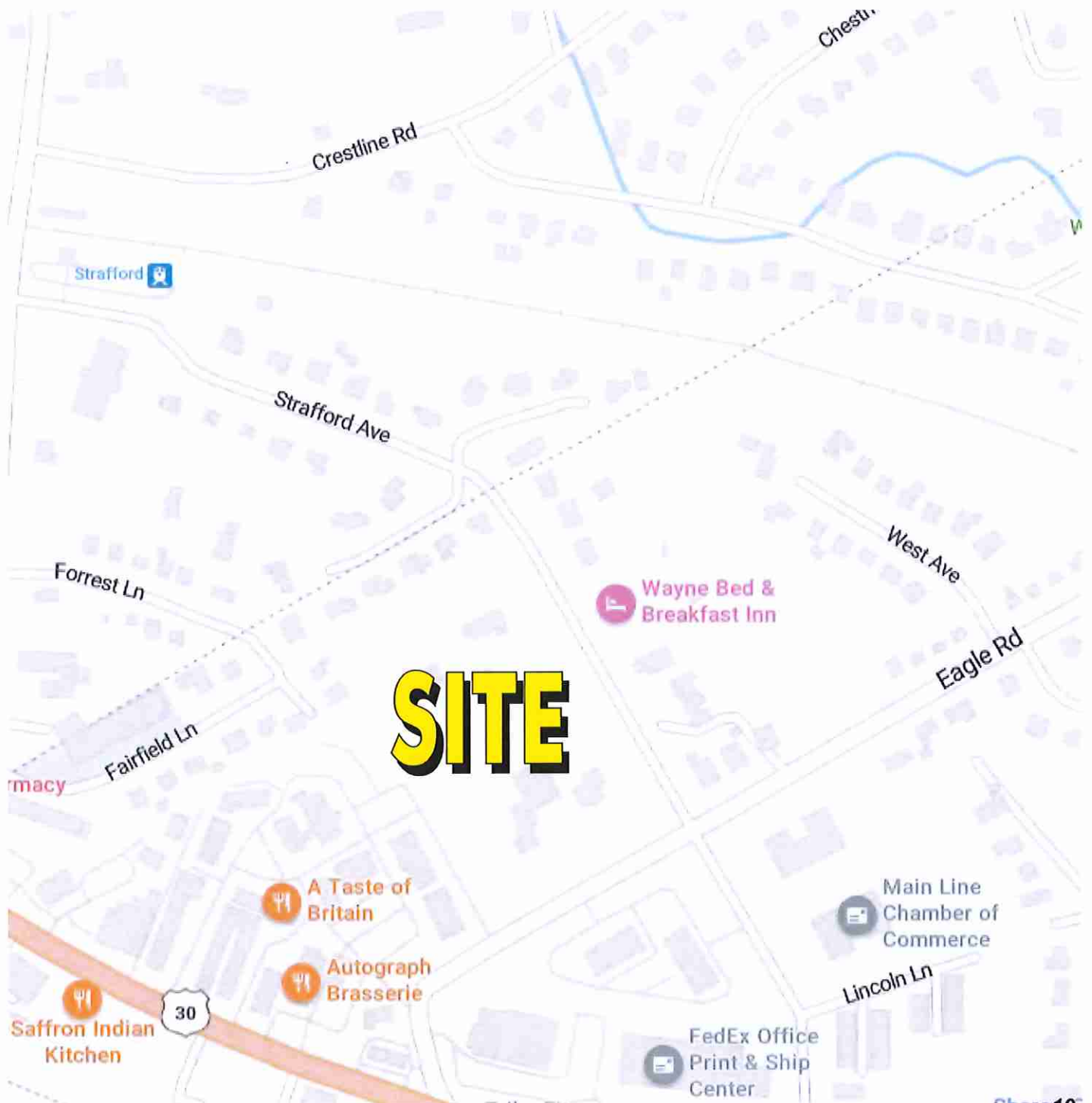
* Figure preparation date. See report for data collection date(s).



Site and Surrounding Area – Aerial View

Strafford Avenue Residential - 38 Townhouses
Radnor Township,
Delaware County, Pennsylvania

May 2023



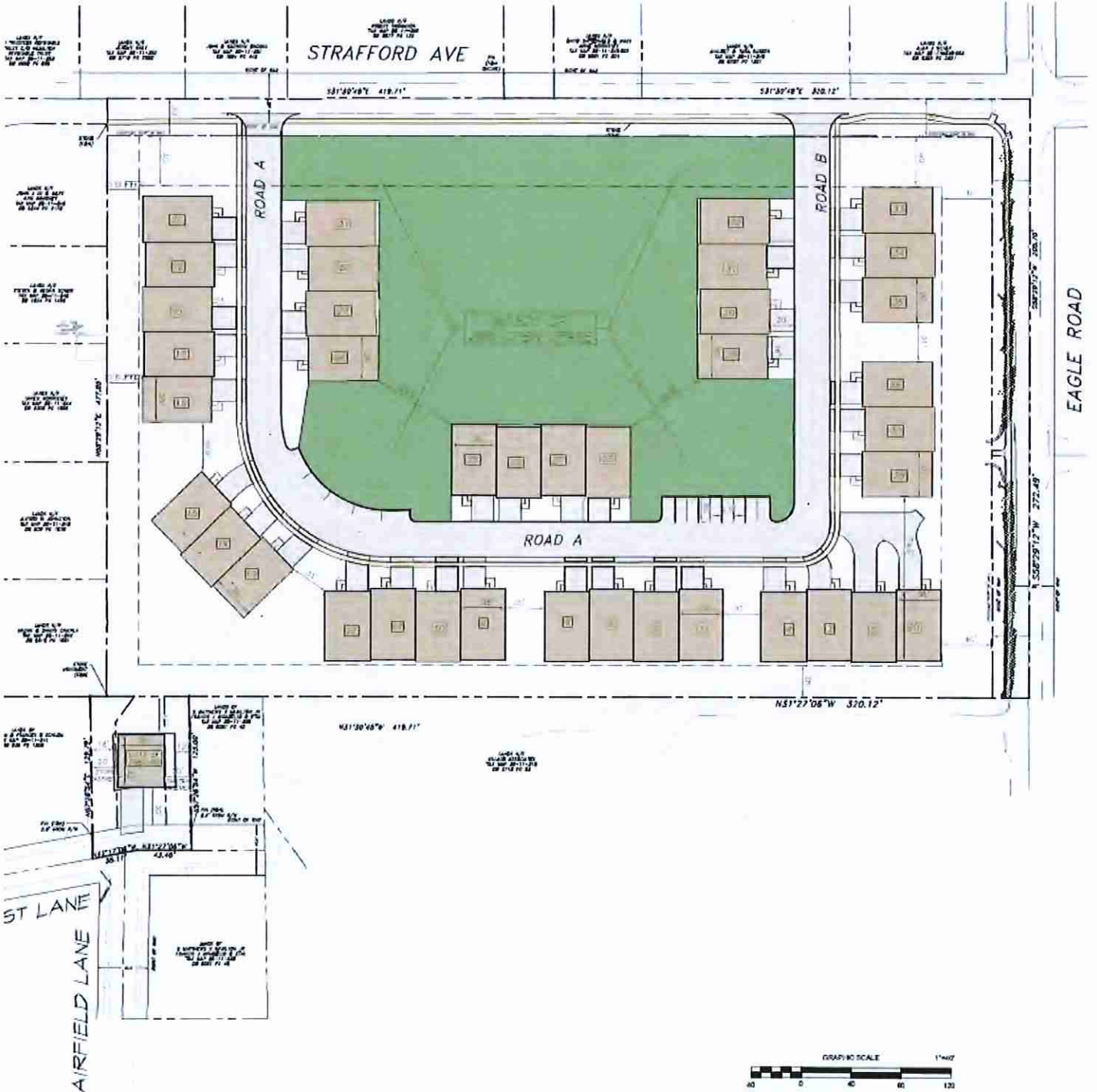


Site Plan Excerpt

Strafford Avenue Residential - 38 Townhouses Radnor Township, Delaware County, Pennsylvania



May 2023

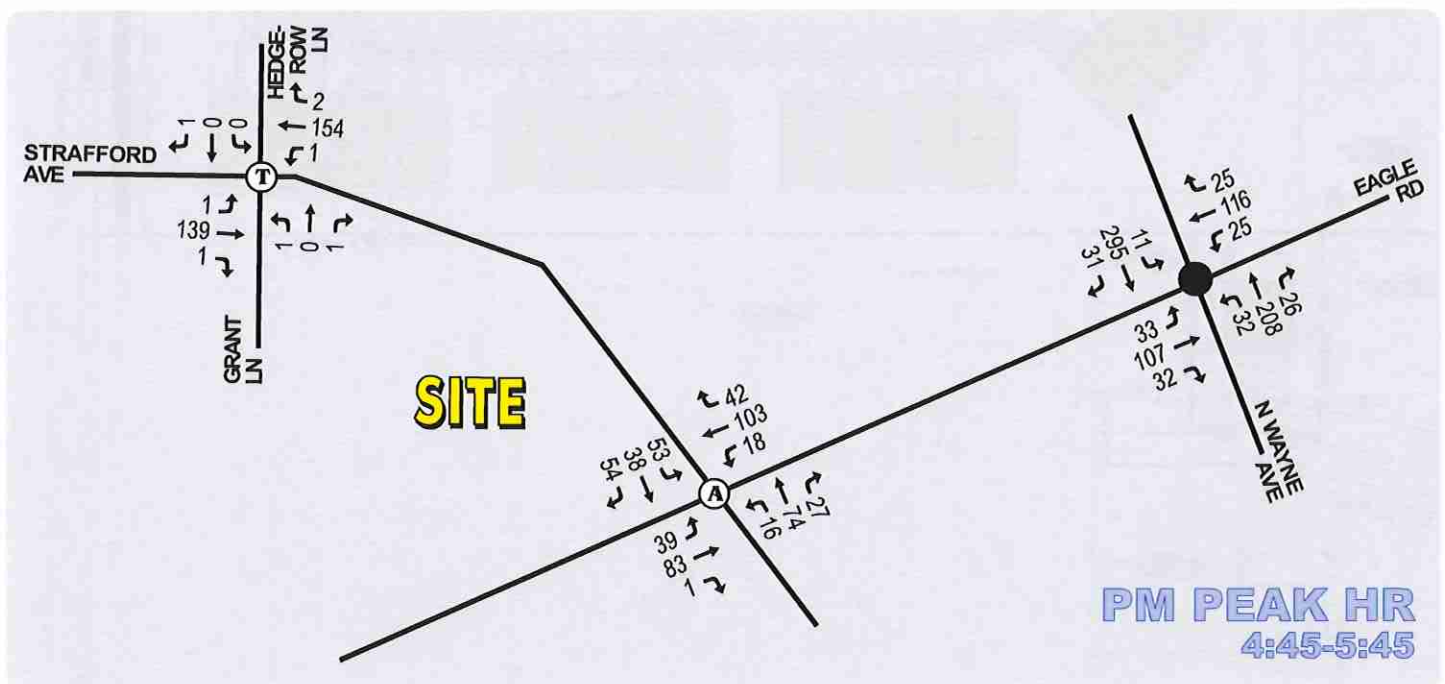
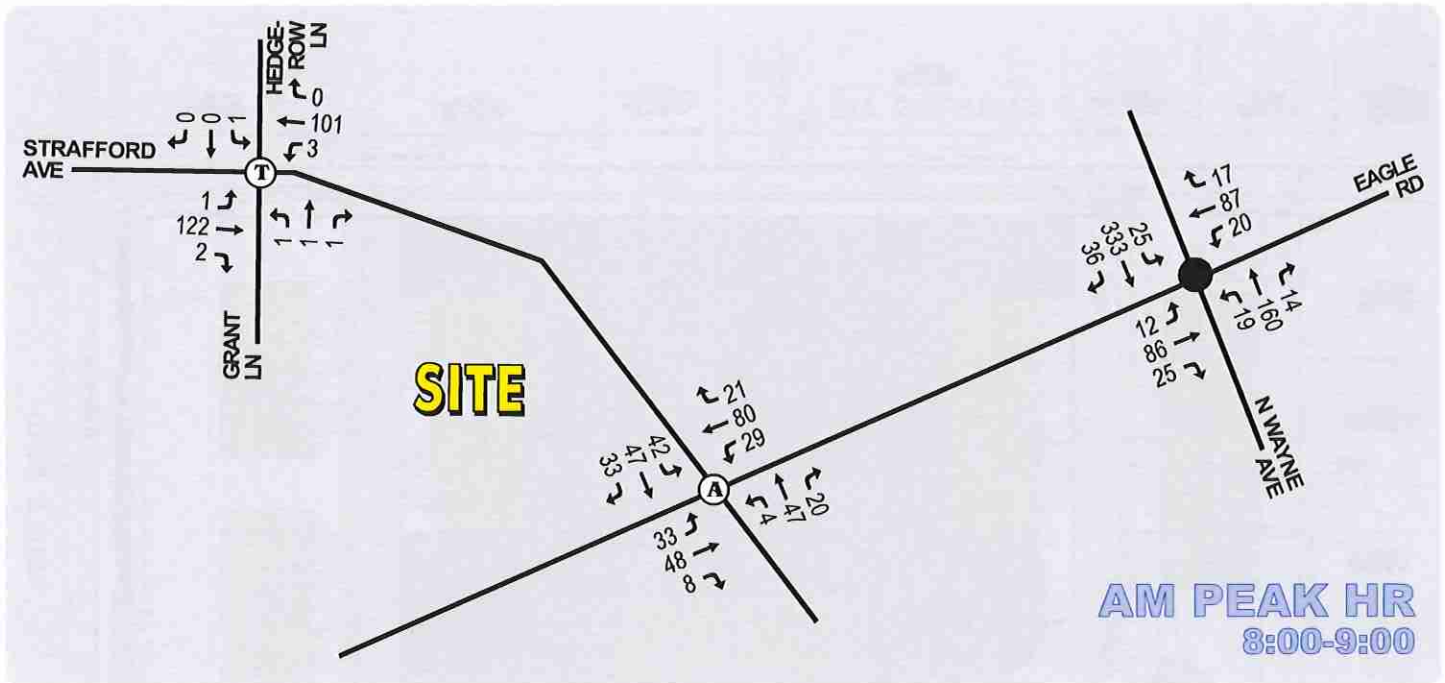


Existing (2023) Peak Hour Traffic Volumes

Strafford Avenue Residential - 38 Townhouses
Radnor Township,
Delaware County, Pennsylvania



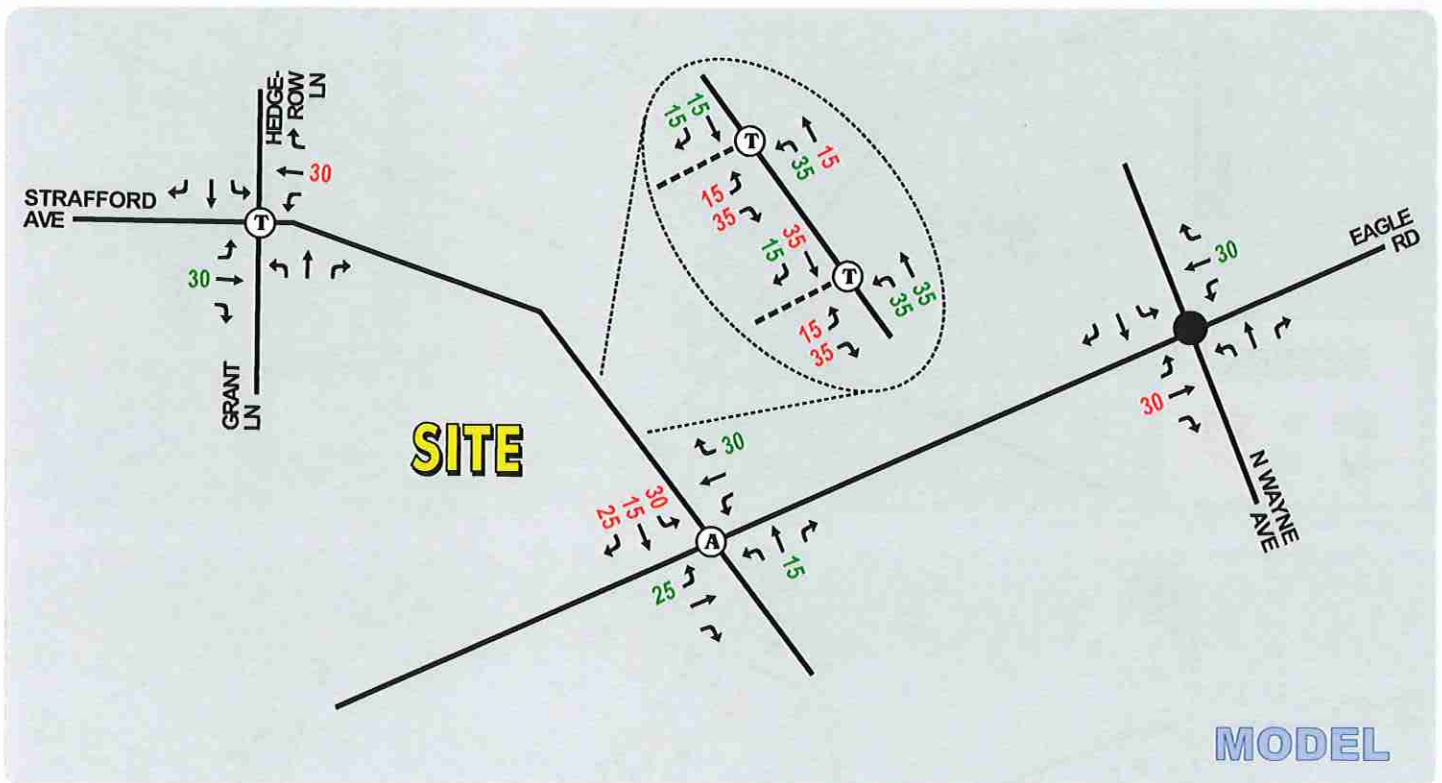
May 2023



Site Peak Hour Traffic – Model

Strafford Avenue Residential - 38 Townhouses
Radnor Township,
Delaware County, Pennsylvania

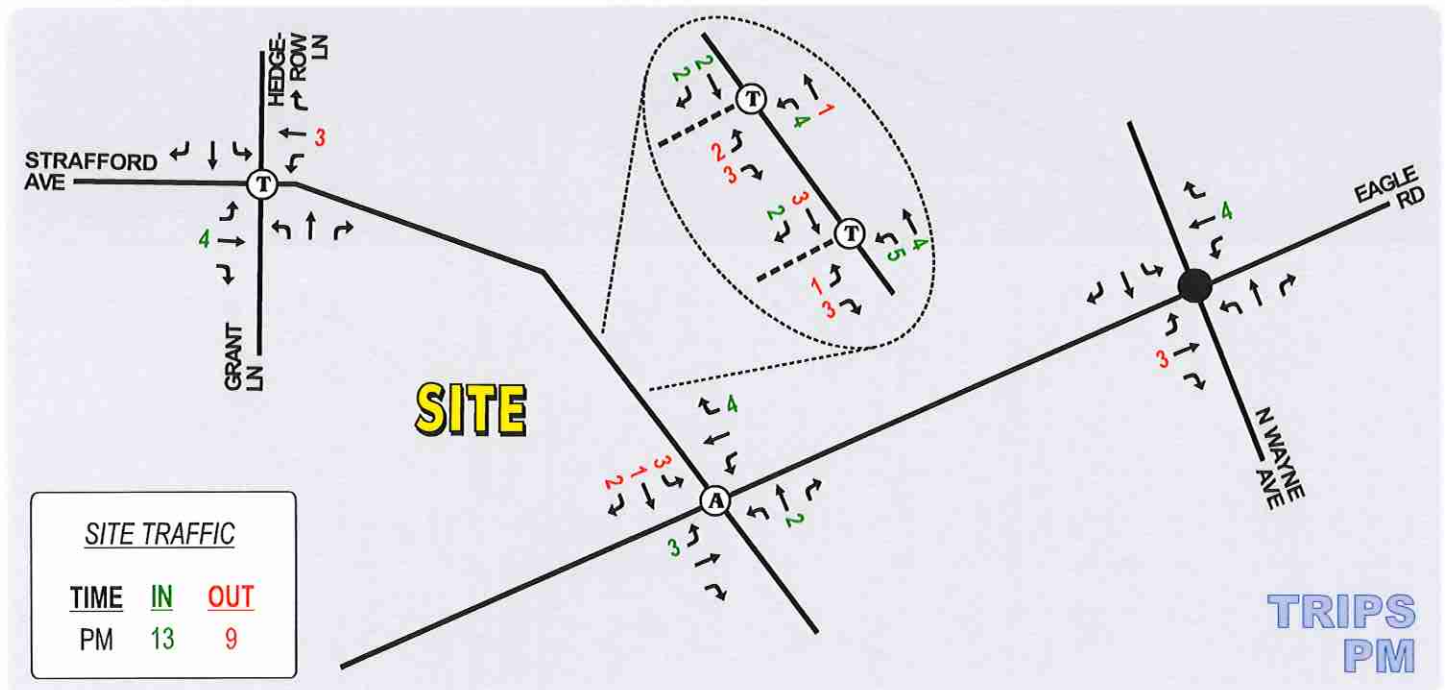
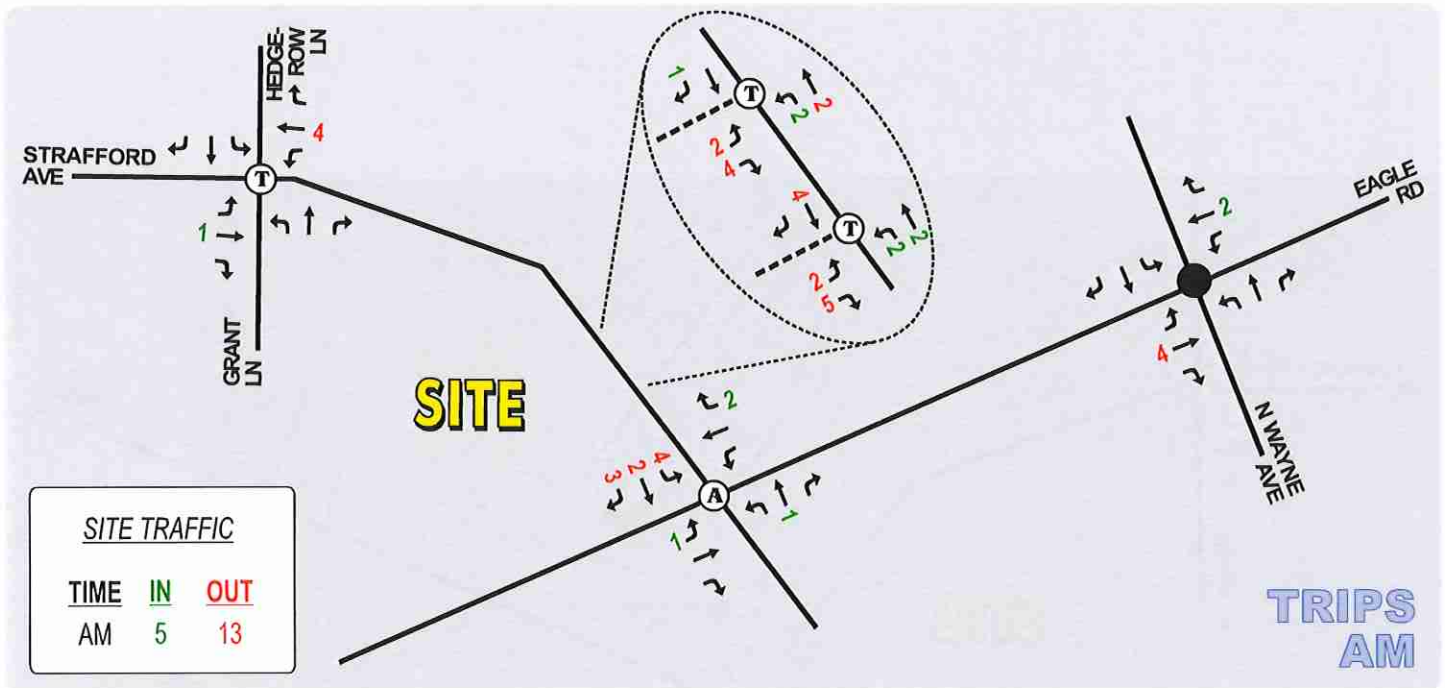
May 2023



Site Peak Hour Traffic – Volumes

Strafford Avenue Residential - 38 Townhouses
Radnor Township,
Delaware County, Pennsylvania

May 2023



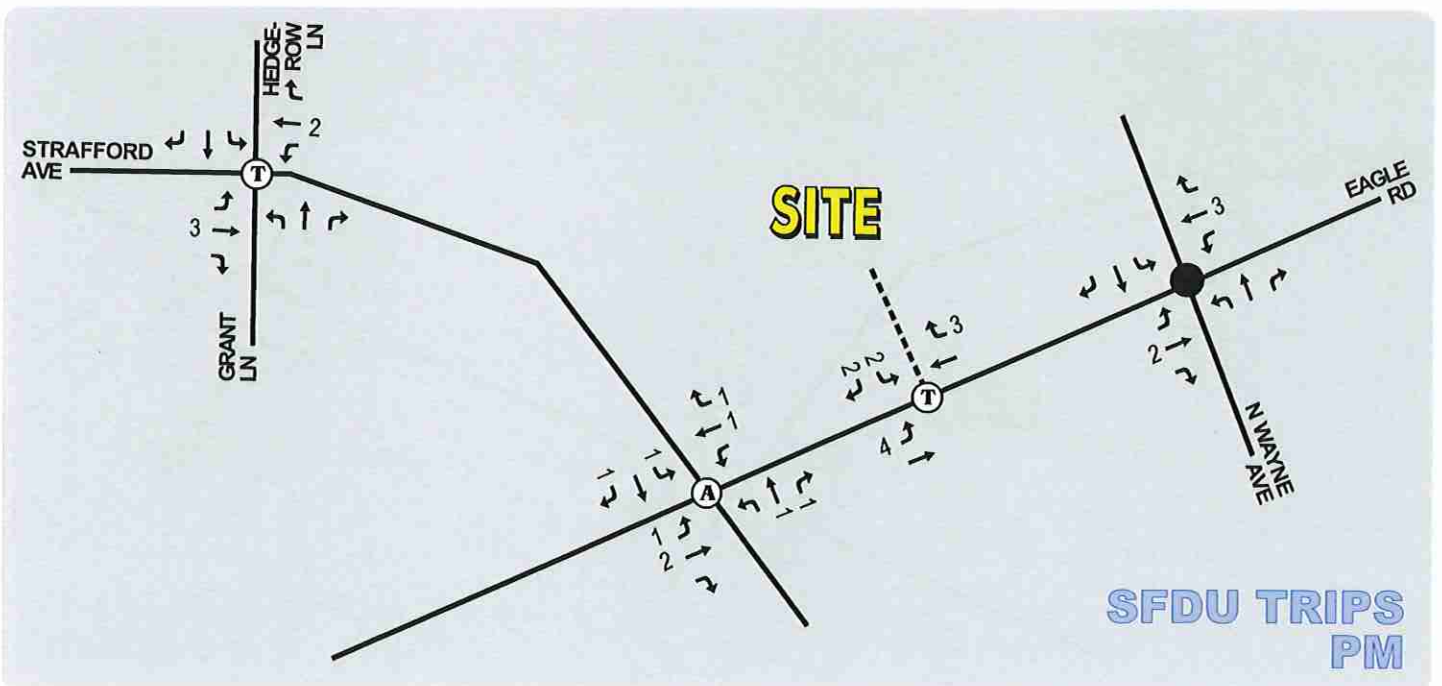
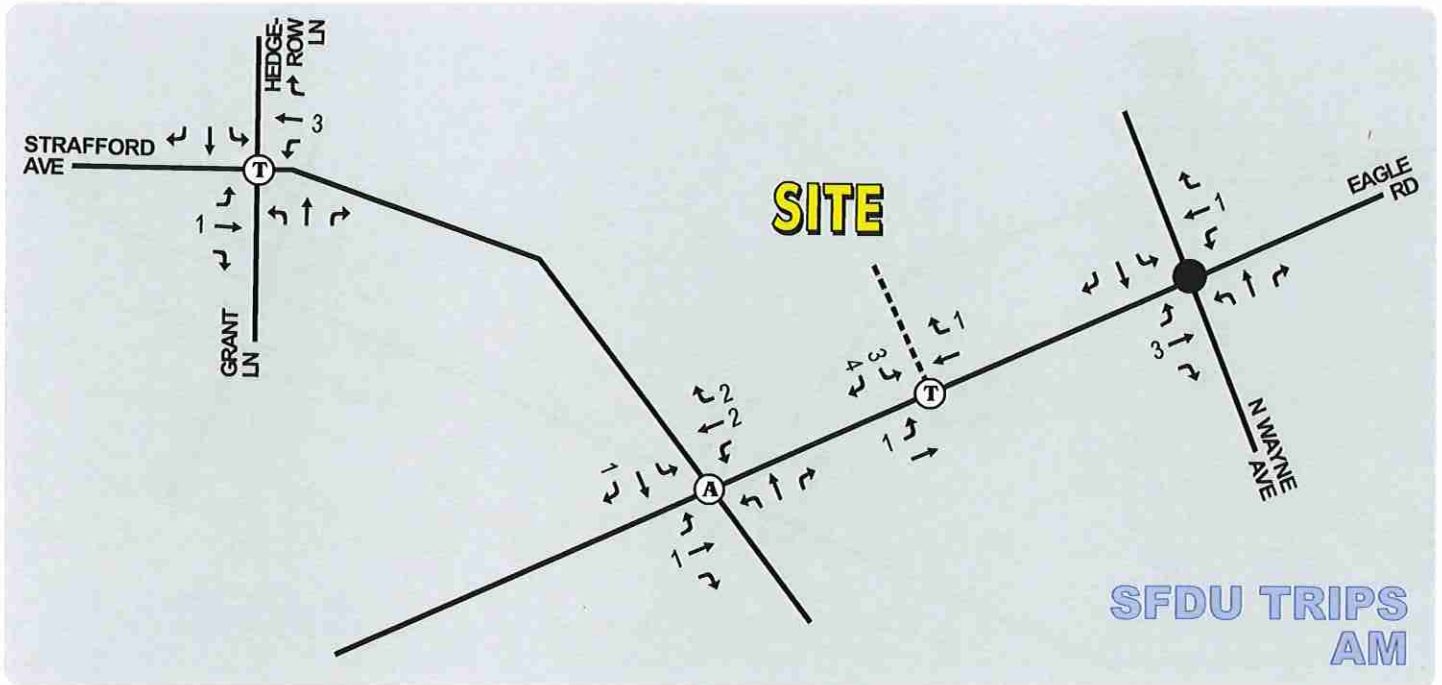
Other Development (St. Honore) Peak Hour Traffic Volumes

Strafford Avenue Residential - 38 Townhouses

Radnor Township, Delaware County, Pennsylvania



May 2023



● Signalized Intersection

Ⓐ Unsignalized Intersection, All-Way Stop Control

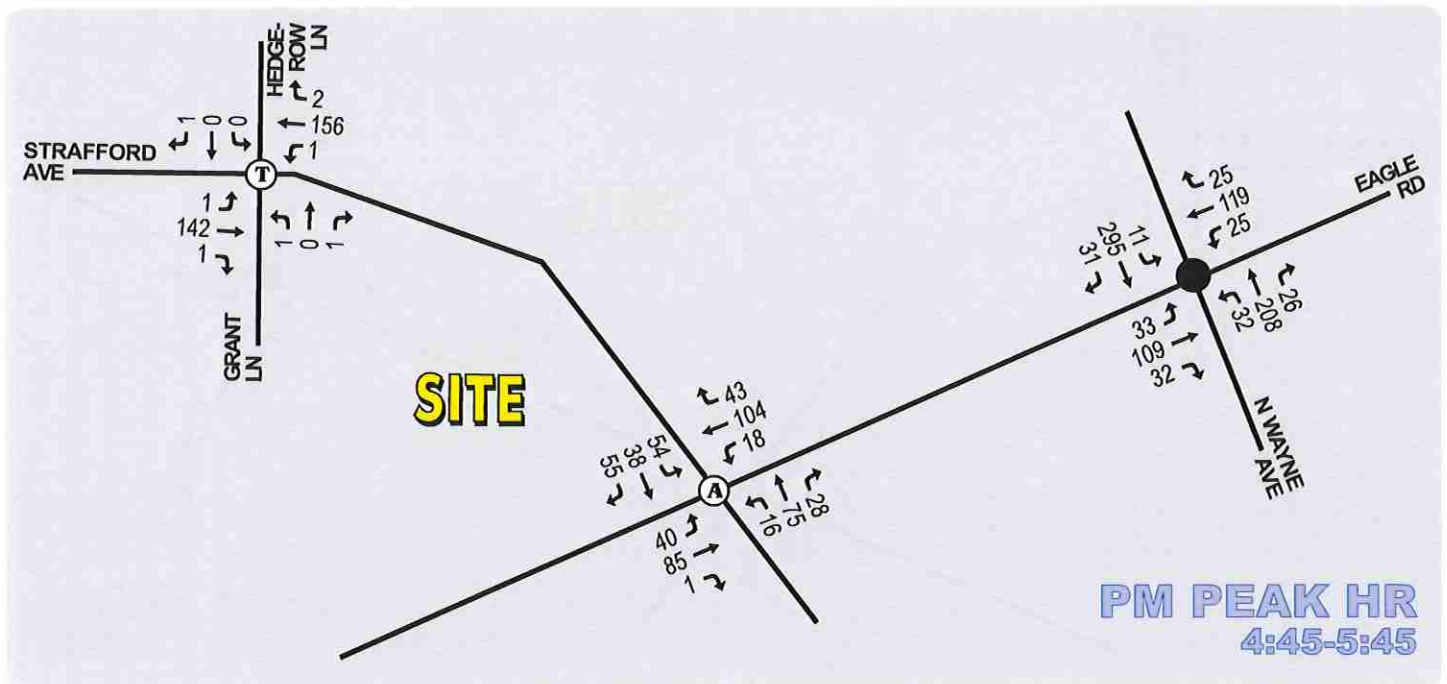
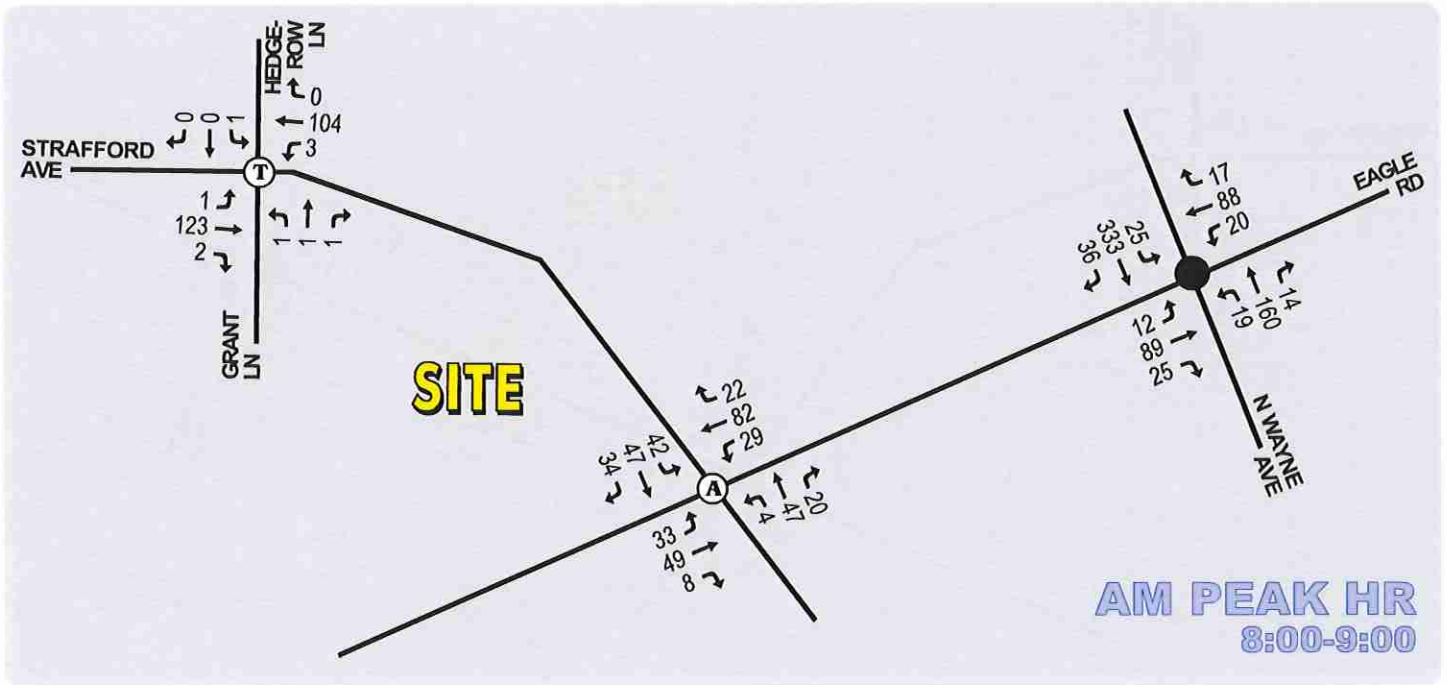
Ⓣ Unsignalized Intersection, Two-Way Stop Control (Side Street Only)

Future (2028) No Build Peak Hour Traffic Volumes

Strafford Avenue Residential - 38 Townhouses
 Radnor Township,
 Delaware County, Pennsylvania



May 2023

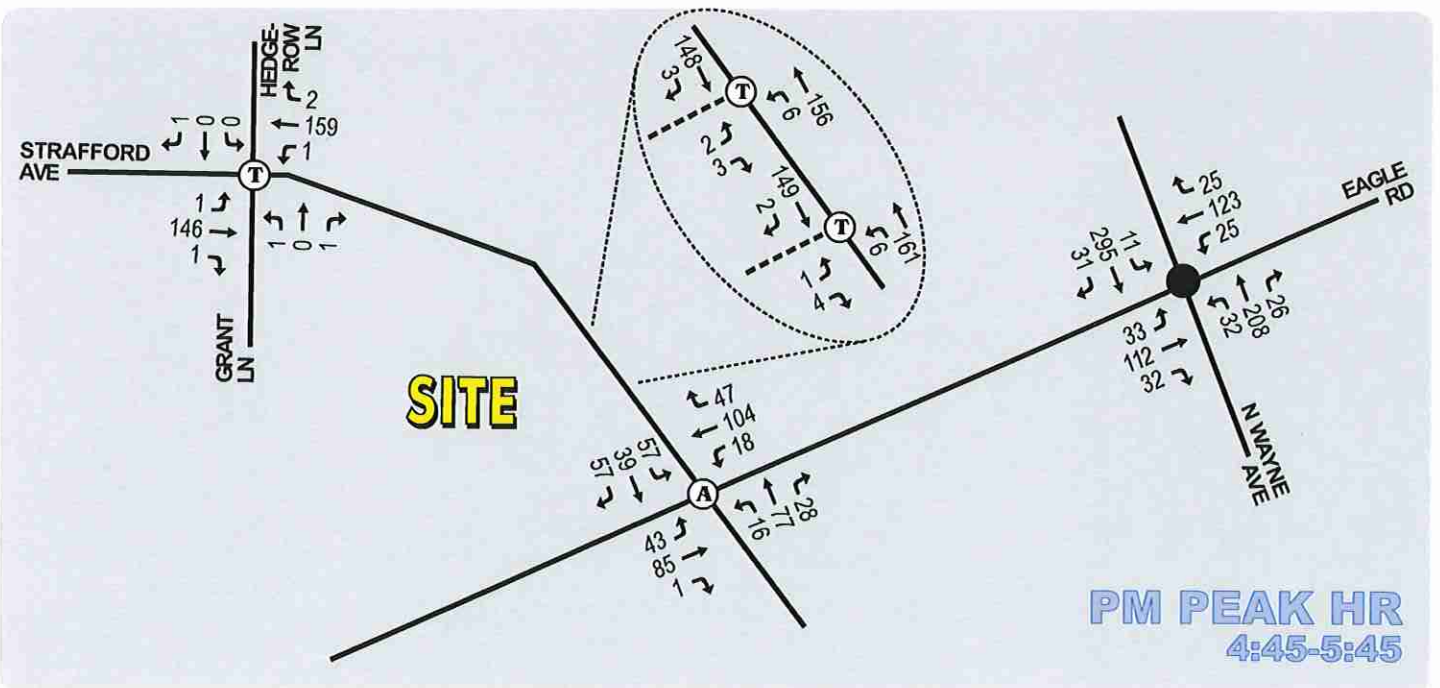
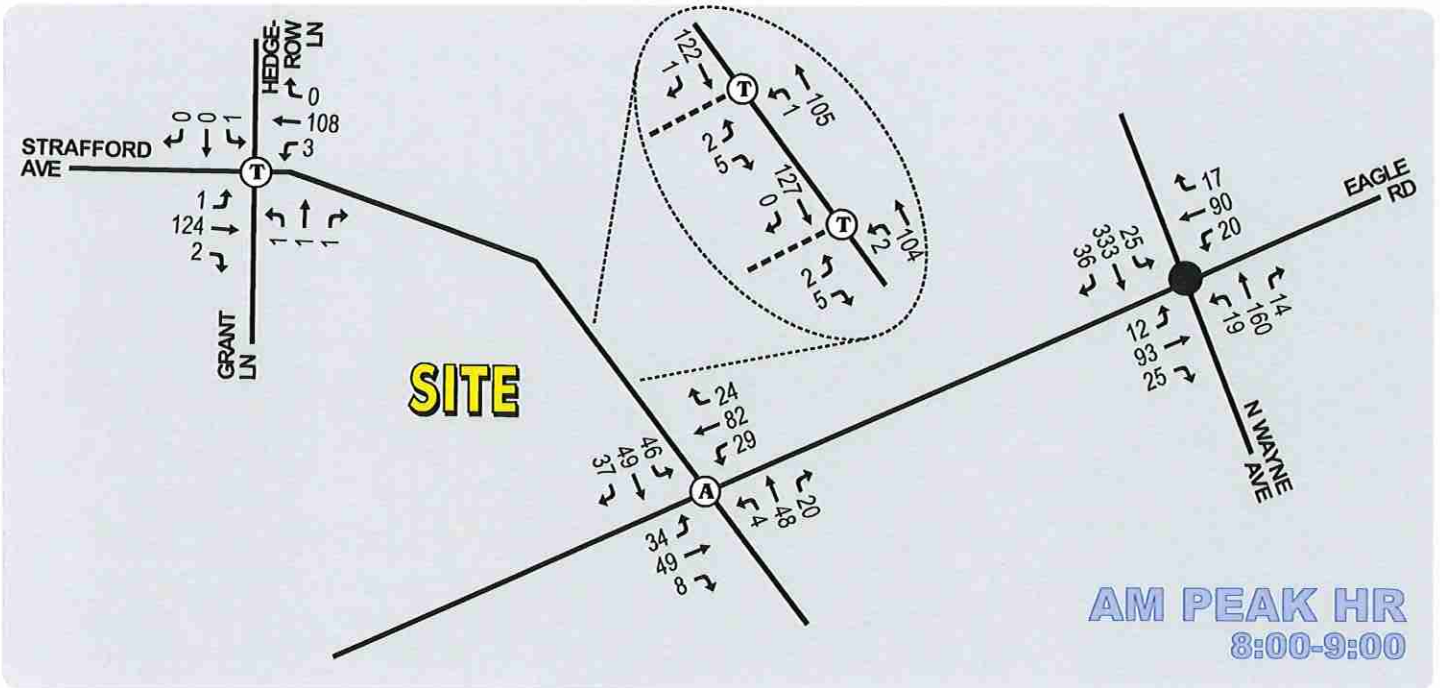


Future (2028) Build Peak Hour Traffic Volumes

Strafford Avenue Residential - 38 Townhouses
Radnor Township,
Delaware County, Pennsylvania



May 2023



APPENDIX A

Correspondence

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APPENDIX B

Photodocumentation

Job #: 219-011

Road name (# of pages)

1. Eagle Road & Strafford Road (3)
2. Strafford Avenue & Grant Lane/Hedgerow Lane (3)
3. Eagle Road & Wayne Avenue (3)



Aerial image of intersection



Photo # 1 - Description: Eastbound Strafford Road

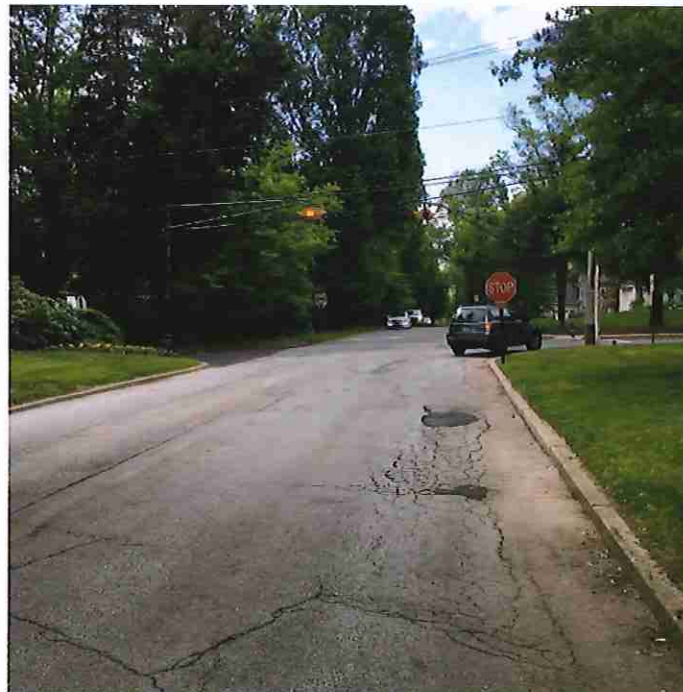


Photo # 2 - Description: Westbound Strafford Road



Photo # 3 - Description: Northbound Eagle Road

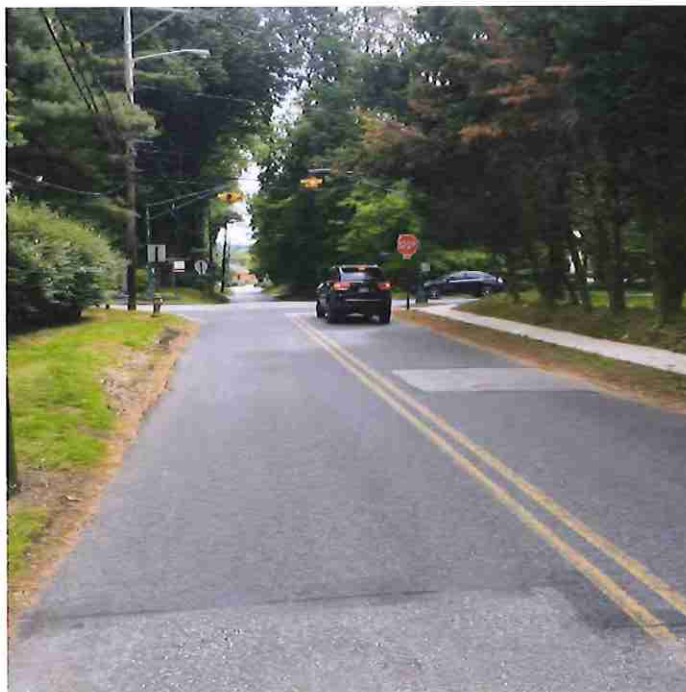
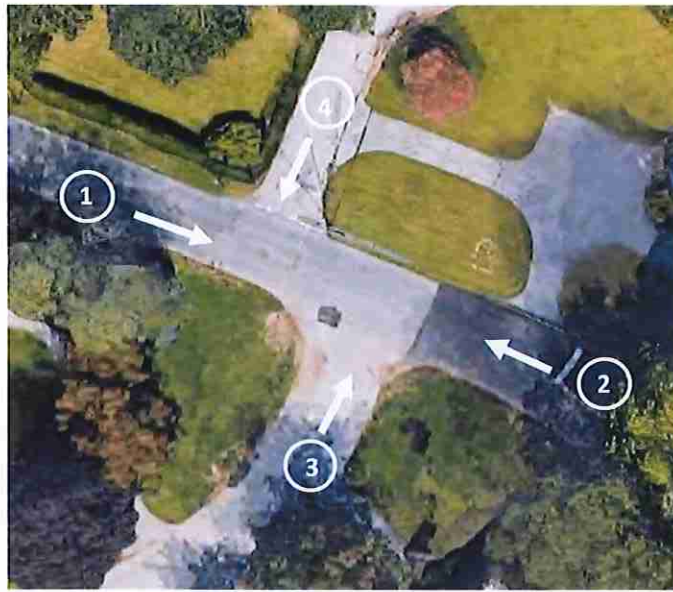


Photo # 4 - Description: Southbound Eagle Road



Aerial image of intersection



Photo # 1 - Description: Eastbound Strafford Road



Photo # 2 - Description: Westbound Strafford Road



Photo # 3 - Description: Northbound Grant Lane



Photo # 4 - Description: Southbound Hedgerow Lane



Aerial image of intersection



Photo # 1 - Description: Eastbound Wayne Avenue



Photo # 2 - Description: Westbound Wayne Avenue

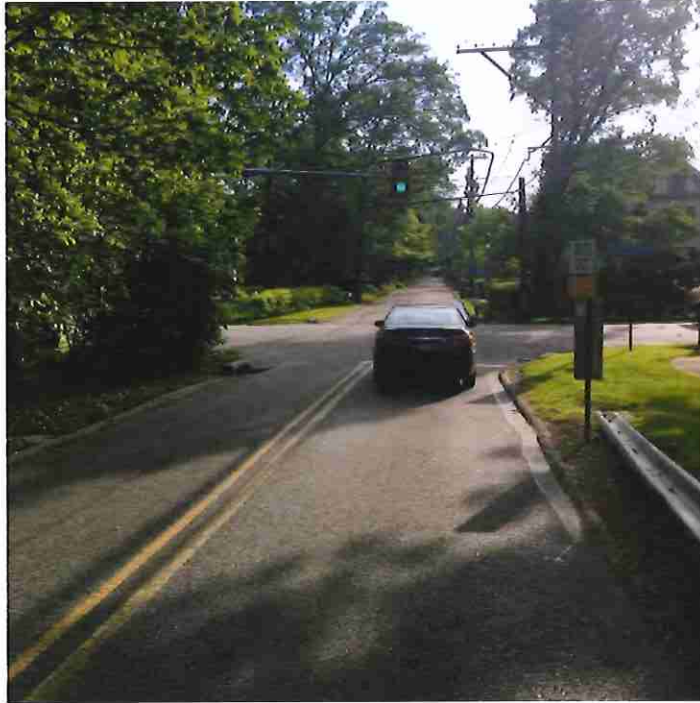


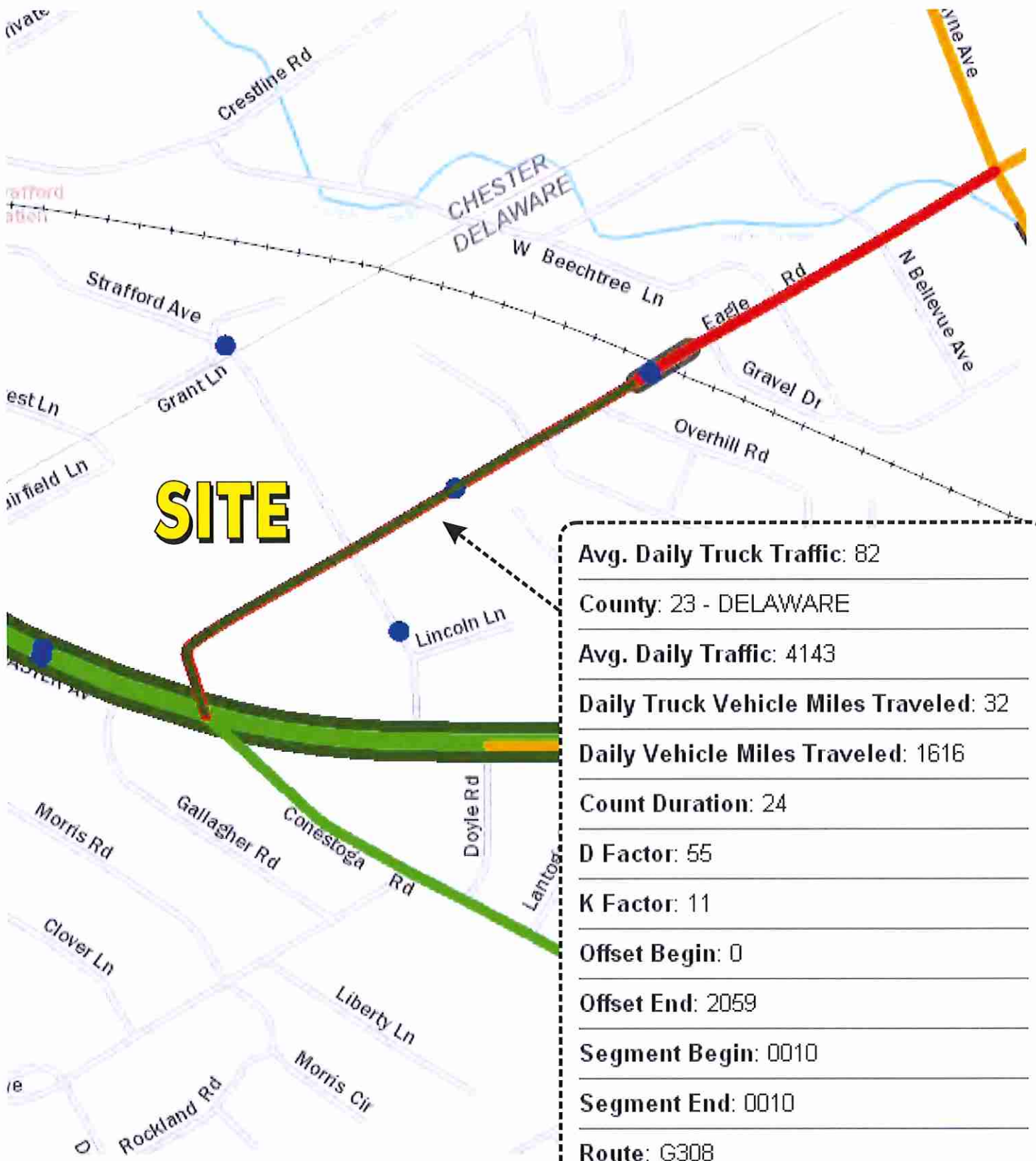
Photo # 3 - Description: Northbound Eagle Road



Photo # 4 - Description: Southbound Eagle Road

APPENDIX C

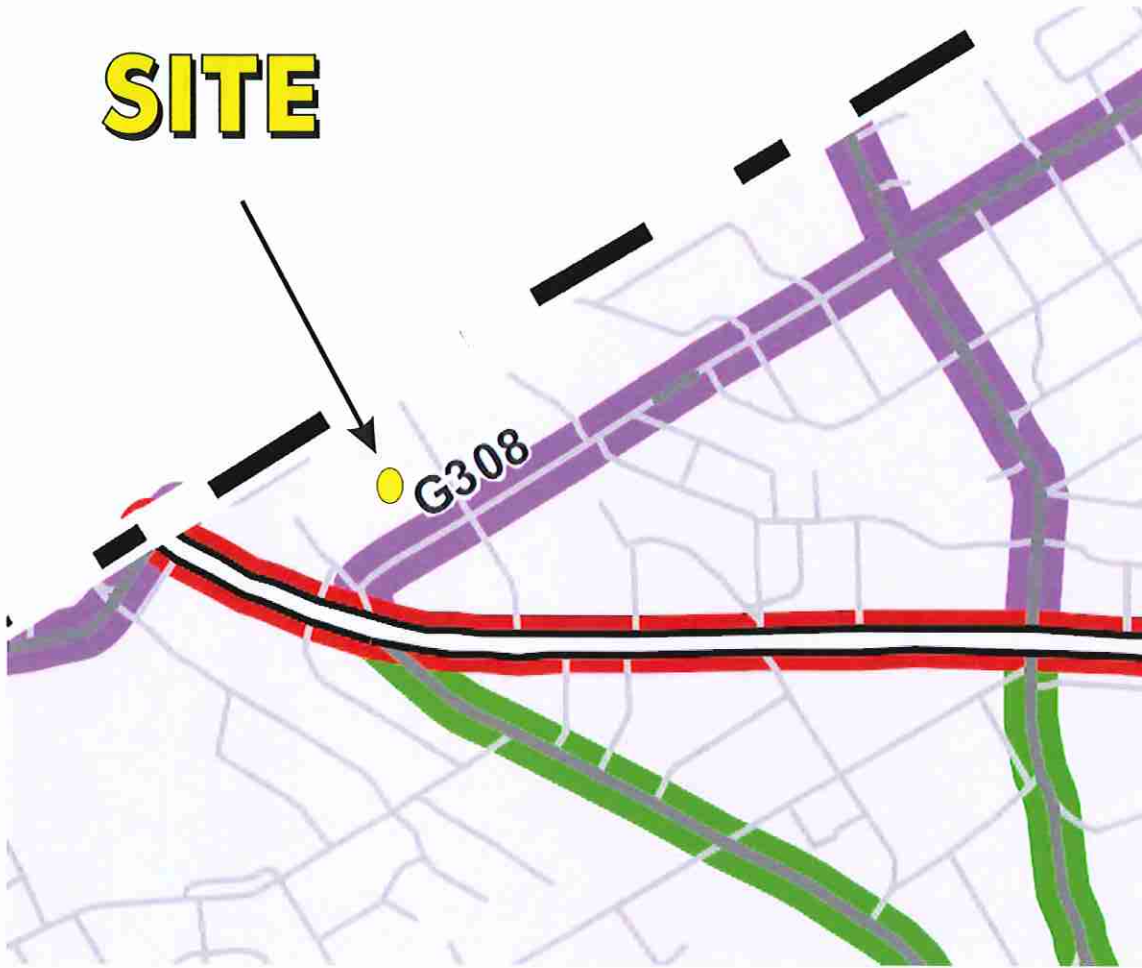
TIRe Data







Avg. Daily Truck Traffic: 82
County: 23 - DELAWARE
Avg. Daily Traffic: 4143
Daily Truck Vehicle Miles Traveled: 32
Daily Vehicle Miles Traveled: 1616
Count Duration: 24
D Factor: 55
K Factor: 11
Offset Begin: 0
Offset End: 2059
Segment Begin: 0010
Segment End: 0010
Route: G308
Traffic Pattern Group: 05 - URBAN - MINOR ARTERIALS, COLLECTORS, LOCAL ROADS
Truck Percent: 2

The data shown here was gathered from TIRE in 2019 and was based on a count conducted in 2014. A more recent visit to TIRE shows that 2020 count data is now the latest available, but since that count was conducted during the Covid pandemic it was approximately 50% lower than the ADT estimate shown here (4,141 vpd) and so was ignored.

SITE



-  INTERSTATE HIGHWAYS (1, 11)
-  OTHER FREEWAYS AND EXPRESSWAYS (12)
-  OTHER PRINCIPAL ARTERIAL HIGHWAYS (2, 14)
-  MINOR ARTERIALS (6, 16)
-  URBAN COLLECTOR OR RURAL MAJOR COLLECTOR (7, 17)
-  RURAL MINOR COLLECTOR (8)

APPENDIX D

Data Collection

File Name : 219-011_EagleGrant_1061751_04-27-2023
 Site Code : 219-011 EagleGrant
 Start Date : 4/27/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Strafford From North					Hedgerow From East					Strafford From South					Grant From West					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
07:00 AM	0	16	0	0	16	0	0	0	0	0	0	10	0	0	10	0	0	1	0	1	27
07:15 AM	0	32	1	0	33	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	43
07:30 AM	0	24	0	0	24	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	44
07:45 AM	0	32	0	0	32	0	0	0	0	0	1	25	1	0	27	1	0	1	0	2	61
Total	0	104	1	0	105	0	0	0	0	0	1	65	1	0	67	1	0	2	0	3	175
08:00 AM	0	35	1	0	36	0	0	0	0	0	1	21	0	0	22	1	0	0	0	1	59
08:15 AM	0	37	0	0	37	1	0	0	0	1	0	18	0	0	18	0	0	1	0	1	57
08:30 AM	1	20	0	0	21	0	0	0	0	0	1	30	0	0	31	0	0	0	0	0	52
08:45 AM	0	30	1	0	31	0	0	0	0	0	1	32	0	0	33	0	1	0	0	1	65
Total	1	122	2	0	125	1	0	0	0	1	3	101	0	0	104	1	1	1	0	3	233
04:00 PM	1	36	1	0	38	1	0	0	0	1	0	28	0	0	28	0	0	1	0	1	68
04:15 PM	0	25	1	0	26	1	0	0	0	1	0	32	0	0	32	0	0	1	0	1	60
04:30 PM	1	23	2	0	26	0	0	0	0	0	1	31	0	0	32	0	0	1	0	1	59
04:45 PM	1	39	0	0	40	0	0	1	0	1	0	47	0	2	49	0	0	1	0	1	91
Total	3	123	4	0	130	2	0	1	0	3	1	138	0	2	141	0	0	4	0	4	278
05:00 PM	0	28	1	0	29	0	0	0	0	0	0	40	1	0	41	0	0	0	0	0	70
05:15 PM	0	29	0	0	29	0	0	0	0	0	0	37	0	0	37	1	0	0	0	1	67
05:30 PM	0	43	0	0	43	0	0	0	0	0	1	30	1	0	32	0	0	0	0	0	75
05:45 PM	0	22	1	0	23	0	0	0	0	0	1	33	0	0	34	1	0	0	0	1	58
Total	0	122	2	0	124	0	0	0	0	0	2	140	2	0	144	2	0	0	0	2	270
Grand Total	4	471	9	0	484	3	0	1	0	4	7	444	3	2	456	4	1	7	0	12	956
Apprch %	0.8	97.3	1.9	0		75	0	25	0		1.5	97.4	0.7	0.4		33.3	8.3	58.3	0		
Total %	0.4	49.3	0.9	0	50.6	0.3	0	0.1	0	0.4	0.7	46.4	0.3	0.2	47.7	0.4	0.1	0.7	0	1.3	
Lights	4	462	9	0	475	3	0	1	0	4	5	441	3	2	451	3	0	7	0	10	940
% Lights	100	98.1	100	0	98.1	100	0	100	0	100	71.4	99.3	100	100	98.9	75	0	100	0	83.3	98.3
Buses	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	7
% Buses	0	0.8	0	0	0.8	0	0	0	0	0	0	0.7	0	0	0.7	0	0	0	0	0	0.7
Trucks	0	5	0	0	5	0	0	0	0	0	2	0	0	0	2	1	1	0	0	2	9
% Trucks	0	1.1	0	0	1	0	0	0	0	0	28.6	0	0	0	0.4	25	100	0	0	16.7	0.9

File Name : 219-011_EagleGrant_1061751_04-27-2023
 Site Code : 219-011 EagleGrant
 Start Date : 4/27/2023
 Page No : 2

Start Time	Strafford From North					Hedgerow From East					Strafford From South					Grant From West					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	35	1	0	36	0	0	0	0	0	1	21	0	0	22	1	0	0	0	1	59
08:15 AM	0	37	0	0	37	1	0	0	0	1	0	18	0	0	18	0	0	1	0	1	57
08:30 AM	1	20	0	0	21	0	0	0	0	0	1	30	0	0	31	0	0	0	0	0	52
08:45 AM	0	30	1	0	31	0	0	0	0	0	1	32	0	0	33	0	1	0	0	1	65
Total Volume	1	122	2	0	125	1	0	0	0	1	3	101	0	0	104	1	1	1	0	3	233
% App. Total	0.8	97.6	1.6	0		100	0	0	0		2.9	97.1	0	0		33.3	33.3	33.3	0		
PHF	.250	.824	.500	.000	.845	.250	.000	.000	.000	.250	.750	.789	.000	.000	.788	.250	.250	.250	.000	.750	.896
Lights	1	117	2	0	120	1	0	0	0	1	2	99	0	0	101	0	0	1	0	1	223
% Lights	100	95.9	100	0	96.0	100	0	0	0	100	66.7	98.0	0	0	97.1	0	0	100	0	33.3	95.7
Buses	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
% Buses	0	0.8	0	0	0.8	0	0	0	0	0	0	2.0	0	0	1.9	0	0	0	0	0	1.3
Trucks	0	4	0	0	4	0	0	0	0	0	1	0	0	0	1	1	1	0	0	2	7
% Trucks	0	3.3	0	0	3.2	0	0	0	0	0	33.3	0	0	0	1.0	100	100	0	0	66.7	3.0

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	39	0	0	40	0	0	1	0	1	0	47	0	2	49	0	0	1	0	1	91
05:00 PM	0	28	1	0	29	0	0	0	0	0	0	40	1	0	41	0	0	0	0	0	70
05:15 PM	0	29	0	0	29	0	0	0	0	0	0	37	0	0	37	1	0	0	0	1	67
05:30 PM	0	43	0	0	43	0	0	0	0	0	1	30	1	0	32	0	0	0	0	0	75
Total Volume	1	139	1	0	141	0	0	1	0	1	1	154	2	2	159	1	0	1	0	2	303
% App. Total	0.7	98.6	0.7	0		0	0	100	0		0.6	96.9	1.3	1.3		50	0	50	0		
PHF	.250	.808	.250	.000	.820	.000	.000	.250	.000	.250	.250	.819	.500	.250	.811	.250	.000	.250	.000	.500	.832
Lights	1	139	1	0	141	0	0	1	0	1	1	154	2	2	159	1	0	1	0	2	303
% Lights	100	100	100	0	100	0	0	100	0	100	100	100	100	100	100	100	0	100	0	100	100
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name : 219-011_Signal_1061742_04-27-2023
 Site Code : 219-011 Signal
 Start Date : 4/27/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Wayne From North					Eagle From East					Wayne From South					Eagle From West					InL Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
07:00 AM	1	41	5	0	47	2	6	0	0	8	1	16	6	0	23	2	5	2	0	9	87
07:15 AM	3	58	10	0	71	6	10	3	0	19	0	16	3	0	19	1	14	5	0	20	129
07:30 AM	5	79	6	0	90	8	13	2	0	23	6	19	8	0	33	1	18	5	0	24	170
07:45 AM	10	88	4	0	102	4	14	2	0	20	7	36	9	0	52	7	17	12	0	36	210
Total	19	266	25	0	310	20	43	7	0	70	14	87	26	0	127	11	54	24	0	89	596
08:00 AM	5	85	9	0	99	8	18	5	0	31	8	45	4	0	57	4	30	6	0	40	227
08:15 AM	2	99	5	0	106	5	21	6	0	32	2	43	5	0	50	1	26	7	0	34	222
08:30 AM	14	66	7	0	87	2	30	3	0	35	3	36	2	0	41	5	17	8	0	30	193
08:45 AM	4	83	15	0	102	5	18	3	0	26	6	36	3	0	45	2	13	4	0	19	192
Total	25	333	36	0	394	20	87	17	0	124	19	160	14	0	193	12	86	25	0	123	834
04:00 PM	2	63	4	0	69	4	28	7	0	39	7	59	5	0	71	6	23	4	0	33	212
04:15 PM	4	36	8	0	48	6	26	3	0	35	5	53	6	0	64	10	20	6	0	36	183
04:30 PM	6	58	7	0	71	7	27	9	0	43	4	47	4	0	55	7	17	6	0	30	199
04:45 PM	1	69	6	0	76	4	30	10	0	44	11	42	5	0	58	9	30	7	0	46	224
Total	13	226	25	0	264	21	111	29	0	161	27	201	20	0	248	32	90	23	0	145	818
05:00 PM	5	69	3	0	77	3	19	7	0	29	7	56	11	0	74	7	27	8	0	42	222
05:15 PM	2	87	13	0	102	8	35	6	0	49	7	48	4	0	59	6	25	8	0	39	249
05:30 PM	3	70	9	0	82	10	32	2	0	44	7	62	6	0	75	11	25	9	0	45	246
05:45 PM	5	72	2	0	79	8	30	4	0	42	9	52	9	0	70	6	15	3	0	24	215
Total	15	298	27	0	340	29	116	19	0	164	30	218	30	0	278	30	92	28	0	150	932
Grand Total	72	1123	113	0	1308	90	357	72	0	519	90	666	90	0	846	85	322	100	0	507	3180
Apprch %	5.5	85.9	8.6	0		17.3	68.8	13.9	0		10.6	78.7	10.6	0		16.8	63.5	19.7	0		
Total %	2.3	35.3	3.6	0	41.1	2.8	11.2	2.3	0	16.3	2.8	20.9	2.8	0	26.6	2.7	10.1	3.1	0	15.9	
Lights	70	1097	110	0	1277	83	349	69	0	501	89	652	88	0	829	84	320	97	0	501	3108
% Lights	97.2	97.7	97.3	0	97.6	92.2	97.8	95.8	0	96.5	98.9	97.9	97.8	0	98	98.8	99.4	97	0	98.8	97.7
Buses	0	9	0	0	9	1	3	2	0	6	0	4	1	0	5	0	1	1	0	2	22
% Buses	0	0.8	0	0	0.7	1.1	0.8	2.8	0	1.2	0	0.6	1.1	0	0.6	0	0.3	1	0	0.4	0.7
Trucks	2	17	3	0	22	6	5	1	0	12	1	10	1	0	12	1	1	2	0	4	50
% Trucks	2.8	1.5	2.7	0	1.7	6.7	1.4	1.4	0	2.3	1.1	1.5	1.1	0	1.4	1.2	0.3	2	0	0.8	1.6

File Name : 219-011_Signal_1061742_04-27-2023
 Site Code : 219-011 Signal
 Start Date : 4/27/2023
 Page No : 2

Start Time	Wayne From North					Eagle From East					Wayne From South					Eagle From West					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	5	85	9	0	99	8	18	5	0	31	8	45	4	0	57	4	30	6	0	40	227
08:15 AM	2	99	5	0	106	5	21	6	0	32	2	43	5	0	50	1	26	7	0	34	222
08:30 AM	14	66	7	0	87	2	30	3	0	35	3	36	2	0	41	5	17	8	0	30	193
08:45 AM	4	83	15	0	102	5	18	3	0	26	6	36	3	0	45	2	13	4	0	19	192
Total Volume	25	333	36	0	394	20	87	17	0	124	19	160	14	0	193	12	86	25	0	123	834
% App. Total	6.3	84.5	9.1	0		16.1	70.2	13.7	0		9.8	82.9	7.3	0		9.8	69.9	20.3	0		
PHF	.446	.841	.600	.000	.929	.625	.725	.708	.000	.886	.594	.889	.700	.000	.846	.600	.717	.781	.000	.769	.919
Lights	24	319	36	0	379	16	85	16	0	117	19	157	14	0	190	12	85	25	0	122	808
% Lights	96.0	95.8	100	0	96.2	80.0	97.7	94.1	0	94.4	100	98.1	100	0	98.4	100	98.8	100	0	99.2	96.9
Buses	0	3	0	0	3	1	1	1	0	3	0	1	0	0	1	0	1	0	0	1	8
% Buses	0	0.9	0	0	0.8	5.0	1.1	5.9	0	2.4	0	0.6	0	0	0.5	0	1.2	0	0	0.8	1.0
Trucks	1	11	0	0	12	3	1	0	0	4	0	2	0	0	2	0	0	0	0	0	18
% Trucks	4.0	3.3	0	0	3.0	15.0	1.1	0	0	3.2	0	1.3	0	0	1.0	0	0	0	0	0	2.2

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	69	6	0	76	4	30	10	0	44	11	42	5	0	58	9	30	7	0	46	224
05:00 PM	5	69	3	0	77	3	19	7	0	29	7	56	11	0	74	7	27	8	0	42	222
05:15 PM	2	87	13	0	102	8	35	6	0	49	7	48	4	0	59	6	25	8	0	39	249
05:30 PM	3	70	9	0	82	10	32	2	0	44	7	62	6	0	75	11	25	9	0	45	246
Total Volume	11	295	31	0	337	25	116	25	0	166	32	208	26	0	266	33	107	32	0	172	941
% App. Total	3.3	87.5	9.2	0		15.1	69.9	15.1	0		12	78.2	9.8	0		19.2	62.2	18.6	0		
PHF	.550	.848	.596	.000	.826	.625	.829	.625	.000	.847	.727	.839	.591	.000	.887	.750	.892	.889	.000	.935	.945
Lights	10	294	31	0	335	25	115	24	0	164	32	207	25	0	264	33	107	32	0	172	935
% Lights	90.9	99.7	100	0	99.4	100	99.1	96.0	0	98.8	100	99.5	96.2	0	99.2	100	100	100	0	100	99.4
Buses	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Buses	0	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Trucks	1	0	0	0	1	0	1	1	0	2	0	1	1	0	2	0	0	0	0	0	5
% Trucks	9.1	0	0	0	0.3	0	0.9	4.0	0	1.2	0	0.5	3.8	0	0.8	0	0	0	0	0	0.5

File Name : 219-011_EagleStraff_1061748_04-27-2023
 Site Code : 219-011 EagleStraff
 Start Date : 4/27/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Strafford From North					Eagle From East					Strafford From South					Eagle From West					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
07:00 AM	2	10	4	0	16	1	5	3	0	9	0	6	5	0	11	1	7	0	0	8	44
07:15 AM	7	14	10	0	31	5	19	3	0	27	1	4	1	0	6	3	10	0	0	13	77
07:30 AM	6	11	6	0	23	2	14	3	0	19	0	12	2	0	14	5	10	0	0	15	71
07:45 AM	15	14	6	0	35	3	27	6	0	36	0	10	2	0	12	11	16	2	0	29	112
Total	30	49	26	0	105	11	65	15	0	91	1	32	10	0	43	20	43	2	0	65	304
08:00 AM	11	15	10	0	36	6	15	5	0	26	1	11	7	0	19	4	18	3	0	25	106
08:15 AM	15	13	8	0	36	8	20	4	0	32	1	8	4	0	13	7	9	3	0	19	100
08:30 AM	7	8	6	0	21	6	20	4	0	30	1	17	5	0	23	10	8	1	0	19	93
08:45 AM	9	11	9	0	29	9	25	8	0	42	1	11	4	0	16	12	13	1	0	26	113
Total	42	47	33	0	122	29	80	21	0	130	4	47	20	0	71	33	48	8	0	89	412
04:00 PM	9	16	10	0	35	3	29	11	0	43	1	12	4	0	17	6	15	2	0	23	118
04:15 PM	8	13	9	0	30	9	26	10	0	45	5	12	6	0	23	9	15	1	0	25	123
04:30 PM	4	9	10	0	23	3	25	4	0	32	2	20	8	0	30	9	20	1	0	30	115
04:45 PM	15	9	19	0	43	2	26	15	0	43	7	21	10	0	38	12	23	1	0	36	160
Total	36	47	48	0	131	17	106	40	0	163	15	65	28	0	108	36	73	5	0	114	516
05:00 PM	13	6	11	0	30	3	21	12	0	36	2	19	3	0	24	9	20	0	0	29	119
05:15 PM	13	10	7	0	30	6	28	12	0	46	3	15	8	0	26	11	14	0	0	25	127
05:30 PM	12	13	17	0	42	7	28	3	0	38	4	19	6	0	29	7	26	0	0	33	142
05:45 PM	7	6	7	0	20	2	33	8	0	43	3	19	2	0	24	8	11	1	0	20	107
Total	45	35	42	0	122	18	110	35	0	163	12	72	19	0	103	35	71	1	0	107	495
Grand Total	153	178	149	0	480	75	361	111	0	547	32	216	77	0	325	124	235	16	0	375	1727
Apprch %	31.9	37.1	31	0		13.7	66	20.3	0		9.8	66.5	23.7	0		33.1	62.7	4.3	0		
Total %	8.9	10.3	8.6	0	27.8	4.3	20.9	6.4	0	31.7	1.9	12.5	4.5	0	18.8	7.2	13.6	0.9	0	21.7	
Lights	149	177	144	0	470	72	352	108	0	532	32	216	75	0	323	122	234	16	0	372	1697
% Lights	97.4	99.4	96.6	0	97.9	96	97.5	97.3	0	97.3	100	100	97.4	0	99.4	98.4	99.6	100	0	99.2	98.3
Buses	3	0	2	0	5	0	4	1	0	5	0	0	0	0	0	2	0	0	0	2	12
% Buses	2	0	1.3	0	1	0	1.1	0.9	0	0.9	0	0	0	0	0	1.6	0	0	0	0.5	0.7
Trucks	1	1	3	0	5	3	5	2	0	10	0	0	2	0	2	0	1	0	0	1	18
% Trucks	0.7	0.6	2	0	1	4	1.4	1.8	0	1.8	0	0	2.6	0	0.6	0	0.4	0	0	0.3	1

File Name : 219-011_EagleStraff_1061748_04-27-2023
 Site Code : 219-011_EagleStraff
 Start Date : 4/27/2023
 Page No : 2

Start Time	Strafford From North					Eagle From East					Strafford From South					Eagle From West					Int. Total	
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total		
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 08:00 AM																						
08:00 AM	11	15	10	0	36	6	15	5	0	26	1	11	7	0	19	4	18	3	0	25	106	
08:15 AM	15	13	8	0	36	8	20	4	0	32	1	8	4	0	13	7	9	3	0	19	100	
08:30 AM	7	8	6	0	21	6	20	4	0	30	1	17	5	0	23	10	8	1	0	19	93	
08:45 AM	9	11	9	0	29	9	25	8	0	42	1	11	4	0	16	12	13	1	0	26	113	
Total Volume	42	47	33	0	122	29	80	21	0	130	4	47	20	0	71	33	48	8	0	89	412	
% App. Total	34.4	38.5	27	0		22.3	61.5	16.2	0		5.6	66.2	28.2	0		37.1	53.9	9	0			
PHF	.700	.783	.825	.000	.847	.806	.800	.656	.000	.774	1.00	.691	.714	.000	.772	.688	.667	.667	.000	.856	.912	
Lights	40	46	31	0	117	28	78	19	0	125	4	47	20	0	71	32	48	8	0	88	401	
% Lights	95.2	97.9	93.9	0	95.9	96.6	97.5	90.5	0	96.2	100	100	100	0	100	97.0	100	100	0	98.9	97.3	
Buses	1	0	0	0	1	0	2	1	0	3	0	0	0	0	0	1	0	0	0	0	1	5
% Buses	2.4	0	0	0	0.8	0	2.5	4.8	0	2.3	0	0	0	0	0	3.0	0	0	0	0	1.1	1.2
Trucks	1	1	2	0	4	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	6
% Trucks	2.4	2.1	6.1	0	3.3	3.4	0	4.8	0	1.5	0	0	0	0	0	0	0	0	0	0	0	1.5

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 04:45 PM																						
04:45 PM	15	9	19	0	43	2	26	15	0	43	7	21	10	0	38	12	23	1	0	36	160	
05:00 PM	13	6	11	0	30	3	21	12	0	36	2	19	3	0	24	9	20	0	0	29	119	
05:15 PM	13	10	7	0	30	6	28	12	0	46	3	15	8	0	26	11	14	0	0	25	127	
05:30 PM	12	13	17	0	42	7	28	3	0	38	4	19	6	0	29	7	26	0	0	33	142	
Total Volume	53	38	54	0	145	18	103	42	0	163	16	74	27	0	117	39	83	1	0	123	548	
% App. Total	36.6	26.2	37.2	0		11	63.2	25.8	0		13.7	63.2	23.1	0		31.7	67.5	0.8	0			
PHF	.883	.731	.711	.000	.843	.643	.920	.700	.000	.886	.571	.881	.675	.000	.770	.813	.798	.250	.000	.854	.856	
Lights	53	38	54	0	145	18	102	42	0	162	16	74	27	0	117	39	83	1	0	123	547	
% Lights	100	100	100	0	100	100	99.0	100	0	99.4	100	100	100	0	100	100	100	100	0	100	99.8	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	1.0	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0.2



**Radnor Township School District
2022-2023
Instructional Calendar
School Board Approved 2/22/2022**

**REVISED Calendar
School Board Approved
4/25/2023**

JULY 2022						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						
AUGUST 2022						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
SEPTEMBER 2022						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	
OCTOBER 2022						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
NOVEMBER 2022						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			
DECEMBER 2022						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUL 4	○	District Holiday	All Buildings Closed
AUG 15		PIAA High School Sports begin	
AUG 24-25		Teacher Induction	
AUG 29-SEP 1	△	Teacher In-Service ^	No Students K-12
SEP 2	△	Teacher Flex In-Service^	No Students K-12
SEP 5	○	District Holiday	All Buildings Closed
SEP 6	◇	First Student Day K-12	
SEP 21	◇	2 Hour Delay Teacher In-Service	Late Start K-12
SEP 26	☆	Offices Open/No School	
OCT 5	☆	Offices Open/No School	
OCT 19	◇	2 Hour Delay Teacher In-Service	Late Start K-12
NOV 8	△	Teacher In-Service ^	No Students K-12
NOV 17, 21, 22	◇	Evening Parent Conferences 6-12	Full Student Day
NOV 21	◇	Evening Parent Conferences K-5	Full Student Day
NOV 22	◇	Parent Conferences K-5	No Students K-5
NOV 23	◇	Parent Conferences K-12^	No Students K-12
NOV 24-25	○	District Holiday	All Buildings Closed
DEC 9	◇	Assessment Day K-5	No Students K-5
DEC 14	◇	2 Hour Delay Teacher In-Service	Late Start K-12
DEC 23	△	Teacher Flex In-Service^	No Students K-12
DEC 26-27	○	District Holiday	All Buildings Closed
DEC 28	☆	Offices Open/No School	No Students K-12
DEC 29-JAN 2	○	District Holiday	All Buildings Closed
JAN 16	○	District Holiday	All Buildings Closed
FEB 15	◇	2 Hour Delay Teacher In-Service	Late Start K-12
FEB 20	○	District Holiday	All Buildings Closed
MAR 10	◇	Assessment Day K-5	No Students K-5
MAR 16	◇	Evening Parent Conferences K-5	Full Student Day
MAR 17	◇	2 Hour Delay Teacher In-Service	Late Start 6-12
MAR 17	◇	Parent Conferences K-5	No Students K-5
APR 3-6	☆	Offices Open/No School	No Students K-12
APR 7	○	District Holiday	All Buildings Closed
APR 21	△	Teacher In-Service^	No Students K-12
May 16	△	Teacher In-Service^	No Students K-12
MAY 29	○	District Holiday	All Buildings Closed
JUN 7	□	RHS Graduation	
JUN 9	◇	Assessment Day K-5	No Students K-5
JUN 15	◇	Last Student Day / Early Dismissal (K-12)	
JUN 16	△	Teacher In-Service	No Students K-12
JUN 19	○	District Holiday	All Buildings Closed

^Proposed ACT 80 Days

PSSA Testing Window

April 24-28: English Language Arts (3-8)

May 1 - 12: Mathematics (3-8)

May 1-12: Science (3-8)

Keystone Testing Window

Winter: December 5-16

Spring: May 15-26

Radnor High School Testing Window*

Midterms: Jan 25-27

Senior Finals: May 31, June 1 & 2

Underclassmen Finals: TBD based on Emergency Closure Days

*RHS midterm & final testing dates may be adjusted due to weather emergency days.

The revised 2022-2023 calendar has removed the three built-in emergency school closure days. If emergency school closure days are needed, additional school days will be added onto the end of the school year beginning June 16.

Student Emergency Make-Up Days

Canceled student days will be made up as follows:

Day 4: June 16













Day 6: June 21

Day 5: June 20

Day 7: June 22

JANUARY 2023						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				
FEBRUARY 2023						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				
MARCH 2023						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
APRIL 2023						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						
MAY 2023						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
JUNE 2023						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

**RADNOR TOWNSHIP SCHOOL DISTRICT
2022-2023 SCHOOL CALENDAR**

	District Holiday
	¼ day early dismissal 6-12 ONLY
	½ day PM early dismissal K-12
	K-12 Teacher In-service
	K-5 Teacher In-service
	Parent Teacher Conferences
	Offices Open/No School
	Parent Conferences
	K-12 Early Dismissal
	Graduation
	Student Weather Emergency Make-Up Day
	First Student Day K-12

END OF MARKING PERIOD (MP)

ELEMENTARY
MP1: 12/7/2022
MP2: 3/17/2023
MP3: 6/15/2023

MIDDLE SCHOOL
MP1: 11/11/2022
MP2: 1/27/2023
MP3: 4/14/2023
MP4: 6/15/2023

HIGH SCHOOL
MP1: 11/11/2022
MP2: 1/27/2023
MP3: 4/14/2023
MP4: 6/15/2023

2022—Calendar—2023

NOTE: First full day for ALL students Gr. 1 - 12: August 29, 2022; 1st day for Kindergarten students: September 6, 2022
 Tentative Last Day for students: June 14, 2023 (1/2 day) No Kindergarten students report
 Tentative Last Teacher Day: June 16, 2023

AUGUST							SEPTEMBER							OCTOBER							NOVEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6				△	△	3							1		1	2	3	4	5		
7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
28	△	△	△				25	26	27	28	29	30	23	24	25	26	27	28	29	27	28	29	30				
													30	31													
DECEMBER							JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7			1	2	3	4				1	2	3	4	
4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11	5	6	7	8	9	10	11
11	12	13	14	●	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25	19	20	21	22	23	24	25
25	26	27	28	29	30	31	29	30	31					26	27	28				26	27	28	29	30	31		
APRIL							MAY							JUNE							MS/HS Marking Periods						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S							
						1		1	2	3	4	5	6	9			1	2	3	August 29- Nov.4... .47 Days							
2	3	4	5	6	7	8	7	8	9	10	11	12	13	4	5	6	7	8	9	10	Nov. 7 - Jan. 20.....42 Days						
9	10	11	12	13	14	15	14	15	16	17	18	19	20	11	12	13	14	15	16	17	Jan. 23 - March 31....48 Days						
16	17	18	19	20	21	22	21	22	23	24	25	26	27	18	19	20	21	22	23	24	April 10 - June 14.... .45 Days						
23	24	25	26	27	28	29	28	29	30	31				25	26	27	28	29	30								
30																											

KEY

- ☐ = No School
- △ = Kindergarten Screening & Parent Conferences, no Kindergarten
- ⌊ = 1/2 Day: Elem. Parent Conferences, Gr. 1-4, no Kindergarten
- ▤ = 1/2 Day: Elementary / MS Parent Conferences, Gr. 1-8, no Kindergarten
- ⊙ = Districtwide Parent Conference Day, no school for students
- ⊘ = New Teacher Inservice, no school for students
- = Instr. Staff Inservice, no school for students
- ◐ = 1/2 Day for Gr. 1-12, no Kindergarten/ 1/2 Day Staff Inservice
- = Rescheduled days for emergency closings as per the list on this calendar. If needed, rescheduled days could extend until June 30.
- = No School: Emergency Closing

Rescheduled student days for use in the event of emergency closings.

- Day 1 ————— June 14, 2023
- Day 2 ————— FID (Dec. 23, 2022)
- Day 3-6 ————— FIDs
- Day 7 ————— June 15, 2023
- Day 8 ————— June 16, 2023
- Day 9 ————— June 20, 2023
- Day 10 ————— June 21, 2023

Section 15-1502(a) Local Holidays—No School

Defined by the PA School Code as days that will not be used as make up for emergency closings.

APPENDIX E

*Trip Generation, Background Growth
& Other Developments*

Land Use: 215

Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 22

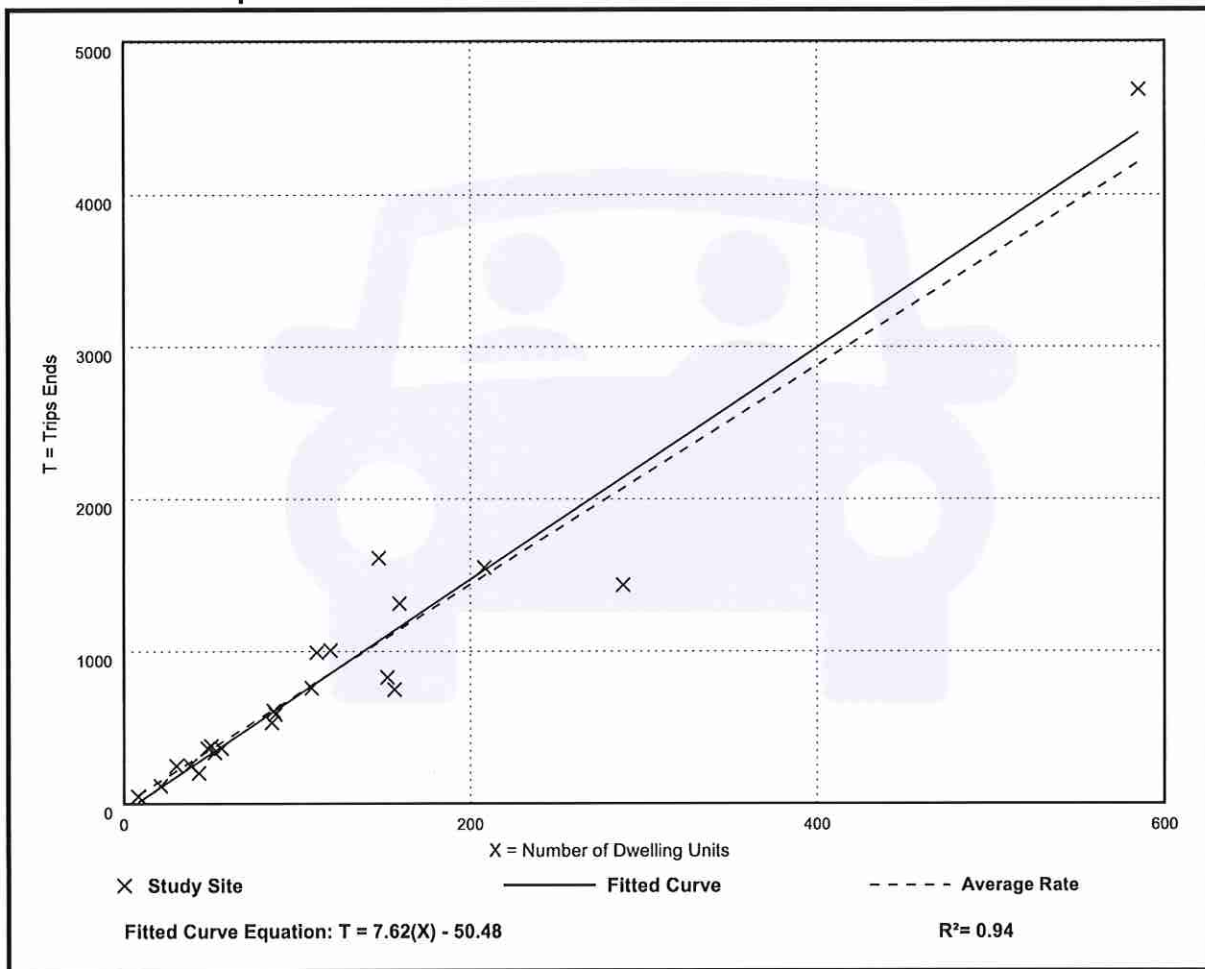
Avg. Num. of Dwelling Units: 120

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 46

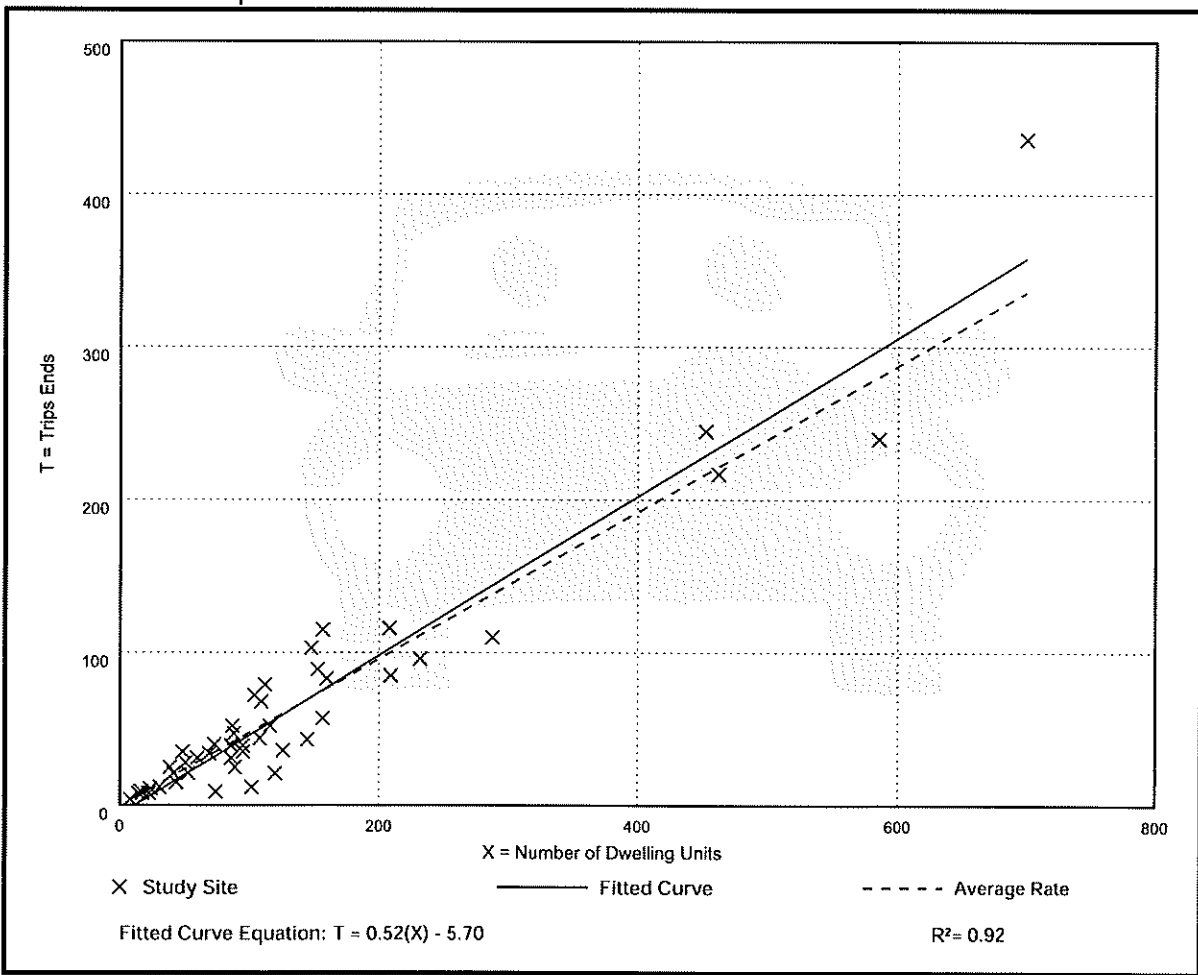
Avg. Num. of Dwelling Units: 135

Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 51

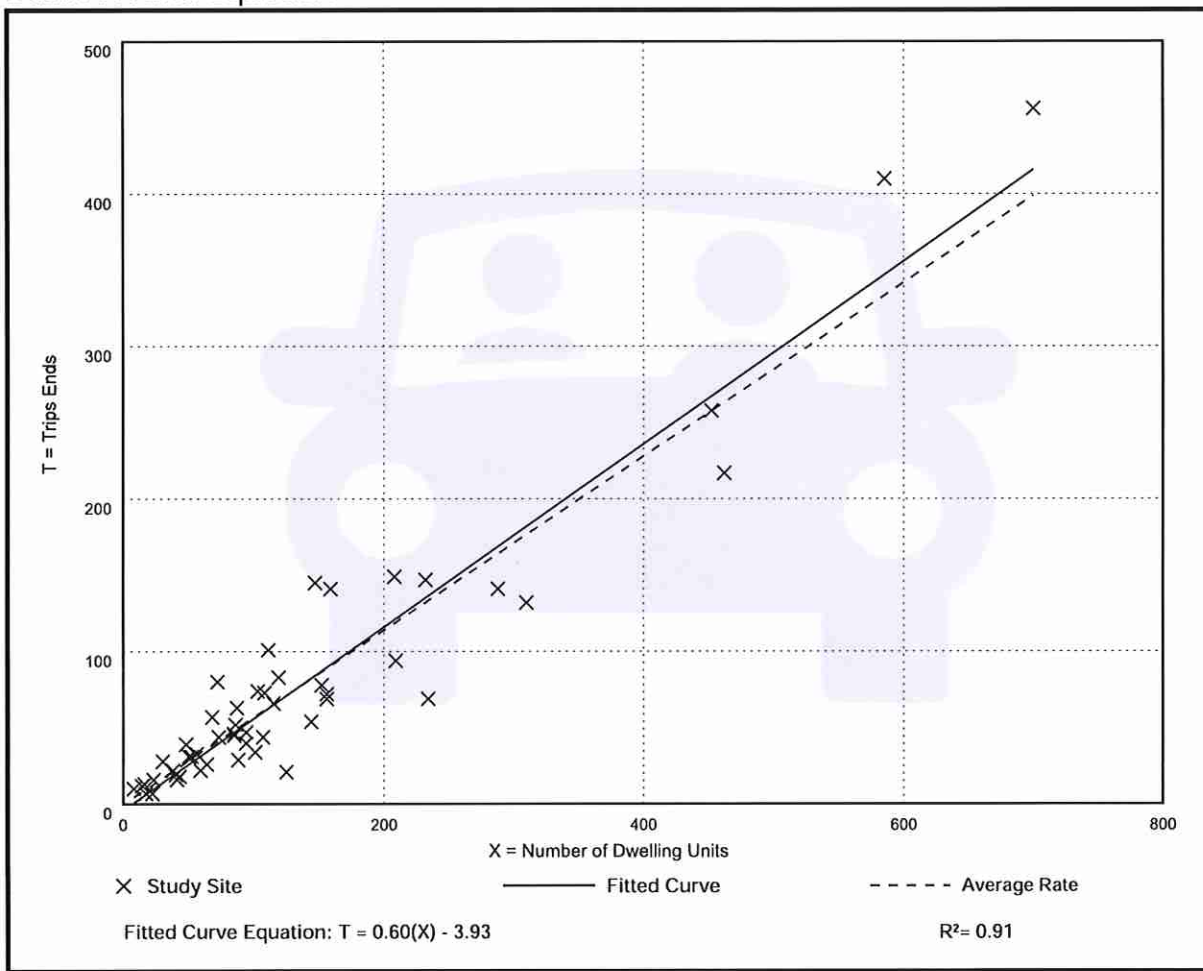
Avg. Num. of Dwelling Units: 136

Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing (215)

Walk+Bike+Transit Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 7

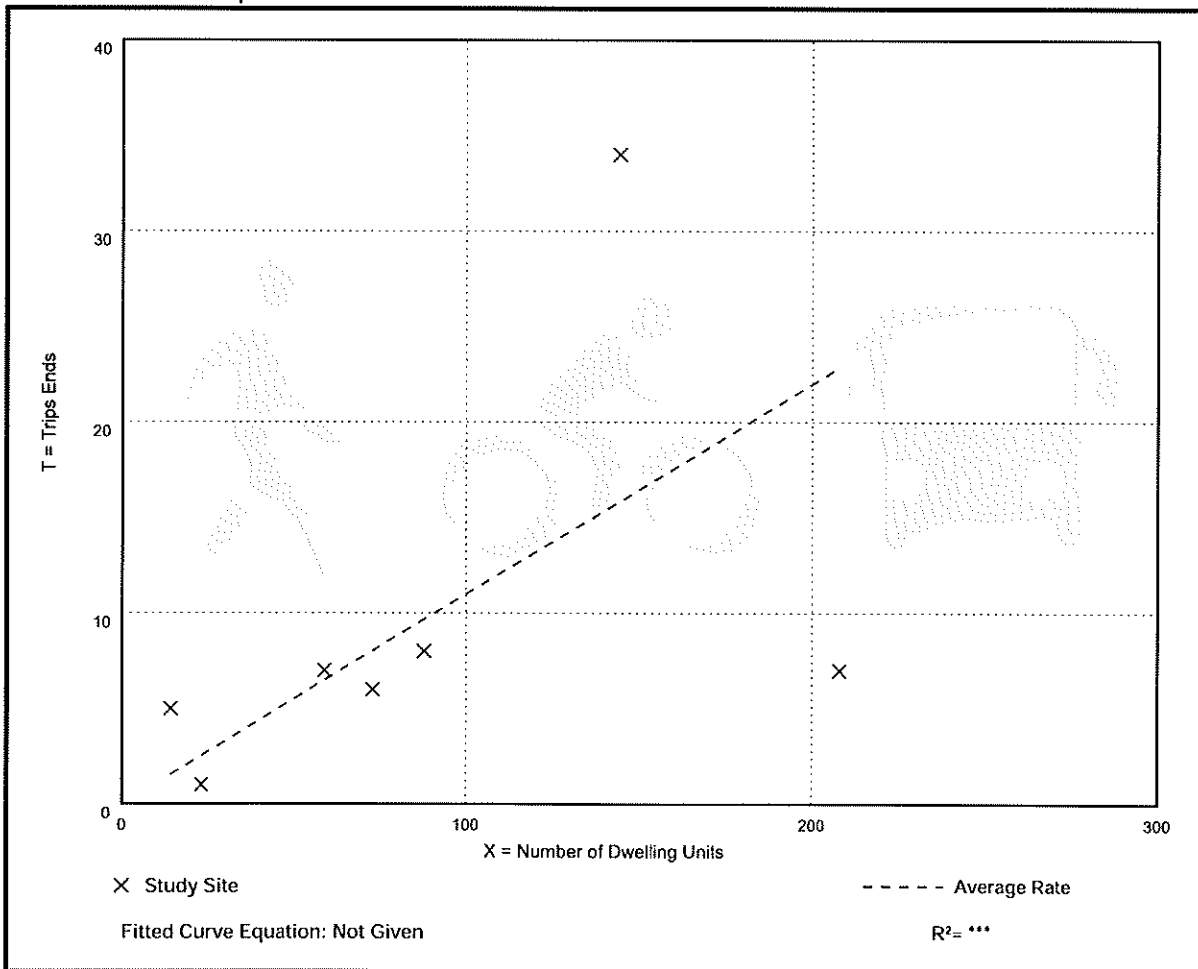
Avg. Num. of Dwelling Units: 87

Directional Distribution: 75% entering, 25% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.11	0.03 - 0.36	0.09

Data Plot and Equation



Single-Family Attached Housing (215)

Walk+Bike+Transit Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 7

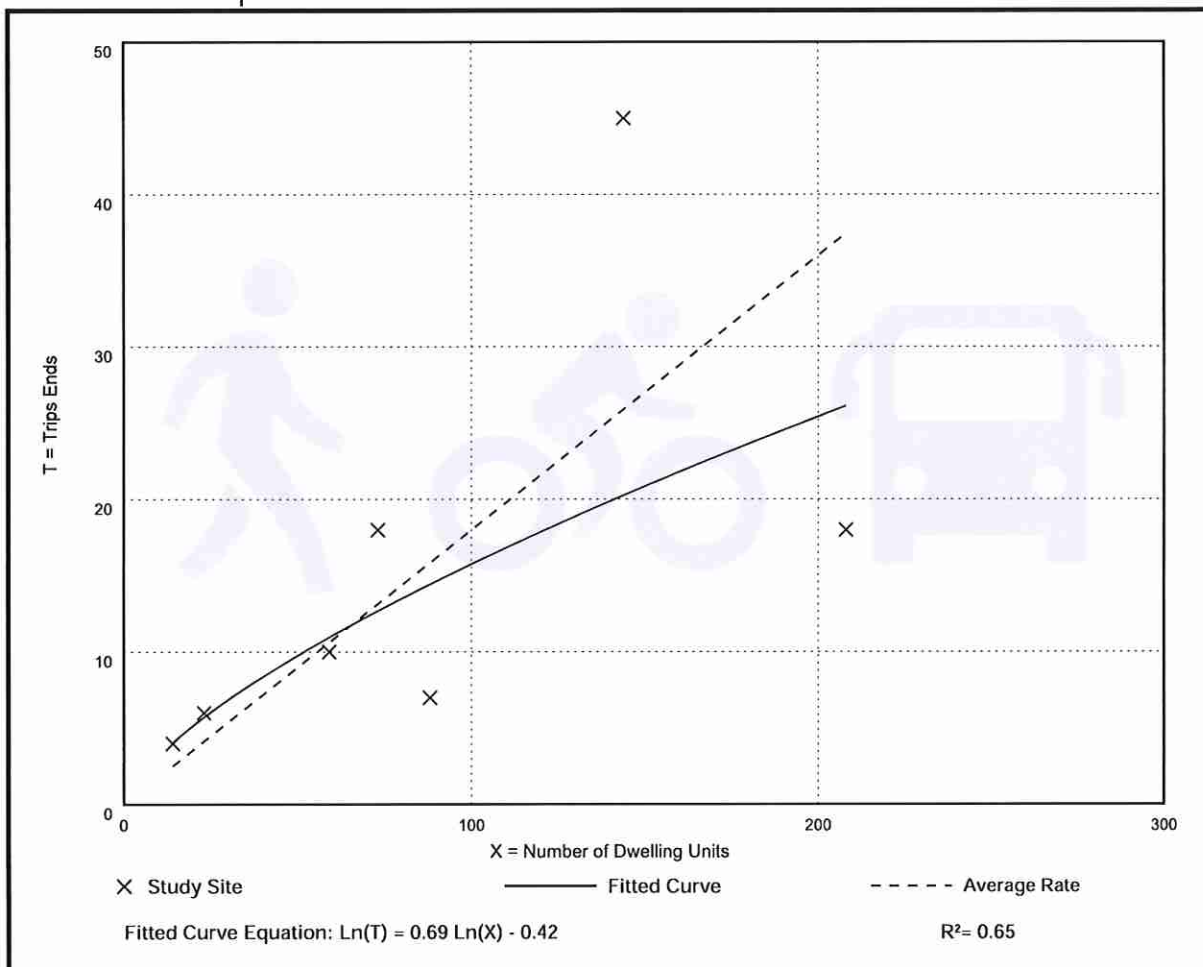
Avg. Num. of Dwelling Units: 87

Directional Distribution: 38% entering, 62% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.18	0.08 - 0.31	0.11

Data Plot and Equation



Growth Factors for August 2022 to July 2023

County	Urban Interstate	Rural Interstate	Urban Non-Interstate	Rural Non-Interstate
ADAMS	*	*	0.50	0.60
ALLEGHENY	0.98	*	0.00	0.43
ARMSTRONG	0.80	*	0.00	0.37
BEAVER	0.64	2.05	0.00	0.30
BEDFORD	*	2.20	0.00	0.39
BERKS	1.34	2.53	0.32	0.58
BLAIR	0.86	2.34	0.00	0.40
BRADFORD	1.06	*	0.00	0.48
BUCKS	1.35	2.63	0.22	0.58
BUTLER	1.66	2.88	0.29	0.71
CAMBRIA	0.35	*	0.00	0.19
CAMERON	*	*	*	0.12
CARBON	1.42	2.68	0.28	0.60
CENTRE	1.79	2.75	0.72	0.74
CHESTER	1.77	2.92	0.54	0.77
CLARION	0.79	2.23	0.00	0.37
CLEARFIELD	0.61	1.94	0.00	0.31
CLINTON	1.10	2.36	0.02	0.48
COLUMBIA	1.10	2.32	0.06	0.48
CRAWFORD	0.74	2.12	0.00	0.36
CUMBERLAND	1.63	2.79	0.59	0.69
DAUPHIN	1.54	*	0.35	0.66
DELAWARE	1.27	*	0.00	*
ELK	*	*	0.00	0.30
ERIE	0.96	2.31	0.00	0.43
FAYETTE	0.86	*	0.00	0.39
FOREST	*	*	*	0.96
FRANKLIN	1.71	2.81	0.73	0.72
FULTON	*	2.33	*	0.50
GREENE	0.73	2.28	0.00	0.36
HUNTINGDON	*	2.49	0.00	0.49
INDIANA	0.94	*	0.00	0.44
JEFFERSON	*	2.32	0.00	0.46
JUNIATA	*	*	*	0.53
LACKAWANNA	0.99	2.36	0.00	0.44
LANCASTER	1.66	2.84	0.60	0.70
LAWRENCE	0.69	2.18	0.00	0.33
LEBANON	*	2.55	0.48	0.62
LEHIGH	1.75	3.09	0.53	0.75
LUZERNE	1.04	2.41	0.00	0.47
LYCOMING	0.99	2.37	0.00	0.44
MCKEAN	0.60	*	0.00	0.30
MERCER	0.92	2.52	0.00	0.43
MIFFLIN	1.17	*	0.00	0.51
MONROE	1.77	2.88	0.79	0.75
MONTGOMERY	1.29	*	0.27	0.55
MONTOUR	1.30	2.68	0.00	0.57
NORTHAMPTON	1.80	3.16	0.47	0.78
NORTHUMBERLAND	1.00	2.28	0.00	0.43
PERRY	*	*	0.24	0.54
PHILADELPHIA	1.18	*	0.05	*
PIKE	1.72	2.72	0.86	0.73
POTTER	*	*	*	0.35
SCHUYLKILL	1.00	2.45	0.00	0.45
SNYDER	1.23	*	0.21	0.54
SOMERSET	0.60	2.06	0.00	0.34
SULLIVAN	*	*	*	0.37
SUSQUEHANNA	1.09	2.43	0.00	0.47
TIOGA	*	*	*	0.42
UNION	1.54	2.68	0.44	0.63
VENANGO	*	1.91	0.00	0.27
WARREN	*	*	0.00	0.35
WASHINGTON	1.22	2.74	0.00	0.55
WAYNE	*	2.53	0.31	0.58
WESTMORELAND	0.89	2.18	0.00	0.40
WYOMING	*	*	0.00	0.44
YORK	1.57	2.89	0.47	0.69

* = Functional Class Doesn't Exist in County

Questions? Please contact Andrew O'Neill at the Bureau of Planning and Research, 717-346-3250 or andoneill@pa.gov

NOTE: The projected growth factors are derived using historical VMT (Vehicle Miles Traveled) data (1994 to 2021), as well as Woods and Poole demographic and economic data. The factors should be compounded when calculating future values. The factors should not be used to project traffic beyond a 20-year period. Please be aware that these factors are estimates, and unforeseen events (opening of shopping centers, fast food franchises, gas stations, etc) could cause growth to change over time.



14 September 2022

Cas Holloway, III
C.F. Holloway, III & Company
110 Gallagher Road
Wayne, PA 19087

VIA EMAIL ONLY

**RE: Traffic Engineering Investigations of
St. Honoré (Eagle Road) 14-unit SFDU Site
Radnor Township, Delaware County, PA**
FTA Job #219-011

Mr. Holloway:

F. Tavani and Associates, Inc. (FTA) has conducted traffic engineering investigations for the above-referenced project in Strafford. As you know, FTA formerly studied this site for Haverford Properties in 2020. At that time, a 9-unit development was proposed, and a report was prepared in accordance with Radnor code requirements and followed the recommended outline as identified in said ordinance. The site now contains 14 units and FTA has updated the 2020 report to reflect this change, per our discussions.

GENERAL SITE DESCRIPTION

This study considers the traffic impact of a proposed single family detached community of 14 units. The housing is proposed to be for sale and will feature a mix of mainly 4 and 5 bedrooms. The housing is proposed to be market-rate and not age-restricted. The process of entitlements, construction, and occupancy is expected to take 2-3 years. The site is immediately surrounded by other residential properties and, beyond them, there is a mix of office and retail buildings within a 1 mile radius of the site. Ample mass transit opportunities are also within a short distance of the site.

The site was previously contemplated as 9 units, all of which were proposed to access a new cul-de-sac whose driveway would intersect Eagle Road just north of Strafford Avenue. Additional lots abutting the site have been acquired and are proposed to be redeveloped. One acquired lot is the former Wayne Bed and Breakfast property – a site containing a 7-bedroom B&B building plus a free-standing garage with 1-unit apartment building to the rear of the site. More details about the trip generation implications and proposed access of these acquired lots is presented later.

The site is located on the east side of Strafford Avenue, north of Eagle Road and is known as the Hamilton Estate. Much of the site is presently undeveloped land.

The site location and surrounding area are presented in figures which are attached to the end of this report, namely **Figure 1** and **Figure 2**. A reduced version of a recent site plan for the project is presented as **Figure 3**. There are no other known approved land development projects in the vicinity of the site.

Note that technical appendices are provided following the figures. **Appendix A** contains some recent project correspondence. Photodocumentation of the study area is provided in **Appendix B**.

TRANSPORTATION FACILITIES DESCRIPTION

The site has frontage on Eagle Road and Strafford Avenue, both existing, two-way, one-lane-per-direction, public roadways. The roadways generally do not feature on-street public parking. Posted speed limit signs are present in the vicinity of the site along both Strafford Avenue and Eagle Road, where the posted speed limit is 25 mph. There are limited sidewalk facilities in the study area. The major intersections closest to the site are all-way stop-controlled intersections with no painted crosswalks. There are existing SEPTA mass transit opportunities near the site including bus route 106 and a regional rail station (Strafford), each of which are within approximately one half mile of the site. No traffic signals (save for a flashing beacon at the all-way stop-controlled intersection of Strafford Avenue and Eagle Road) exist or are proposed in the immediate vicinity of the site. More site driveway and surrounding intersection details can be seen in photodocumentation log as provided in **Appendix B**.

The site has 10 units which are proposed to take access to Eagle Road via a proposed new cul-de-sac. Previously, 9 units were proposed to access the cul-de-sac. As seen in **Figure 3**, the proposed 10th unit to access the cul-de-sac is annotated with an asterisk. Additionally, recently-acquired lots along Stafford Avenue permit the construction of 4 additional lots all of which will have driveways proposed along Stafford Avenue, similar to existing driveways found on the recently-acquired lots.

The units will feature garage/driveway parking plus undefined visitor parking along the cul-de-sac. Sidewalks are also proposed.

There are no known planned roadway improvements in the vicinity of the site. None of the streets surrounding the site are “SR”s (state roadways) – instead they are all local roadways. Eagle Road is a “G” roadway, meaning it is not an SR but is eligible for liquid fuels funding and PennDOT does maintain traffic count data along it, as seen in **Appendix C**.

EXISTING TRAFFIC CONDITIONS

FTA conducted traffic counts at the intersections of:

- Strafford Avenue and Eagle Road,
- Strafford Avenue and Grant Lane/Hedgerow Lane, and
- Eagle Road and N Wayne Avenue.

The counts were conducted on Thursday, 16 May 2019 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. The counts were conducted during the school year, in fair weather, and on a typical weekday. Existing peak hours of 8:00 AM to 9:00 AM and 4:30 PM to 5:30 PM were selected for study based on a system-wide peak hour investigation. The corresponding existing peak hour traffic volumes are plotted and seen in **Figure 4**. Raw traffic volumes are attached in **Appendix D**, as is a spreadsheet which describes the system peak investigation. Note that the data collection was conducted pre-Covid.

With existing peak hour volumes established, present-day “levels of service” can be assessed. Level of service (or LOS) is a descriptive mechanism which is employed by traffic engineers to relate quality of traffic flow to both a letter grade and estimate of delay in seconds per vehicle. LOS results are assessed for traffic which must stop or yield to other traffic. Free-flowing traffic theoretically has no delay, and therefore no LOS rating. Existing levels of service were determined using *Synchro version 11* software, with HCS 6th edition-format outputs selecting for performance-reporting purposes. A **LOS Comparison Matrix** was prepared and is attached to the end of this report. The matrix summarizes AM and PM peak hour performance for existing and future (see next section) conditions for all intersections. As shown,

existing levels of service are all LOS A and B, with all calculated delays being very low (10 seconds or less in most cases – an acceptable condition). No congestion locations (LOS E/F) are noted.

TRANSPORTATION IMPACT OF THE DEVELOPMENT

Site traffic was estimated using the Institute of Transportation Engineers (ITE) publication, Trip Generation, 11th edition. ITE website trip generation outputs are attached and provided in **Appendix E**. Raw trip generation could have been modified to reflect how this site is located in a setting which is within walking distance of several businesses as well as SEPTA bus route 106 plus the Strafford train station, though **no such multimodal credits were taken**. Instead, *all* site traffic was assigned (trip distributed) to the surrounding roadway network in accordance with existing traffic patterns as well as an understanding of existing road network connectivity, current traffic/congestion patterns, and relative locations of major highway interchanges (Interstates 476, 76, 202, and 422 as well as Business Route 30). The assignments are summarized as follows:

- 30% to/from Routes 202 & 422 via Strafford Ave to Old Eagle School Rd;
- 30% to/from Routes 476 & 76 via Eagle Rd to King of Prussia Rd;
- 15% to/from Business Rt 30 West via Eagle Rd and Strafford Ave;
- 15% to/from Business Rt 30 East via Eagle Rd and Strafford Ave, West Ave., and/or Banbury Way; &
- 10% to/from Conestoga Road via Eagle Road.

The trip distribution model for the community is shown in **Figure 5** and the resultant assignment of new, site-generated, vehicular peak hour traffic is shown in **Figure 6**. The trip generation summary table found in the earlier version of this report (for the former 9-unit plan) follows below:

**TABLE 1
 PROJECTED VEHICULAR TRIP GENERATION¹ – 9 SFDUs**

AM PEAK HOUR			PM PEAK HOUR		
<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
3	8	11	6	4	10

Average daily site traffic was calculated and determined to be approximately 113 trips for the previously-proposed 9-unit site. These numbers of course increase for a 14-unit development. **Table 2** summarizes trip generation for the currently-proposed 14-unit plan:

**TABLE 2
 PROJECTED VEHICULAR TRIP GENERATION² – 14 SFDUs**

AM PEAK HOUR			PM PEAK HOUR		
<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
3	9	12	10	6	16

Average daily site traffic was calculated and determined to be approximately 165 trips for the proposed 14-unit site. Note that in all cases no credits were taken for the trip generation associated with the 1 single family home and the 7-bedroom bed and breakfast site (plus apartment) which are located along Strafford

¹ As presented in 2020 report, based on ITE Trip Generation Manual, 10th edition
² Based on ITE Trip Generation Manual, 11th edition

Avenue and have since been added to the development as shown in **Figure 3**. Taking a credit (reduction) for these existing buildings is appropriate and ordinarily would have been done, but – in an abundance of conservativeness – *no* credits were taken, and instead the trip generation summarized in **Table 2** was distributed throughout the road network for analysis. See **Appendix E** for more details.

ANALYSIS OF TRANSPORTATION IMPACT

Future traffic conditions are a function of three components: (1) existing traffic volumes, (2) additional traffic due to general background growth as well as other known approved developments in the immediate proximity of the site, and (3) site traffic.

As mentioned earlier, there are no other known approved land development projects in the vicinity of the site. Regarding background growth, the currently promulgated background growth rate for Delaware County is 0.00% per year as reported by PennDOT. This means that future ‘no build’ traffic volumes and levels of service are identical to existing traffic volumes and levels of service.

The projected future ‘build’ (no build plus site traffic) peak hour volumes are shown in **Figure 7**. The related projected levels of service are once shown in **LOS Comparison Matrix**. As shown projected ‘build’ levels of service once again remain essentially the same as they are today, and are all LOS B or better. Note that the proposed individual new driveways along Strafford Road were modeled as if their combined activity took place at one hypothetical driveway, effectively quadrupling the activity / impact at one location, which is the most conservative way the driveway could be analyzed. It is important to emphasize again that the analysis also took no credits for multi-modalism or for the existing single family home and the existing 7-bedroom bed and breakfast (plus apartment) sites along Strafford Avenue. Even with this conservative approach, no congestion locations (LOS E/F) are noted and in fact the impact of site traffic is no added delay at all intersections/turning movements (i.e., the impact of site traffic never amounts to *any* added delay at *any* impacted turning movement),

No road improvements are necessary to offset the impact of added site traffic. The proposed site driveways will not feature traffic volumes which warrant the installation of a traffic signal. The acceptable operation of the site driveways (LOS A and B) in unsignalized state underscores this conclusion. Level of service worksheets are provided in **Appendix F**.

AUXILIARY LANE ANALYSIS

The need for new auxiliary left- and right-turn lanes at the site driveway was investigated. Investigations were based on PennDOT Strike Off Letter 560-08-4 as well as PennDOT *Publication 46* Chapter 11 page 11-46 (“Turn Lane Warrants”) using PennDOT-provided worksheets, and focusing on the highest (busiest) peak hour for entering traffic. Investigations conclude that new auxiliary left- and right-turn lanes are not warranted at the cul-de-sac intersection with Eagle Road or at the proposed driveways along Strafford Avenue, and this, again, is the case even while taking no credits for multi-modalism or for the existing single family home and the existing 7-bedroom bed and breakfast (plus apartment) sites. More details are provided in **Appendix G**.

CONCLUSIONS

As mentioned earlier, a **LOS Comparison Matrix** is provided to afford a simple means to review and assess site traffic impact in the study area. In locations where levels of service are not forecasted to change from one scenario to the next (i.e., from Existing to No Build, or from No Build to Build), hyphens are used. As shown, there are many instances in which the impact of site traffic results in

essentially no measurable change in traffic performance and the underlying traffic performance is already acceptable, and with very low delays.

Other key conclusions are as follows:

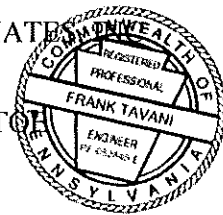
- The study area is presently well-served by transit opportunities.
- There are no streets or intersections operating below LOS C under existing or future conditions.
- The site driveways are forecasted to operate at LOS A/B during both peak hours, and for all turning movements.
- The site driveways do not require new left-turn or right-turn auxiliary lanes per investigations using standard PennDOT tools.
- The foregoing conclusions were reached taking no credits for:
 - walking,
 - transit usage, or
 - the existing single family home and the existing 7-bedroom bed and breakfast (plus apartment) sites along Strafford Avenue.

In closing it is important to again emphasize that the only change between what Haverford Properties had proposed previously and what is proposed now is a net increase of 3 new homes – 1 additional home on the cul-de-sac and 2 net new homes on Strafford Avenue. Because of this, and as expected, the findings and conclusions of this report are not meaningfully different from the earlier report.

I hope this has been helpful. Please let me know if I can answer any questions.

Thank you,
F. TAVANI AND ASSOCIATES


FRANK TAVANI, P.E., PTOA
Principal



attachments

cc: Mike Bowker, P.E.

LEVEL OF SERVICE COMPARISON TABLES

1. Strafford Ave & Grant Ln / Hedgerow Ln							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Strafford Ave		Existing (2019)	No Build (2024)	Build (2024)	Existing (2019)	No Build (2024)	Build (2024)
Eastbound	LTR	A 8	--	--	A 9	--	--
Westbound	LTR	A 9	--	--	A 8	--	--
Grant Ln / Hedgerow Ln							
Northbound	LTR	A 8	--	--	A 7	--	--
Southbound	LTR	A 8	--	--	A 7	--	--
OVERALL:		A 9	--	--	A 9	--	--

Control Type: AWSC

2. Strafford Ave & Eagle Ave							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Strafford Ave		Existing (2019)	No Build (2024)	Build (2024)	Existing (2019)	No Build (2024)	Build (2024)
Eastbound	LTR	A 10	--	--	B 11	--	--
Westbound	LTR	A 9	--	--	B 10	--	--
Eagle Ave							
Northbound	LTR	A 9	--	--	B 11	--	--
Southbound	LTR	A 10	--	--	B 11	--	--
OVERALL:		A 9	--	--	B 11	--	--

Control Type: AWSC

3. N Wayne Ave & Eagle Ave							
Direction	Movement	AM Peak Hour			PM Peak Hour		
N Wayne Ave		Existing (2019)	No Build (2024)	Build (2024)	Existing (2019)	No Build (2024)	Build (2024)
Eastbound	LTR	A 4	--	--	A 5	--	--
Westbound	LTR	A 3	--	--	A 5	--	--
Eagle Ave							
Northbound	LTR	B 20	--	--	B 20	--	--
Southbound	LTR	B 19	--	--	B 20	--	--
OVERALL:		A 8	--	--	B 10	--	--

Control Type: Signal

4. Eagle Ave & Site Drive							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Site Drive		Existing (2019)	No Build (2024)	Build (2024)	Existing (2019)	No Build (2024)	Build (2024)
Eastbound	LR			A 10			B 11
Eagle Ave							
Southbound	L			A 8			A 8
OVERALL:				A 1			A 1

Control Type: TWSC

5. Strafford Ave & Site Drive							
Direction	Movement	AM Peak Hour			PM Peak Hour		
Site Drive		Existing (2019)	No Build (2024)	Build (2024)	Existing (2019)	No Build (2024)	Build (2024)
Southbound	LR			B 10			B 10
Strafford Ave							
Eastbound	L			A 8			A 8
OVERALL:				A 1			A 1

Control Type: TWSC

Future No Build volumes are identical to Existing volumes, so LOS are also identical

-- indicates no change from the previous scenario

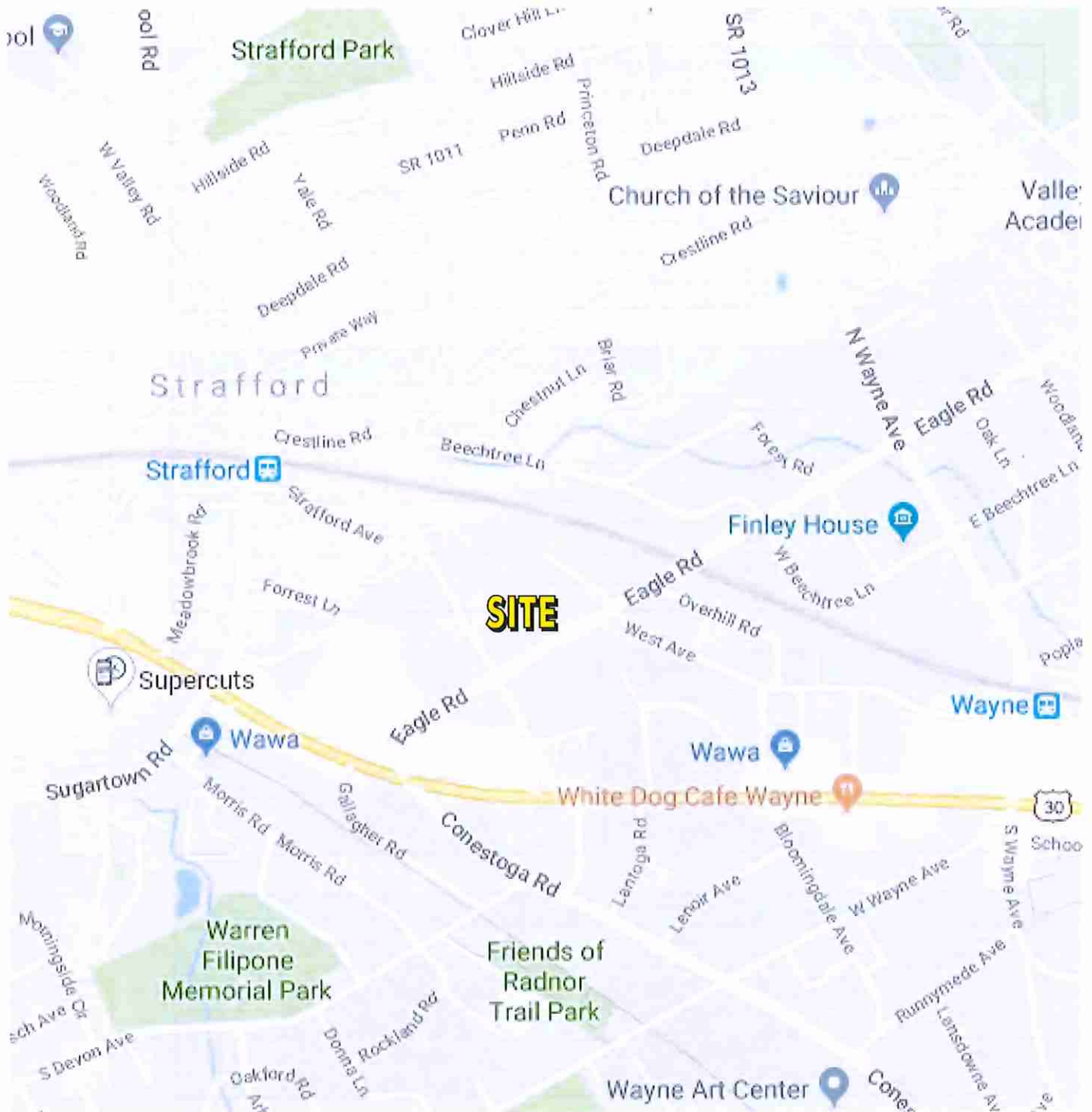


Site and Surrounding Area – Map View

**Strafford Avenue Residential - SFDUs
Radnor Township,
Delaware County, Pennsylvania**



September 2022*



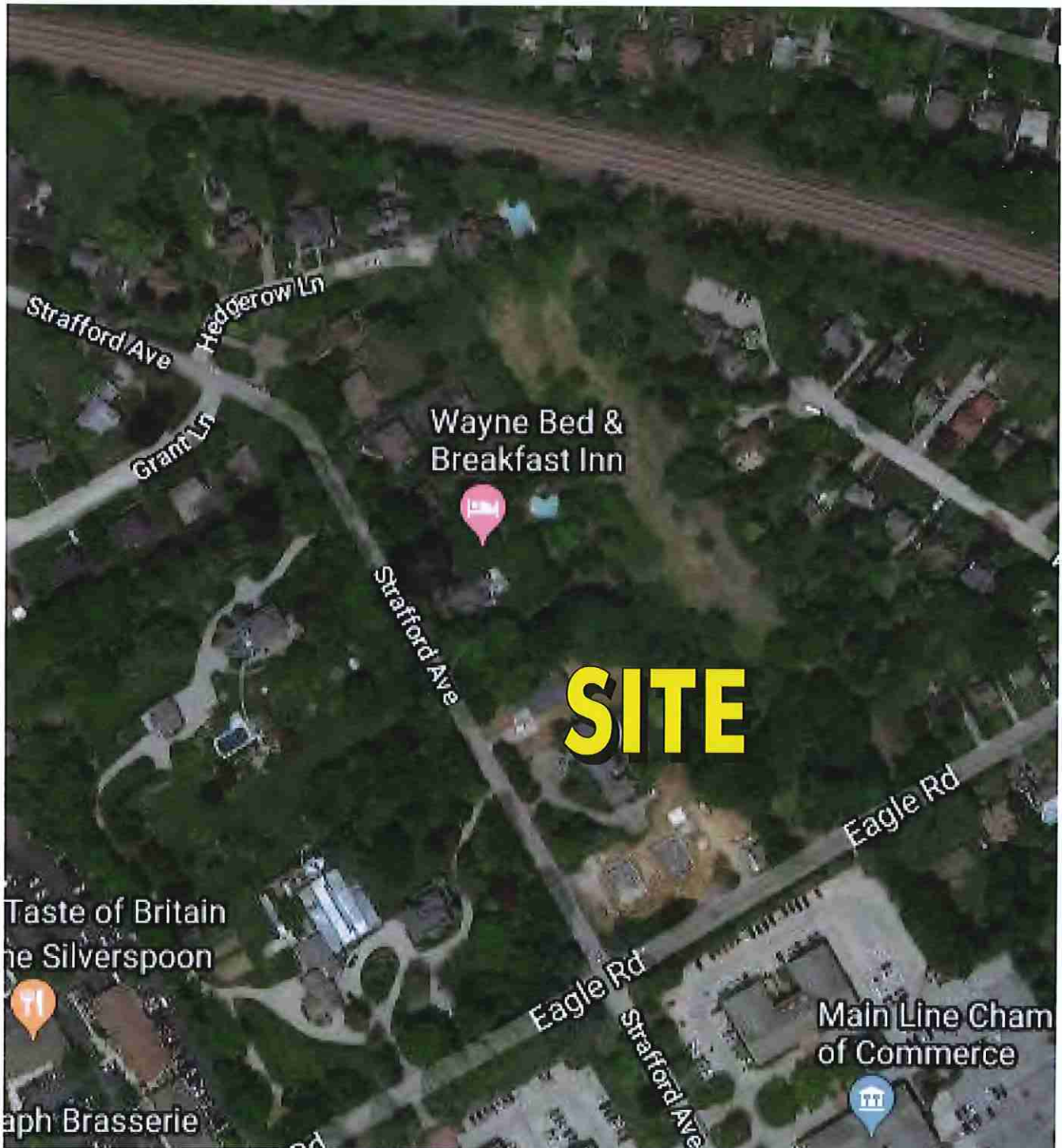
* Figure preparation date. See report for data collection date(s).

Site and Surrounding Area – Aerial View

Strafford Avenue Residential - SFDUs
Radnor Township,
Delaware County, Pennsylvania



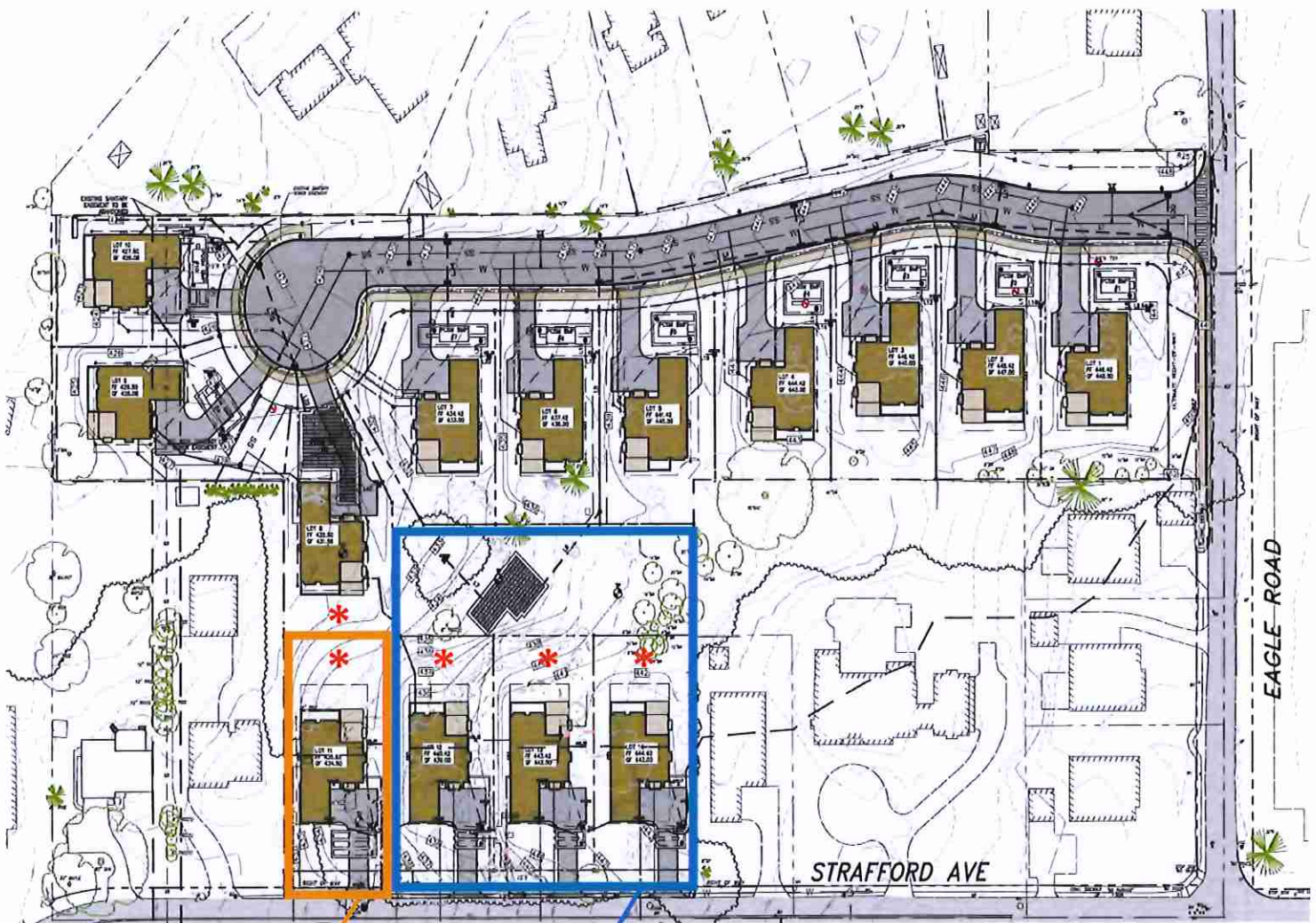
September 2022



Site Plan Excerpt

Strafford Avenue Residential - SFDUs
Radnor Township,
Delaware County, Pennsylvania

September 2022



Existing 1 SFDU site

Existing 7-bed + 1 apt Bed & Breakfast site

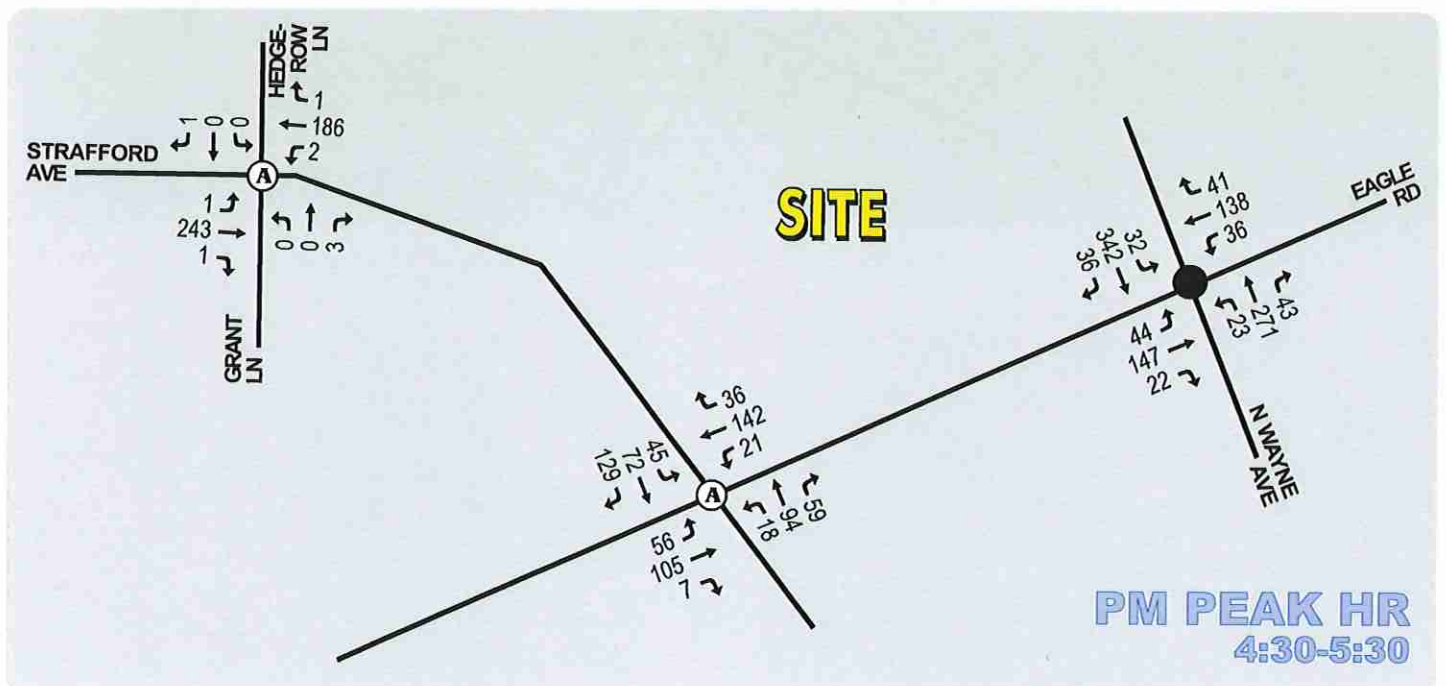
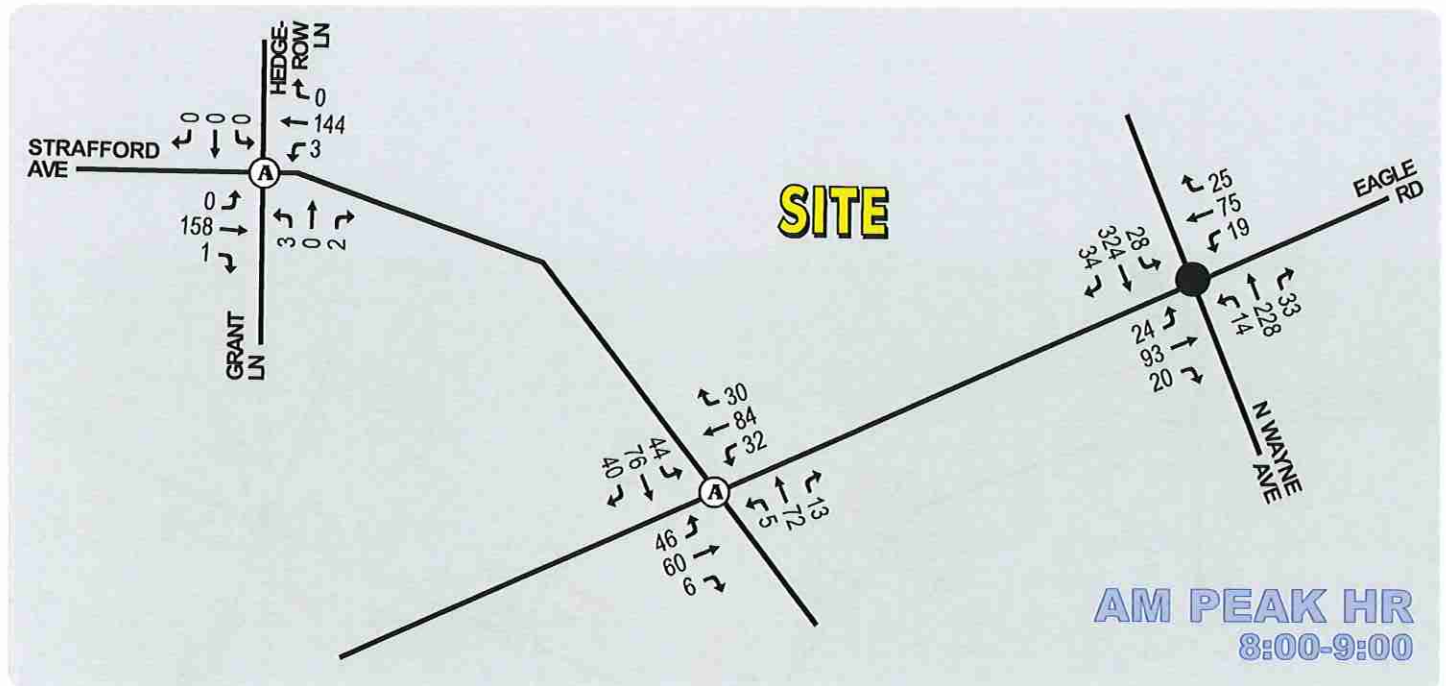
* Units added since last traffic study

Existing (2019) Peak Hour Traffic Volumes

Strafford Avenue Residential - SFDUs
Radnor Township,
Delaware County, Pennsylvania



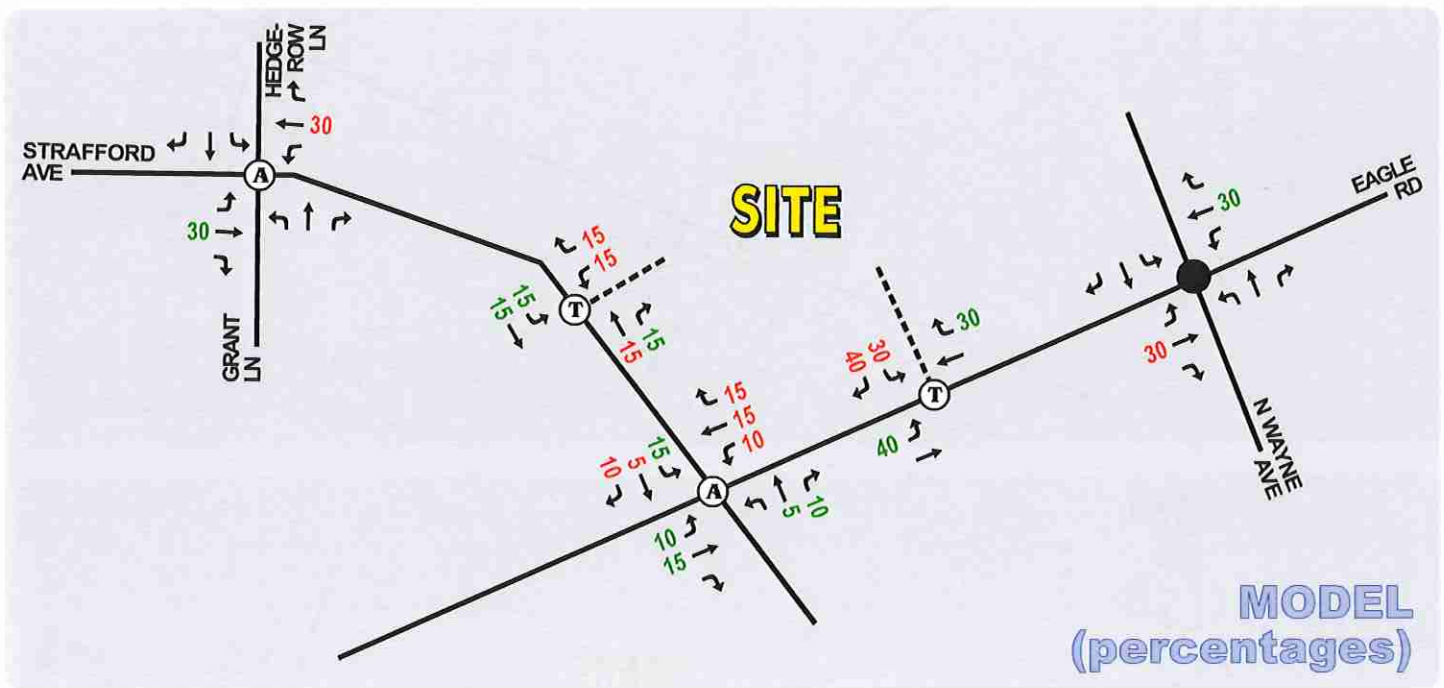
September 2022



Site Peak Hour Traffic – Model

Strafford Avenue Residential - SFDUs
 Radnor Township,
 Delaware County, Pennsylvania

September 2022



MODEL
(percentages)



Signalized Intersection



Unsignalized Intersection,
All-Way Stop Control



Unsignalized Intersection,
Two-Way Stop Control (Side Street Only)

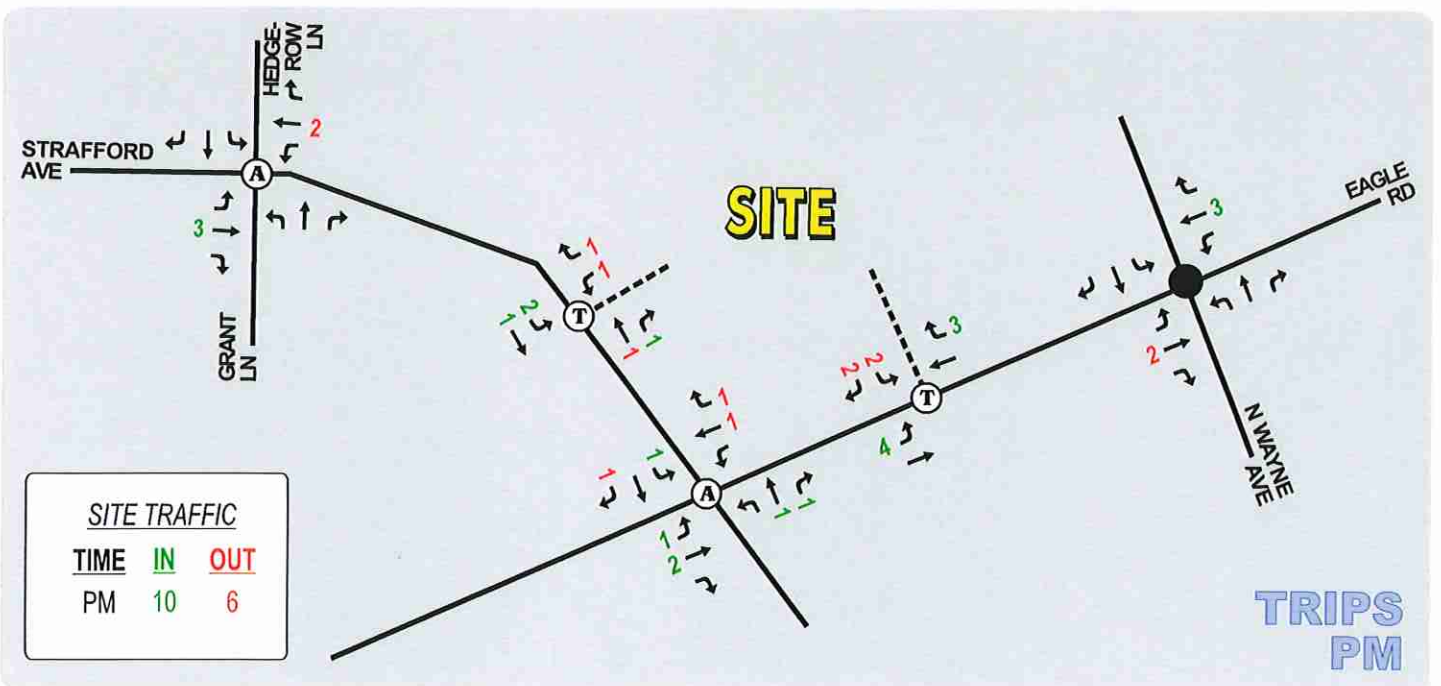
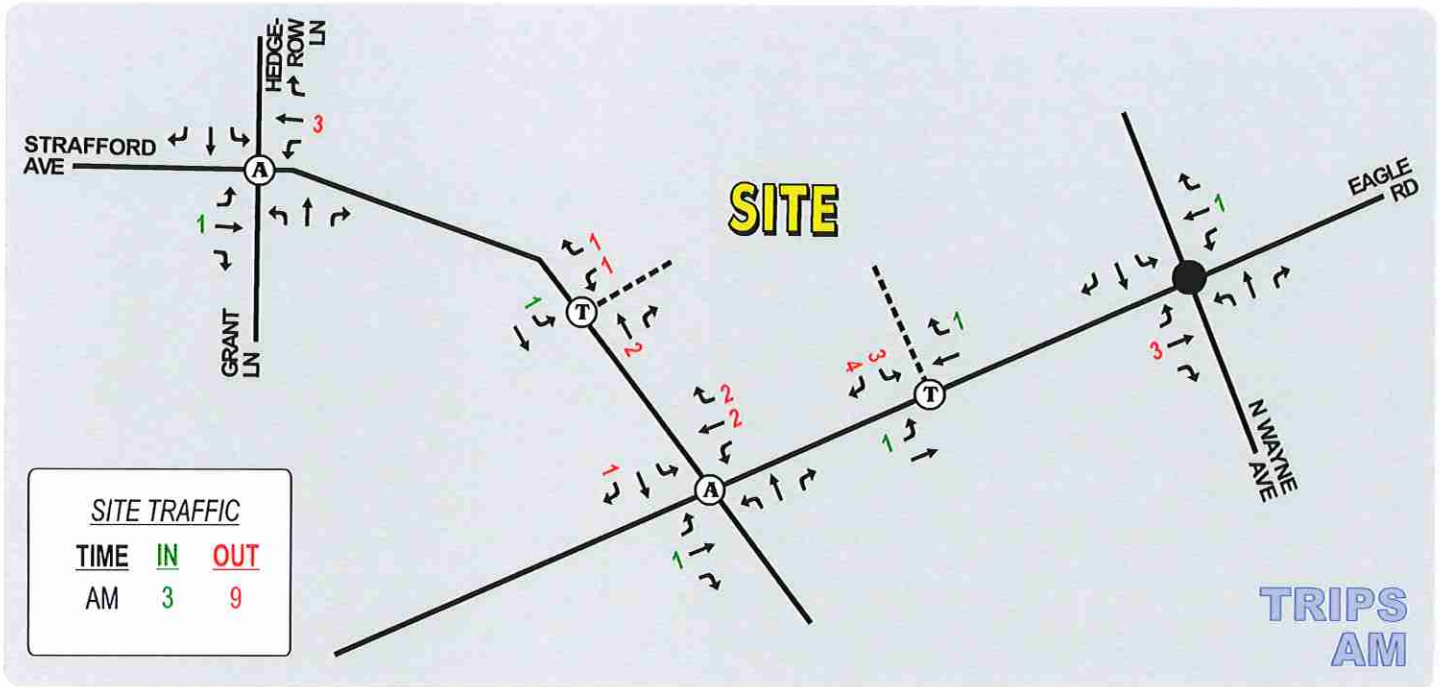
INBOUND
OUTBOUND

Site Peak Hour Traffic – Volumes

Strafford Avenue Residential - SFDUs
Radnor Township,
Delaware County, Pennsylvania



September 2022



APPENDIX F

Capacity Analyses

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	86	25	20	87	17	19	160	14	25	333	36
Future Volume (vph)	12	86	25	20	87	17	19	160	14	25	333	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	14	14	14	16	16	16	11	11	11
Grade (%)		-2%			-1%			0%			-5%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.973			0.982			0.990			0.988	
Fl _t Protected		0.995			0.992			0.995			0.997	
Satd. Flow (prot)	0	1690	0	0	1782	0	0	1977	0	0	1695	0
Fl _t Permitted		0.968			0.947			0.952			0.978	
Satd. Flow (perm)	0	1644	0	0	1701	0	0	1891	0	0	1663	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					14			10			12	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2785			863			613			617	
Travel Time (s)		76.0			23.5			16.7			16.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	20%	2%	6%	0%	2%	0%	4%	4%	0%
Adj. Flow (vph)	13	93	27	22	95	18	21	174	15	27	362	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	135	0	0	210	0	0	428	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	0.98	0.98	0.98	0.91	0.91	0.91	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	40		20	40		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	40		20	40		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023

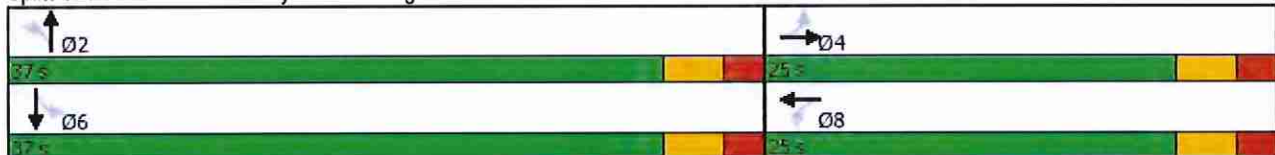


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		37.0	37.0		37.0	37.0	
Total Split (%)	40.3%	40.3%		40.3%	40.3%		59.7%	59.7%		59.7%	59.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		10.4			10.4			36.9			36.9	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.41			0.39			0.16			0.36	
Control Delay		21.6			19.2			4.3			5.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.6			19.2			4.3			5.7	
LOS		C			B			A			A	
Approach Delay		21.6			19.2			4.3			5.7	
Approach LOS		C			B			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	62
Actuated Cycle Length:	52.3
Natural Cycle:	40
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	9.7
Intersection Capacity Utilization:	44.5%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	A

















Splits and Phases: 1: N Wayne Ave & Eagle Rd



HCM 6th Signalized Intersection Summary

















1: N Wayne Ave & Eagle Rd

05/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	86	25	20	87	17	19	160	14	25	333	36
Future Volume (veh/h)	12	86	25	20	87	17	19	160	14	25	333	36
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	1875	1860	1875	1615	1881	1822	1872	1843	1872	1929	1929	1986
Adj Flow Rate, veh/h	13	93	27	22	95	18	21	174	15	27	362	39
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	1	0	20	2	6	0	2	0	4	4	0
Cap, veh/h	98	179	49	115	185	33	146	1059	86	115	1148	118
Arrive On Green	0.12	0.14	0.12	0.12	0.14	0.12	0.67	0.70	0.67	0.67	0.70	0.67
Sat Flow, veh/h	106	1310	361	200	1355	239	91	1524	124	49	1651	170
Grp Volume(v), veh/h	133	0	0	135	0	0	210	0	0	428	0	0
Grp Sat Flow(s),veh/h/ln	1777	0	0	1795	0	0	1739	0	0	1871	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.3	0.0	0.0	3.3	0.0	0.0	1.9	0.0	0.0	4.3	0.0	0.0
Prop In Lane	0.10		0.20	0.16		0.13	0.10		0.07	0.06		0.09
Lane Grp Cap(c), veh/h	288	0	0	295	0	0	1255	0	0	1342	0	0
V/C Ratio(X)	0.46	0.00	0.00	0.46	0.00	0.00	0.17	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	814	0	0	818	0	0	1255	0	0	1342	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.3	0.0	0.0	19.3	0.0	0.0	2.5	0.0	0.0	2.9	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0	1.1	0.0	0.0	0.3	0.0	0.0	0.6	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	2.5	0.0	0.0	2.5	0.0	0.0	0.9	0.0	0.0	2.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	0.0	20.4	0.0	0.0	2.8	0.0	0.0	3.5	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		133			135			210			428	
Approach Delay, s/veh		20.4			20.4			2.8			3.5	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		10.5		37.0		10.5				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		3.9		5.3		6.3		5.3				
Green Ext Time (p_c), s		1.4		0.3		3.0		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				8.3								
HCM 6th LOS				A								

Lanes, Volumes, Timings
2: Strafford Ave & Eagle Rd

05/11/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	48	8	29	80	21	4	47	20	42	47	33
Future Volume (vph)	33	48	8	29	80	21	4	47	20	42	47	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	13	13	13	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.978			0.962			0.964	
Frt Protected		0.982			0.989			0.997			0.983	
Satd. Flow (prot)	0	1763	0	0	1737	0	0	1883	0	0	1729	0
Frt Permitted		0.982			0.989			0.997			0.983	
Satd. Flow (perm)	0	1763	0	0	1737	0	0	1883	0	0	1729	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		586			2785			417			648	
Travel Time (s)		16.0			76.0			11.4			17.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	0%	3%	0%	10%	0%	0%	0%	5%	2%	6%
Adj. Flow (vph)	36	53	9	32	88	23	4	52	22	46	52	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	143	0	0	78	0	0	134	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 28.2%

ICU Level of Service A

Analysis Period (min) 15

HCM 6th AWSC
2: Strafford Ave & Eagle Rd

05/11/2023

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	33	48	8	29	80	21	4	47	20	42	47	33
Future Vol, veh/h	33	48	8	29	80	21	4	47	20	42	47	33
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	3	0	0	3	0	10	0	0	0	5	2	6
Mvmt Flow	36	53	9	32	88	23	4	52	22	46	52	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.5	8	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	37%	22%	34%
Vol Thru, %	66%	54%	62%	39%
Vol Right, %	28%	9%	16%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	89	130	122
LT Vol	4	33	29	42
Through Vol	47	48	80	47
RT Vol	20	8	21	33
Lane Flow Rate	78	98	143	134
Geometry Grp	1	1	1	1
Degree of Util (X)	0.097	0.126	0.179	0.169
Departure Headway (Hd)	4.461	4.626	4.504	4.542
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	803	775	797	790
Service Time	2.49	2.654	2.53	2.569
HCM Lane V/C Ratio	0.097	0.126	0.179	0.17
HCM Control Delay	8	8.3	8.5	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.4	0.6	0.6

Lanes, Volumes, Timings
 3: Grant Ln/Hedgerow Ln & Strafford Ave

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	122	2	3	101	0	1	1	1	1	0	0
Future Volume (vph)	1	122	2	3	101	0	1	1	1	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	12	12	12	9	9	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.955				
Flt Protected					0.999			0.984			0.950	
Satd. Flow (prot)	0	1764	0	0	1908	0	0	1785	0	0	1624	0
Flt Permitted					0.999			0.984			0.950	
Satd. Flow (perm)	0	1764	0	0	1908	0	0	1785	0	0	1624	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		580			289			323			292	
Travel Time (s)		15.8			7.9			8.8			8.0	
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 (%)	0%	4%	0%	33%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	136	2	3	112	0	1	1	1	1	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	139	0	0	115	0	0	3	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	122	2	3	101	0	1	1	1	1	0	0
Future Vol, veh/h	1	122	2	3	101	0	1	1	1	1	0	0
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, %	0	4	0	33	2	0	0	0	0	0	0	0
Mvmt Flow	1	136	2	3	112	0	1	1	1	1	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	8.4	7.4	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	1%	3%	100%
Vol Thru, %	33%	98%	97%	0%
Vol Right, %	33%	2%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	125	104	1
LT Vol	1	1	3	1
Through Vol	1	122	101	0
RT Vol	1	2	0	0
Lane Flow Rate	3	139	116	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.004	0.154	0.147	0.001
Departure Headway (Hd)	4.341	3.986	4.578	4.679
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	897	783	769
Service Time	2.341	2.024	2.606	2.679
HCM Lane V/C Ratio	0.004	0.155	0.148	0.001
HCM Control Delay	7.4	7.8	8.4	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.5	0.5	0

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	33	107	32	25	116	25	32	208	26	11	295	31
Future Volume (vph)	33	107	32	25	116	25	32	208	26	11	295	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	14	14	14	16	16	16	11	11	11
Grade (%)		-2%			-1%			0%				-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Friction		0.975			0.980			0.987			0.987	
Fit Protected		0.990			0.993			0.994			0.998	
Satd. Flow (prot)	0	1696	0	0	1854	0	0	1978	0	0	1751	0
Fit Permitted		0.918			0.941			0.940			0.989	
Satd. Flow (perm)	0	1573	0	0	1757	0	0	1871	0	0	1736	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					15			13			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2785			863			613			617	
Travel Time (s)		76.0			23.5			16.7			16.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	1%	4%	9%	0%	0%
Adj. Flow (vph)	35	113	34	26	122	26	34	219	27	12	311	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	182	0	0	174	0	0	280	0	0	356	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	0.98	0.98	0.98	0.91	0.91	0.91	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	40		20	40		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	40		20	40		20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023

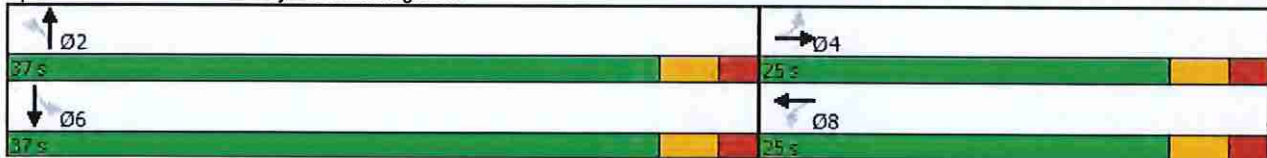


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		37.0	37.0		37.0	37.0	
Total Split (%)	40.3%	40.3%		40.3%	40.3%		59.7%	59.7%		59.7%	59.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effect Green (s)		12.2			12.0			35.0			35.0	
Actuated g/C Ratio		0.24			0.23			0.68			0.68	
v/c Ratio		0.49			0.41			0.22			0.30	
Control Delay		22.3			18.7			5.5			6.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		22.3			18.7			5.5			6.1	
LOS		C			B			A			A	
Approach Delay		22.3			18.7			5.5			6.1	
Approach LOS		C			B			A			A	

Intersection Summary

Area Type: Other
 Cycle Length: 62
 Actuated Cycle Length: 51.1
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 11.1
 Intersection Capacity Utilization 49.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: N Wayne Ave & Eagle Rd



HCM 6th Signalized Intersection Summary
 1: N Wayne Ave & Eagle Rd

05/11/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	33	107	32	25	116	25	32	208	26	11	295	31
Future Volume (veh/h)	33	107	32	25	116	25	32	208	26	11	295	31
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	1875	1875	1875	1911	1896	1852	1872	1857	1814	1858	1986	1986
Adj Flow Rate, veh/h	35	113	34	26	122	26	34	219	27	12	311	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	1	4	0	1	4	9	0	0
Cap, veh/h	126	198	54	113	226	45	164	968	112	89	1171	121
Arrive On Green	0.14	0.16	0.14	0.14	0.16	0.14	0.65	0.67	0.65	0.65	0.67	0.65
Sat Flow, veh/h	235	1201	330	173	1370	271	122	1440	167	20	1742	180
Grp Volume(v), veh/h	182	0	0	174	0	0	280	0	0	356	0	0
Grp Sat Flow(s),veh/h/ln	1765	0	0	1813	0	0	1729	0	0	1941	0	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.6	0.0	0.0	4.3	0.0	0.0	3.0	0.0	0.0	3.6	0.0	0.0
Prop In Lane	0.19		0.19	0.15		0.15	0.12		0.10	0.03		0.09
Lane Grp Cap(c), veh/h	342	0	0	346	0	0	1209	0	0	1341	0	0
V/C Ratio(X)	0.53	0.00	0.00	0.50	0.00	0.00	0.23	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	778	0	0	798	0	0	1209	0	0	1341	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.2	0.0	0.0	19.1	0.0	0.0	3.2	0.0	0.0	3.3	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.1	0.0	0.0	0.4	0.0	0.0	0.5	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	3.5	0.0	0.0	3.3	0.0	0.0	1.5	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.0	0.0	20.2	0.0	0.0	3.6	0.0	0.0	3.7	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		182			174			280			356	
Approach Delay, s/veh		20.5			20.2			3.6			3.7	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		12.1		37.0		12.1				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		5.0		6.6		5.6		6.3				
Green Ext Time (p_c), s		1.9		0.5		2.4		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				9.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
2: Strafford Ave & Eagle Rd

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	39	83	1	18	103	42	16	74	27	53	38	54
Future Volume (vph)	39	83	1	18	103	42	16	74	27	53	38	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	13	13	13	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.999			0.965			0.969			0.950	
Fl _t Protected		0.985			0.995			0.993			0.982	
Satd. Flow (prot)	0	1807	0	0	1752	0	0	1889	0	0	1773	0
Fl _t Permitted		0.985			0.995			0.993			0.982	
Satd. Flow (perm)	0	1807	0	0	1752	0	0	1889	0	0	1773	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		586			2785			417			648	
Travel Time (s)		16.0			76.0			11.4			17.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	45	97	1	21	120	49	19	86	31	62	44	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	143	0	0	190	0	0	136	0	0	169	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 35.9% ICU Level of Service A
 Analysis Period (min) 15

HCM 6th AWSC
2: Strafford Ave & Eagle Rd

05/11/2023

















Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	39	83	1	18	103	42	16	74	27	53	38	54
Future Vol, veh/h	39	83	1	18	103	42	16	74	27	53	38	54
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	45	97	1	21	120	49	19	86	31	62	44	63
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	9.2			9.3			8.9			9.1		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	32%	11%	37%
Vol Thru, %	63%	67%	63%	26%
Vol Right, %	23%	1%	26%	37%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	117	123	163	145
LT Vol	16	39	18	53
Through Vol	74	83	103	38
RT Vol	27	1	42	54
Lane Flow Rate	136	143	190	169
Geometry Grp	1	1	1	1
Degree of Util (X)	0.181	0.195	0.246	0.221
Departure Headway (Hd)	4.793	4.915	4.673	4.714
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	743	725	764	757
Service Time	2.856	2.977	2.731	2.773
HCM Lane V/C Ratio	0.183	0.197	0.249	0.223
HCM Control Delay	8.9	9.2	9.3	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.7	1	0.8

Lanes, Volumes, Timings
 3: Grant Ln/Hedgerow Ln & Strafford Ave

05/11/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	139	1	1	154	2	1	0	1	0	0	1
Future Volume (vph)	1	139	1	1	154	2	1	0	1	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	12	12	12	9	9	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.999			0.999			0.932			0.865	
Fl _t Protected								0.976				
Satd. Flow (prot)	0	1835	0	0	1961	0	0	1728	0	0	1479	0
Fl _t Permitted								0.976				
Satd. Flow (perm)	0	1835	0	0	1961	0	0	1728	0	0	1479	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		580			289			323			292	
Travel Time (s)		15.8			7.9			8.8			8.0	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	167	1	1	186	2	1	0	1	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	189	0	0	2	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	18.9%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	139	1	1	154	2	1	0	1	0	0	1
Future Vol, veh/h	1	139	1	1	154	2	1	0	1	0	0	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	167	1	1	186	2	1	0	1	0	0	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.1	7.5	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	1%	1%	0%
Vol Thru, %	0%	99%	98%	0%
Vol Right, %	50%	1%	1%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	141	157	1
LT Vol	1	1	1	0
Through Vol	0	139	154	0
RT Vol	1	1	2	1
Lane Flow Rate	2	170	189	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.003	0.191	0.211	0.001
Departure Headway (Hd)	4.46	4.043	4.025	4.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	807	885	889	887
Service Time	2.46	2.081	2.061	2.059
HCM Lane V/C Ratio	0.002	0.192	0.213	0.001
HCM Control Delay	7.5	8	8.1	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.7	0.8	0

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	93	25	20	90	17	19	160	14	25	333	36
Future Volume (vph)	12	93	25	20	90	17	19	160	14	25	333	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	14	14	14	16	16	16	11	11	11
Grade (%)		-2%			-1%			0%				-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.982			0.990			0.988	
Flt Protected		0.995			0.992			0.995			0.997	
Satd. Flow (prot)	0	1691	0	0	1784	0	0	1977	0	0	1695	0
Flt Permitted		0.969			0.947			0.952			0.978	
Satd. Flow (perm)	0	1647	0	0	1703	0	0	1891	0	0	1663	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					13			10			12	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2785			863			613			617	
Travel Time (s)		76.0			23.5			16.7			16.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	20%	2%	6%	0%	2%	0%	4%	4%	0%
Adj. Flow (vph)	13	101	27	22	98	18	21	174	15	27	362	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	141	0	0	138	0	0	210	0	0	428	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	0.98	0.98	0.98	0.91	0.91	0.91	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	40		20	40		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	40		20	40		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023

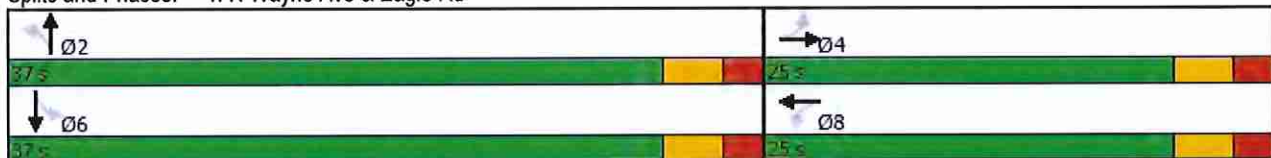


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		37.0	37.0		37.0	37.0	
Total Split (%)	40.3%	40.3%		40.3%	40.3%		59.7%	59.7%		59.7%	59.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		10.7			10.6			36.9			36.9	
Actuated g/C Ratio		0.20			0.20			0.70			0.70	
v/c Ratio		0.42			0.39			0.16			0.37	
Control Delay		21.8			19.2			4.4			5.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.8			19.2			4.4			5.8	
LOS		C			B			A			A	
Approach Delay		21.8			19.2			4.4			5.8	
Approach LOS		C			B			A			A	

Intersection Summary

Area Type: Other
 Cycle Length: 62
 Actuated Cycle Length: 52.5
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 9.9
 Intersection Capacity Utilization 44.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

















Splits and Phases: 1: N Wayne Ave & Eagle Rd



HCM 6th Signalized Intersection Summary













1: N Wayne Ave & Eagle Rd

05/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	93	25	20	90	17	19	160	14	25	333	36
Future Volume (veh/h)	12	93	25	20	90	17	19	160	14	25	333	36
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	1875	1860	1875	1615	1881	1822	1872	1843	1872	1929	1929	1986
Adj Flow Rate, veh/h	13	101	27	22	98	18	21	174	15	27	362	39
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	1	0	20	2	6	0	2	0	4	4	0
Cap, veh/h	96	189	48	114	194	33	145	1053	86	114	1141	118
Arrive On Green	0.12	0.14	0.12	0.12	0.14	0.12	0.67	0.69	0.67	0.67	0.69	0.67
Sat Flow, veh/h	97	1341	341	191	1371	234	91	1524	124	49	1651	170
Grp Volume(v), veh/h	141	0	0	138	0	0	210	0	0	428	0	0
Grp Sat Flow(s),veh/h/ln	1778	0	0	1797	0	0	1739	0	0	1871	0	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.5	0.0	0.0	3.4	0.0	0.0	2.0	0.0	0.0	4.4	0.0	0.0
Prop In Lane	0.09		0.19	0.16		0.13	0.10		0.07	0.06		0.09
Lane Grp Cap(c), veh/h	296	0	0	304	0	0	1248	0	0	1334	0	0
V/C Ratio(X)	0.48	0.00	0.00	0.45	0.00	0.00	0.17	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	812	0	0	814	0	0	1248	0	0	1334	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.3	0.0	0.0	19.2	0.0	0.0	2.6	0.0	0.0	3.0	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	1.1	0.0	0.0	0.3	0.0	0.0	0.6	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	2.7	0.0	0.0	2.6	0.0	0.0	0.9	0.0	0.0	2.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	0.0	20.2	0.0	0.0	2.9	0.0	0.0	3.6	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		141			138			210			428	
Approach Delay, s/veh		20.4			20.2			2.9			3.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		10.7		37.0		10.7				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		4.0		5.5		6.4		5.4				
Green Ext Time (p_c), s		1.4		0.4		3.0		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				8.5								
HCM 6th LOS				A								

Lanes, Volumes, Timings
2: Strafford Ave & Eagle Rd

05/11/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	34	49	8	29	82	24	4	48	20	46	49	37
Future Volume (vph)	34	49	8	29	82	24	4	48	20	46	49	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	13	13	13	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.988			0.976			0.962			0.962	
Fl _t Protected		0.982			0.989			0.997			0.983	
Satd. Flow (prot)	0	1762	0	0	1731	0	0	1883	0	0	1725	0
Fl _t Permitted		0.982			0.989			0.997			0.983	
Satd. Flow (perm)	0	1762	0	0	1731	0	0	1883	0	0	1725	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		586			2785			417			281	
Travel Time (s)		16.0			76.0			11.4			7.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	0%	3%	0%	10%	0%	0%	0%	5%	2%	6%
Adj. Flow (vph)	37	54	9	32	90	26	4	53	22	51	54	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	148	0	0	79	0	0	146	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	29.2%					ICU Level of Service A						
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	34	49	8	29	82	24	4	48	20	46	49	37
Future Vol, veh/h	34	49	8	29	82	24	4	48	20	46	49	37
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	3	0	0	3	0	10	0	0	0	5	2	6
Mvmt Flow	37	54	9	32	90	26	4	53	22	51	54	41
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.6	8	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	37%	21%	35%
Vol Thru, %	67%	54%	61%	37%
Vol Right, %	28%	9%	18%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	72	91	135	132
LT Vol	4	34	29	46
Through Vol	48	49	82	49
RT Vol	20	8	24	37
Lane Flow Rate	79	100	148	145
Geometry Grp	1	1	1	1
Degree of Util (X)	0.099	0.13	0.186	0.184
Departure Headway (Hd)	4.495	4.664	4.525	4.558
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	796	768	792	788
Service Time	2.529	2.697	2.556	2.587
HCM Lane V/C Ratio	0.099	0.13	0.187	0.184
HCM Control Delay	8	8.4	8.6	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.4	0.7	0.7

Lanes, Volumes, Timings
 3: Grant Ln/Hedgerow Ln & Strafford Ave

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	124	2	3	108	0	1	1	1	1	0	0
Future Volume (vph)	1	124	2	3	108	0	1	1	1	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	12	12	12	9	9	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frts		0.998						0.955				
Flt Protected					0.999			0.984			0.950	
Satd. Flow (prot)	0	1764	0	0	1909	0	0	1785	0	0	1624	0
Flt Permitted					0.999			0.984			0.950	
Satd. Flow (perm)	0	1764	0	0	1909	0	0	1785	0	0	1624	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		580			289			323			292	
Travel Time (s)		15.8			7.9			8.8			8.0	
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 (%)	0%	4%	0%	33%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	138	2	3	120	0	1	1	1	1	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	141	0	0	123	0	0	3	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 17.6%

ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

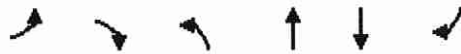
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	124	2	3	108	0	1	1	1	1	0	0
Future Vol, veh/h	1	124	2	3	108	0	1	1	1	1	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	4	0	33	2	0	0	0	0	0	0	0
Mvmt Flow	1	138	2	3	120	0	1	1	1	1	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	8.5	7.4	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	1%	3%	100%
Vol Thru, %	33%	98%	97%	0%
Vol Right, %	33%	2%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	127	111	1
LT Vol	1	1	3	1
Through Vol	1	124	108	0
RT Vol	1	2	0	0
Lane Flow Rate	3	141	123	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.004	0.156	0.157	0.001
Departure Headway (Hd)	4.363	3.992	4.579	4.702
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	895	783	766
Service Time	2.363	2.033	2.607	2.702
HCM Lane V/C Ratio	0.004	0.158	0.157	0.001
HCM Control Delay	7.4	7.8	8.5	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.6	0.6	0

Lanes, Volumes, Timings
13: Strafford Ave & W Site Dr.

05/11/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	5	1	105	1	122
Future Volume (vph)	2	5	1	105	1	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.899				0.866	
Fl _t Protected	0.988					
Satd. Flow (prot)	1688	0	0	1828	1645	0
Fl _t Permitted	0.988					
Satd. Flow (perm)	1688	0	0	1828	1645	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	211			300	68	
Travel Time (s)	4.8			8.2	1.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	4%	0%
Adj. Flow (vph)	2	6	1	117	1	136
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	118	137	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.6%
Analysis Period (min)	15
ICU Level of Service	A

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			Y	Y	
Traffic Vol, veh/h	2	5	1	105	1	122
Future Vol, veh/h	2	5	1	105	1	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	4	0
Mvmt Flow	2	6	1	117	1	136

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	188	69	137	0	0
Stage 1	69	-	-	-	-
Stage 2	119	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	806	1000	1459	-	-
Stage 1	959	-	-	-	-
Stage 2	911	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	805	1000	1459	-	-
Mov Cap-2 Maneuver	805	-	-	-	-
Stage 1	958	-	-	-	-
Stage 2	911	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	935	-	-
HCM Lane V/C Ratio	0.001	-	0.008	-	-
HCM Control Delay (s)	7.5	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
15: Strafford Ave

05/11/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	5	2	104	127	1
Future Volume (vph)	2	5	2	104	127	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.899				0.999	
Flt Protected	0.988			0.999		
Satd. Flow (prot)	1688	0	0	1826	1826	0
Flt Permitted	0.988			0.999		
Satd. Flow (perm)	1688	0	0	1826	1826	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	186			281	300	
Travel Time (s)	4.2			7.7	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	4%	0%
Adj. Flow (vph)	2	6	2	116	141	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	118	142	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 17.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			←	↑	
Traffic Vol, veh/h	2	5	2	104	127	1
Future Vol, veh/h	2	5	2	104	127	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	4	0
Mvmt Flow	2	6	2	116	141	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	262	142	142	0	-	0
Stage 1	142	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	731	911	1453	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	730	911	1453	-	-	-
Mov Cap-2 Maneuver	730	-	-	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1453	-	851	-	-
HCM Lane V/C Ratio	0.002	-	0.009	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	33	112	32	25	123	25	32	208	26	11	295	31
Future Volume (vph)	33	112	32	25	123	25	32	208	26	11	295	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	14	14	14	16	16	16	11	11	11
Grade (%)		-2%			-1%			0%				-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Friction		0.975			0.981			0.987			0.987	
Friction Protected		0.991			0.993			0.994			0.998	
Satd. Flow (prot)	0	1698	0	0	1856	0	0	1978	0	0	1751	0
Friction Permitted		0.918			0.943			0.940			0.989	
Satd. Flow (perm)	0	1573	0	0	1762	0	0	1871	0	0	1736	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					15			13			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2785			863			613			617	
Travel Time (s)		76.0			23.5			16.7			16.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	1%	4%	9%	0%	0%
Adj. Flow (vph)	35	118	34	26	129	26	34	219	27	12	311	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	187	0	0	181	0	0	280	0	0	356	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	0.98	0.98	0.98	0.91	0.91	0.91	1.08	1.08	1.08
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	40		20	40		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	40		20	40		20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
1: N Wayne Ave & Eagle Rd

05/11/2023

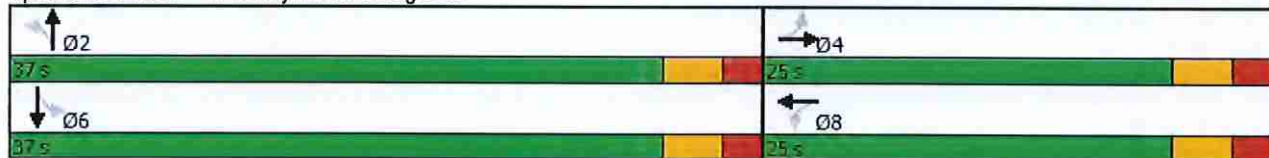


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		37.0	37.0		37.0	37.0	
Total Split (%)	40.3%	40.3%		40.3%	40.3%		59.7%	59.7%		59.7%	59.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effect Green (s)		12.3			12.2			35.0			35.0	
Actuated g/C Ratio		0.24			0.24			0.68			0.68	
v/c Ratio		0.49			0.42			0.22			0.30	
Control Delay		22.3			18.8			5.5			6.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		22.3			18.8			5.5			6.2	
LOS		C			B			A			A	
Approach Delay		22.3			18.8			5.5			6.2	
Approach LOS		C			B			A			A	

Intersection Summary

















Area Type: Other
 Cycle Length: 62
 Actuated Cycle Length: 51.2
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 11.3
 Intersection Capacity Utilization 50.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: N Wayne Ave & Eagle Rd



HCM 6th Signalized Intersection Capacity Analysis
1: N Wayne Ave & Eagle Rd

05/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	112	32	25	123	25	32	208	26	11	295	31
Future Volume (veh/h)	33	112	32	25	123	25	32	208	26	11	295	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1875	1875	1875	1911	1896	1852	1872	1857	1814	1858	1986	1986
Adj Flow Rate, veh/h	35	118	34	26	129	26	34	219	27	12	311	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	1	4	0	1	4	9	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	125	204	54	111	233	44	164	965	112	89	1167	121
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
Prop Arrive On Green	0.15	0.17	0.15	0.15	0.17	0.15	0.65	0.67	0.65	0.65	0.67	0.65
Unsig. Movement Delay												
Ln Grp Delay, s/veh	20.5	0.0	0.0	20.3	0.0	0.0	3.7	0.0	0.0	3.8	0.0	0.0
Ln Grp LOS	C	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		187			181			280			356	
Approach Delay, s/veh		20.5			20.3			3.7			3.8	
Approach LOS		C			C			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		8.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			37.0		12.2		37.0		12.2			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			32.0		20.0		32.0		20.0			
Max Allow Headway (MAH), s			5.5		4.3		5.4		4.3			
Max Q Clear (g_c+1), s			5.0		6.8		5.7		6.5			
Green Ext Time (g_e), s			1.9		0.5		2.4		0.5			
Prob of Phs Call (p_c)			1.00		0.99		1.00		0.99			
Prob of Max Out (p_x)			0.00		0.00		0.00		0.00			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			122		227		20		165			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1440		1220		1742		1390			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			167		322		180		261			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L+T+R		L+T+R		L+T+R		L+T+R			

HCM 6th Signalized Intersection Capacity Analysis
 1: N Wayne Ave & Eagle Rd

05/11/2023

Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	280	0	187	0	356	0	181
Grp Sat Flow (s), veh/h/ln	0	1729	0	1769	0	1941	0	1816
Q Serve Time (g_s), s	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.0	0.0	4.8	0.0	3.7	0.0	4.5
Perm LT Sat Flow (s_l), veh/h/ln	0	1053	0	1251	0	1152	0	1255
Shared LT Sat Flow (s_sh), veh/h/ln	0	1846	0	1857	0	1983	0	1882
Perm LT Eff Green (g_p), s	0.0	32.0	0.0	7.2	0.0	32.0	0.0	7.2
Perm LT Serve Time (g_u), s	0.0	28.3	0.0	2.7	0.0	29.0	0.0	2.5
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	12.6	0.0	2.2	0.0	22.3	0.0	2.6
Serve Time pre Blk (g_fs), s	0.0	3.0	0.0	2.2	0.0	3.7	0.0	2.6
Prop LT Inside Lane (P_L)	0.00	0.12	0.00	0.19	0.00	0.03	0.00	0.14
Lane Grp Cap (c), veh/h	0	1206	0	347	0	1337	0	351
V/C Ratio (X)	0.00	0.23	0.00	0.54	0.00	0.27	0.00	0.52
Avail Cap (c_a), veh/h	0	1206	0	777	0	1337	0	797
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	3.2	0.0	19.2	0.0	3.3	0.0	19.1
Incr Delay (d2), s/veh	0.0	0.5	0.0	1.3	0.0	0.5	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
Control Delay (d), s/veh	0.0	3.7	0.0	20.5	0.0	3.8	0.0	20.3
1st-Term Q (Q1), veh/ln	0.0	0.7	0.0	1.9	0.0	0.9	0.0	1.8
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.80	0.00	1.80	0.00	1.80	0.00	1.80
%ile Back of Q (95%), veh/ln	0.0	1.6	0.0	3.6	0.0	2.0	0.0	3.5
%ile Storage Ratio (RQ%)	0.00	0.07	0.00	0.03	0.00	0.09	0.00	0.11
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	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
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 6th Signalized Intersection Capacity Analysis
1: N Wayne Ave & Eagle Rd

05/11/2023

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (95%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data













Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.10	0.00	0.18	0.00	0.09	0.00	0.14
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	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
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (95%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Lanes, Volumes, Timings
2: Strafford Ave & Eagle Rd

05/11/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	43	85	1	18	104	47	16	77	28	57	39	57
Future Volume (vph)	43	85	1	18	104	47	16	77	28	57	39	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	13	13	13	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.962			0.969			0.950	
Flt Protected		0.984			0.995			0.993			0.982	
Satd. Flow (prot)	0	1805	0	0	1747	0	0	1889	0	0	1773	0
Flt Permitted		0.984			0.995			0.993			0.982	
Satd. Flow (perm)	0	1805	0	0	1747	0	0	1889	0	0	1773	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		586			2785			417			275	
Travel Time (s)		16.0			76.0			11.4			7.5	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	50	99	1	21	121	55	19	90	33	66	45	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	197	0	0	142	0	0	177	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.8%
	ICU Level of Service A
Analysis Period (min)	15

HCM 6th AWSC
2: Strafford Ave & Eagle Rd

05/11/2023

Intersection

Intersection Delay, s/veh	9.3
Intersection LOS	A

















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	43	85	1	18	104	47	16	77	28	57	39	57
Future Vol, veh/h	43	85	1	18	104	47	16	77	28	57	39	57
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	50	99	1	21	121	55	19	90	33	66	45	66
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	9.4	9.1	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	33%	11%	37%
Vol Thru, %	64%	66%	62%	25%
Vol Right, %	23%	1%	28%	37%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	129	169	153
LT Vol	16	43	18	57
Through Vol	77	85	104	39
RT Vol	28	1	47	57
Lane Flow Rate	141	150	197	178
Geometry Grp	1	1	1	1
Degree of Util (X)	0.189	0.207	0.257	0.235
Departure Headway (Hd)	4.844	4.965	4.708	4.761
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	734	717	757	749
Service Time	2.914	3.035	2.773	2.827
HCM Lane V/C Ratio	0.192	0.209	0.26	0.238
HCM Control Delay	9.1	9.3	9.4	9.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.8	1	0.9

Lanes, Volumes, Timings
3: Grant Ln/Hedgerow Ln & Stafford Ave

05/11/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	146	1	1	159	2	1	0	1	0	0	1
Future Volume (vph)	1	146	1	1	159	2	1	0	1	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	12	12	12	9	9	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.999			0.999			0.932			0.865	
Fl _t Protected								0.976				
Satd. Flow (prot)	0	1835	0	0	1961	0	0	1728	0	0	1479	0
Fl _t Permitted								0.976				
Satd. Flow (perm)	0	1835	0	0	1961	0	0	1728	0	0	1479	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		580			289			323			292	
Travel Time (s)		15.8			7.9			8.8			8.0	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	176	1	1	192	2	1	0	1	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	178	0	0	195	0	0	2	0	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	0.96	0.96	0.96	1.00	1.00	1.00	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	19.2%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM 6th AWSC
3: Grant Ln/Hedgerow Ln & Strafford Ave

05/11/2023

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	146	1	1	159	2	1	0	1	0	0	1
Future Vol, veh/h	1	146	1	1	159	2	1	0	1	0	0	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	176	1	1	192	2	1	0	1	0	0	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8.2	7.5	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	1%	1%	0%
Vol Thru, %	0%	99%	98%	0%
Vol Right, %	50%	1%	1%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	148	162	1
LT Vol	1	1	1	0
Through Vol	0	146	159	0
RT Vol	1	1	2	1
Lane Flow Rate	2	178	195	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.003	0.2	0.219	0.001
Departure Headway (Hd)	4.491	4.047	4.032	4.09
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	802	883	888	880
Service Time	2.491	2.088	2.068	2.09
HCM Lane V/C Ratio	0.002	0.202	0.22	0.001
HCM Control Delay	7.5	8.1	8.2	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.7	0.8	0

Lanes, Volumes, Timings
13: Strafford Ave & W Site Dr

05/11/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘			↖	↗	
Traffic Volume (vph)	2	3	6	156	148	3
Future Volume (vph)	2	3	6	156	148	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.997	
Flt Protected	0.984			0.998		
Satd. Flow (prot)	1701	0	0	1896	1894	0
Flt Permitted	0.984			0.998		
Satd. Flow (perm)	1701	0	0	1896	1894	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	190			315	58	
Travel Time (s)	5.2			8.6	1.6	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	2	4	7	188	178	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	195	182	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.1%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	2	3	6	156	148	3
Future Vol, veh/h	2	3	6	156	148	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	4	7	188	178	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	382	180	182	0	-	0
Stage 1	180	-	-	-	-	-
Stage 2	202	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.3	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	710	919	1041	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	963	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	704	919	1041	-	-	-
Mov Cap-2 Maneuver	704	-	-	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	963	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.4	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1041	-	819	-	-	
HCM Lane V/C Ratio	0.007	-	0.007	-	-	
HCM Control Delay (s)	8.5	0	9.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
 15: Strafford Ave & E Site Dr.

05/11/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖			↑	↓	
Traffic Volume (vph)	1	4	6	161	149	2
Future Volume (vph)	1	4	6	161	149	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.887			0.999		
Flt Protected	0.992			0.998		
Satd. Flow (prot)	1672	0	0	1896	1898	0
Flt Permitted	0.992			0.998		
Satd. Flow (perm)	1672	0	0	1896	1898	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	185			275	315	
Travel Time (s)	4.2			7.5	8.6	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	5	7	194	180	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	201	182	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.3%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	1	4	6	161	149	2
Future Vol, veh/h	1	4	6	161	149	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	5	7	194	180	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	389	181	182	0	0	
Stage 1	181	-	-	-	-	
Stage 2	208	-	-	-	-	
Critical Hdwy	6.4	6.2	4.3	-	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	
Follow-up Hdwy	3	3.1	3	-	-	
Pot Cap-1 Maneuver	704	918	1041	-	-	
Stage 1	985	-	-	-	-	
Stage 2	957	-	-	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	698	918	1041	-	-	
Mov Cap-2 Maneuver	698	-	-	-	-	
Stage 1	977	-	-	-	-	
Stage 2	957	-	-	-	-	
Approach	EB	NB	SB			
HCM Control Delay, s	9.2	0.3	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1041	-	864	-	-	
HCM Lane V/C Ratio	0.007	-	0.007	-	-	
HCM Control Delay (s)	8.5	-	9.2	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

0889

Radnor Township

PLAN SYMBOL NUMBER	SIZE	REMARKS
101-1	30x30	NO TURN ON RED
101-2	30x30	NO TURN
101-3	30x30	RIGHT CLEARANCE MARKER
101-4	30x30	LEFT CLEARANCE MARKER
101-5	30x30	STOP SIGN ON RED

GENERAL NOTES

NO MODIFICATIONS TO THIS INSTALLATION ARE PERMITTED UNLESS THEY ARE APPROVED BY THE ENGINEER OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF SIGNALS, SHALL BE COMPLETED WITHIN THE TIME FRAME OF THE CONTRACT.

ALL SIGNALS AND MOUNTING HARDWARE INDICATED ON THIS DRAWING SHALL BE INSTALLED IN ACCORDANCE WITH THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND STANDARDS.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL MOUNTING POST CENTERED ON THE FACE OF CURB OF THE ROADWAY. THE SIGNAL SHALL BE A MINIMUM OF 8 FT ABOVE THE ROADWAY SURFACE.

SIGNALS MOUNTED UNDER THE HIGHWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 14 FT ABOVE THE ROADWAY SURFACE.

ALL SIGNALS SHALL BE MOUNTED TO THE SIGNAL MOUNTING POST WITH THE SIGNAL MOUNTING HARDWARE.

THE SIGNAL MOUNTING HARDWARE SHALL BE INSTALLED IN ACCORDANCE WITH THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND STANDARDS.

EXACT LOCATION OF DETECTOR SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF THE ENGINEER.

CONDUITS TO BE INSTALLED BY THE CONTRACTOR SHALL BE INSTALLED IN ACCORDANCE WITH THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND STANDARDS.

THE LOCAL OFFICIALS AND UTILITY COMPANIES TO REMOVE ANY EXISTING SIGNALS SHALL BE NOTIFIED BY THE CONTRACTOR.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES UNDER THE ROADWAY.

ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES UNDER THE ROADWAY.

ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ENGINEER.

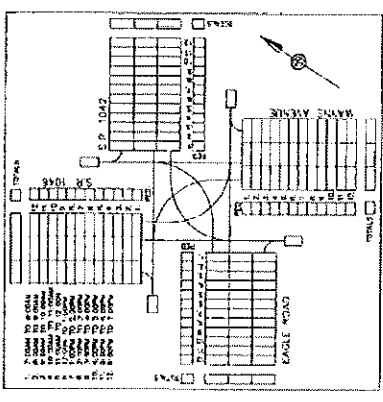
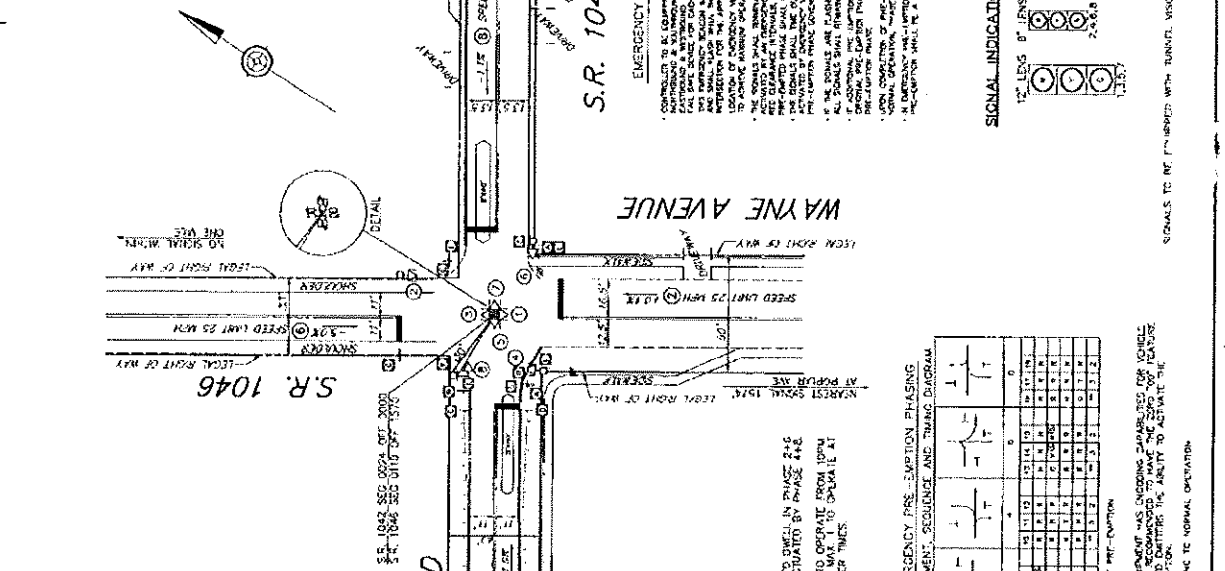
EMERGENCY PRE-EMPTION NOTES:

1. SIGNAL TO BE OPERATED IN PHASE 2-4-6

2. MAX 3 TO OPERATE FROM 100% TO 50% MAX 1 TO OPERATE AT ALL OTHER TIMES

3. SIGNAL TO BE OPERATED IN PHASE 2-4-6

4. MAX 3 TO OPERATE FROM 100% TO 50% MAX 1 TO OPERATE AT ALL OTHER TIMES



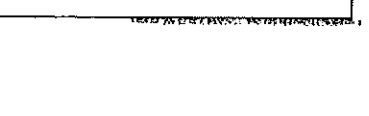
S.R. 1042

S.R. 1046

S.R. 1042

EMERGENCY PRE-EMPTION PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12
PHASE	1	2	3	4	5	6	7	8	9	10	11	12
MINIMUM	3	2	3	2	3	2	3	2	3	2	3	2
MAXIMUM	3	2	3	2	3	2	3	2	3	2	3	2
MAX 1	3	2	3	2	3	2	3	2	3	2	3	2
MAX 2	3	2	3	2	3	2	3	2	3	2	3	2
MAX 3	3	2	3	2	3	2	3	2	3	2	3	2
MAX 4	3	2	3	2	3	2	3	2	3	2	3	2
MAX 5	3	2	3	2	3	2	3	2	3	2	3	2
MAX 6	3	2	3	2	3	2	3	2	3	2	3	2
MAX 7	3	2	3	2	3	2	3	2	3	2	3	2
MAX 8	3	2	3	2	3	2	3	2	3	2	3	2
MAX 9	3	2	3	2	3	2	3	2	3	2	3	2
MAX 10	3	2	3	2	3	2	3	2	3	2	3	2
MAX 11	3	2	3	2	3	2	3	2	3	2	3	2
MAX 12	3	2	3	2	3	2	3	2	3	2	3	2



SIGNAL INDICATIONS

12" LENS 8" LENS

LEGEND

1. REGULAR SIGNAL HEAD/BACKLITE/ARROW

2. STOP SIGN

3. STOP SIGN ON RED

4. STOP SIGN ON RED

5. STOP SIGN ON RED

6. STOP SIGN ON RED

7. STOP SIGN ON RED

8. STOP SIGN ON RED

9. STOP SIGN ON RED

10. STOP SIGN ON RED

11. STOP SIGN ON RED

12. STOP SIGN ON RED

EMERGENCY PRE-EMPTION PHASES

1. SIGNAL TO BE OPERATED IN PHASE 2-4-6

2. MAX 3 TO OPERATE FROM 100% TO 50% MAX 1 TO OPERATE AT ALL OTHER TIMES

3. SIGNAL TO BE OPERATED IN PHASE 2-4-6

4. MAX 3 TO OPERATE FROM 100% TO 50% MAX 1 TO OPERATE AT ALL OTHER TIMES

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: DELAWARE

MUNICIPALITY: RADNOR TOWNSHIP

INTERSECTION: WAYNE AVENUE (S.R. 1046) AND EAGLE ROAD (S.R. 1042)

DATE: 11-4-87

DESIGNED BY: WERNER J. EICHORN

PROJECT NO.: 11-4-87

SCALE: 1" = 40'

SHEET 2 OF 2

Kadner 107 # 088

GENERAL NOTES

NO NOTATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS THE CONTRACTOR IS ADVISED BY A REPRESENTATIVE OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION.

ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING SHALL BE INSTALLED WITHIN THE SPECIFIED TIME FRAME AND SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING SHALL BE INSTALLED WITHIN THE SPECIFIED TIME FRAME AND SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING SHALL BE INSTALLED WITHIN THE SPECIFIED TIME FRAME AND SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION.

THE DRAWING SHALL BE USED AS A CONSTRUCTION DRAWING AND NOT AS A PERMANENT RECORD DRAWING.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL JURISDICTION.

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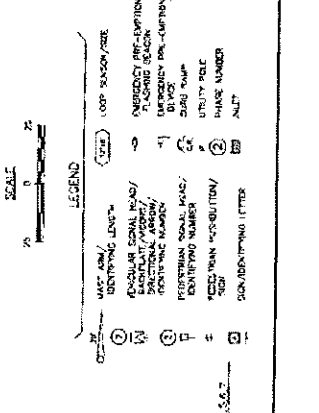
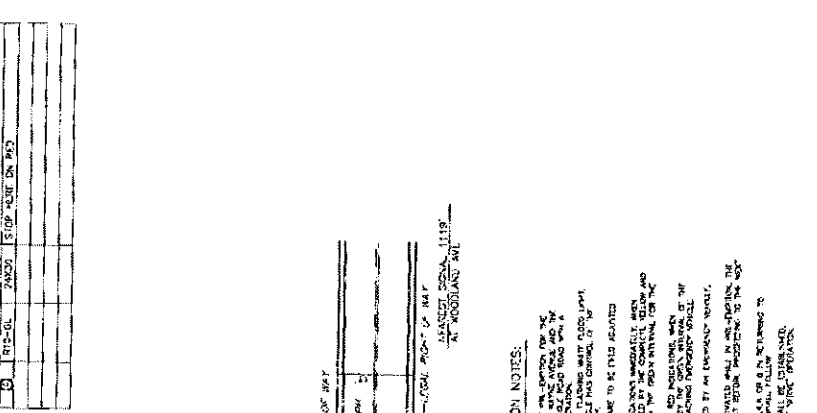
THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL JURISDICTION.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
 ENGINEERING DISTRICT 6-0

COUNTY: DELAWARE
 MUNICIPALITY: RADBOR TOWNSHIP
 INTERSECTION: WAYNE AVENUE (S.R. 1046) AND EAGLE ROAD (S.R. 1042)

DATE: 11-14-87
 DRAWN BY: J. BOGARD
 CHECKED BY: J. BOGARD
 APPROVED BY: J. BOGARD

PLAN NUMBER	SERIES	DESCRIPTION	REMARKS
101-1	101-1	101-1	NO TURN ON RED
102-2	102-2	102-2	NO TURN ON RED
103-3	103-3	103-3	RIGHT TURN ON RED
104-4	104-4	104-4	RIGHT TURN ON RED
105-5	105-5	105-5	RIGHT TURN ON RED
106-6	106-6	106-6	RIGHT TURN ON RED
107-7	107-7	107-7	RIGHT TURN ON RED
108-8	108-8	108-8	RIGHT TURN ON RED
109-9	109-9	109-9	RIGHT TURN ON RED
110-10	110-10	110-10	RIGHT TURN ON RED
111-11	111-11	111-11	RIGHT TURN ON RED
112-12	112-12	112-12	RIGHT TURN ON RED
113-13	113-13	113-13	RIGHT TURN ON RED
114-14	114-14	114-14	RIGHT TURN ON RED
115-15	115-15	115-15	RIGHT TURN ON RED

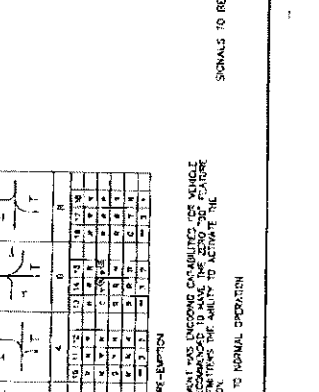
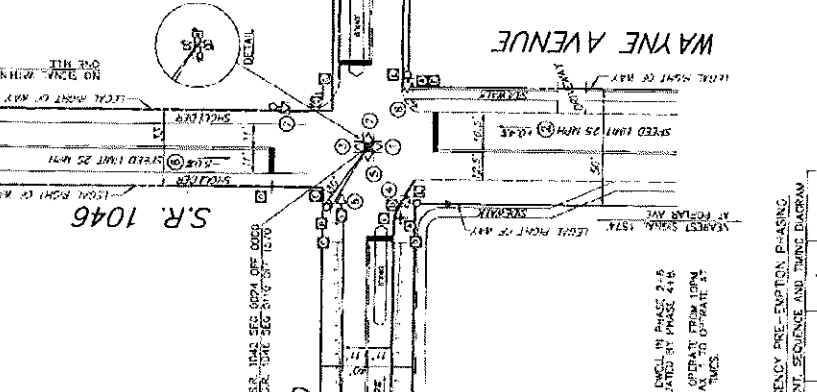


EMERGENCY PRE-EMPTION NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL JURISDICTION.

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EMERGENCY PRE-EMPTION PHASING

MOVEMENT SEQUENCE AND TIMING DIAGRAM

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
W															
E															
N															
S															

NOTES:
 IF THE EMERGENCY PRE-EMPTION PHASING IS USED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL JURISDICTION.

EMERGENCY PRE-EMPTION PHASING

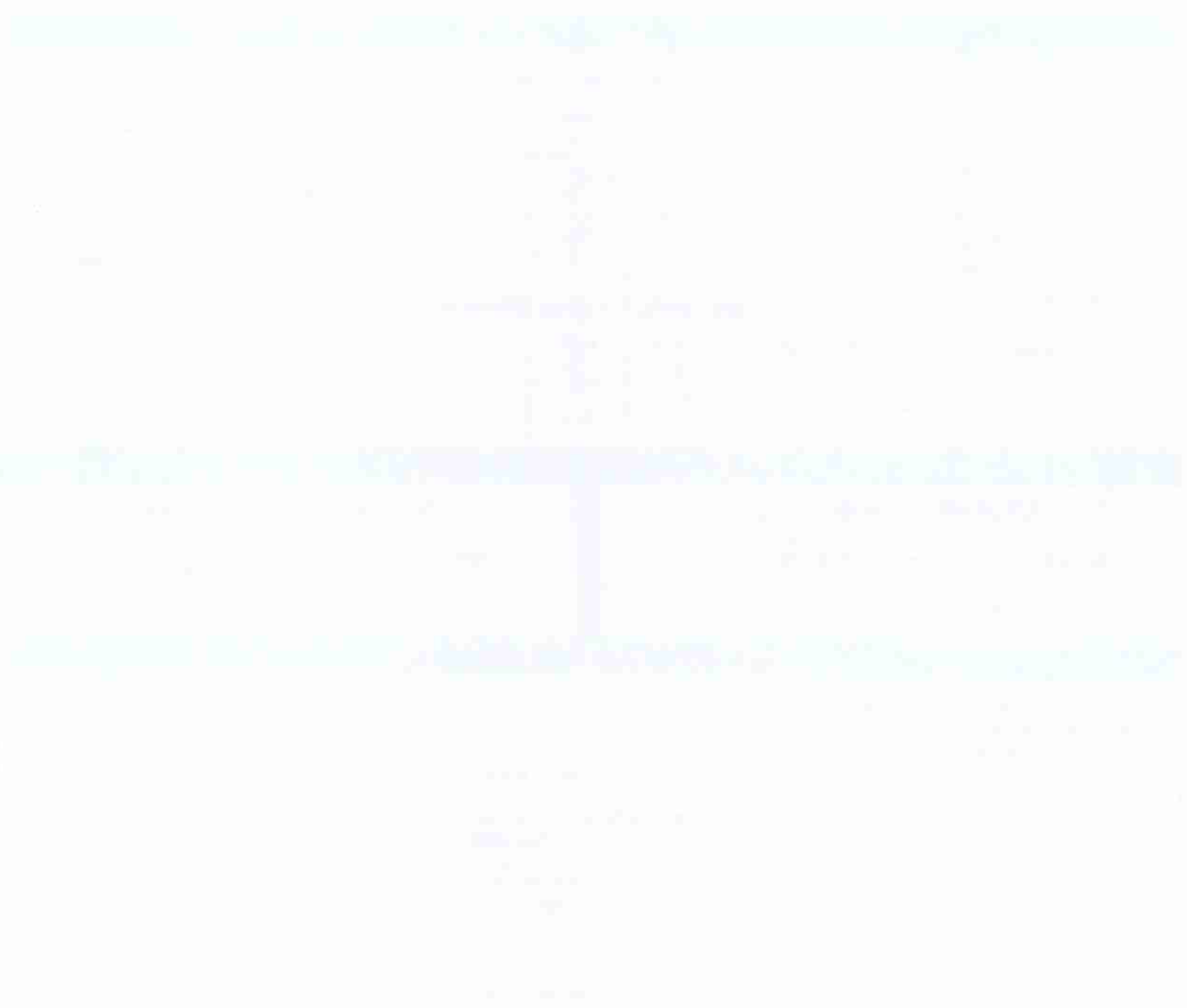
MOVEMENT SEQUENCE AND TIMING DIAGRAM

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
W															
E															
N															
S															

NOTES:
 IF THE EMERGENCY PRE-EMPTION PHASING IS USED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL JURISDICTION.

APPENDIX G

Auxiliary Turn Lane Warrants



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION			
Municipality:	Radnor	Analysis Date:	5/11/2023
County:	Delaware County	Conducted By:	FT
PennDOT Engineering District:	6	Checked By:	WB Approach
		Agency/Company Name:	FTA
Intersection & Approach Description: Strafford Ave & Site Driveway			
Analysis Period:	2028	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Unsignalized	Type of Analysis	
Posted Speed Limit (MPH):	25	Left or Right-Turn Lane Analysis?: Left Turn Lane	
Type of Terrain:	Level		

VOLUME CALCULATIONS					
Left Turn Lane Volume Calculations					
Movement	Include?	Volume	% Trucks	PCEV	
Advancing	Left	Yes	6	0.0%	6
	Through	-	161	5.0%	166
	Right	No	0	0.0%	N/A
Opposing	Left	No	0	0.0%	N/A
	Through	-	149	5.0%	153
	Right	Yes	3	0.0%	3
					Advancing Volume: 172
					Opposing Volume: 156
					Left Turn Volume: 6
					% Left Turns in Advancing Volume: 3.49%
Right Turn Lane Volume Calculations					
Movement	Include?	Volume	% Trucks	PCEV	
Advancing	Left	No	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	-	0	0.0%	N/A
					Advancing Volume: N/A
					Right Turn Volume: N/A

TURN LANE WARRANT FINDINGS			
Left Turn Lane Warrant Findings		Right Turn Lane Warrant Findings	
Applicable Warrant Figure: Figure 1		Applicable Warrant Figure: N/A	
Warrant Met?: No		Warrant Met?: N/A	

TURN LANE LENGTH CALCULATIONS						
Intersection Control:	Unsignalized					
Design Hour Volume of Turning Lane:	6					
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:						
hypothetical analysis of picks the highest volumes found at either of the two proposed driveways. Analysis also focuses on PM peak hour since that has highest inbound (returning) site traffic AND highest Strafford Avenue through volumes						

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Radnor"/>	Analysis Date: <input type="text" value="5/11/2023"/>
County: <input type="text" value="Delaware County"/>	Conducted By: <input type="text" value="FT"/>
PennDOT Engineering District: <input type="text" value="6"/>	Checked By: <input type="text" value="EB Approach"/>
	Agency/Company Name: <input type="text" value="FTA"/>
Intersection & Approach Description: <input type="text" value="Strafford Ave & Site Driveway"/>	
Analysis Period: <input type="text" value="2028"/>	Number of Approach Lanes: <input type="text" value="1"/>
Design Hour: <input type="text" value="PM Peak Hour"/>	Undivided or Divided Highway: <input type="text" value="Undivided"/>
Intersection Control: <input type="text" value="Unsignalized"/>	Type of Analysis
Posted Speed Limit (MPH): <input type="text" value="25"/>	
Type of Terrain: <input type="text" value="Level"/>	
	Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	No	0	0.0%	N/A
Opposing	Left	No	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	149	5.0%	153
	Right	-	3	0.0%	3

Advancing Volume:	<input type="text" value="156"/>
Right Turn Volume:	<input type="text" value="3"/>

TURN LANE WARRANT FINDINGS

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

TURN LANE LENGTH CALCULATIONS

Intersection Control:	<input type="text" value="Unsignalized"/>
Design Hour Volume of Turning Lane:	<input type="text" value="3"/>
Cycles Per Hour (Assumed):	<input type="text" value="60"/>
Cycles Per Hour (If Known):	<input type="text"/>
Average # of Vehicles/Cycle:	<input type="text" value="N/A"/>

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

Additional Findings:

Additional Comments / Justifications:

APPENDIX H

Accident Investigations

Point 40.047067
75.282522

Geographic Selection

Point **Intersection** Line Route Polygon Region

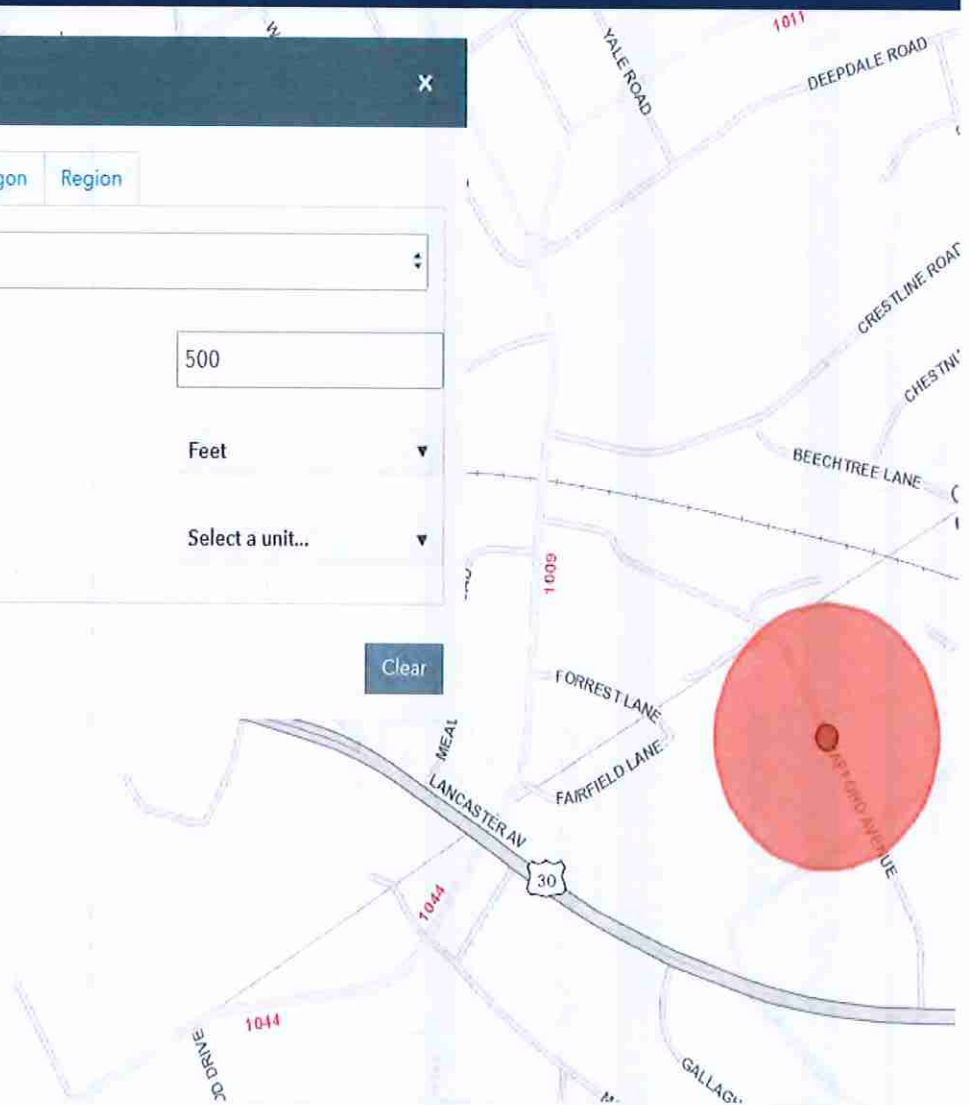
Point Coordinates

Buffer Distance:

Buffer Distance Units:

Buffer Area Unit:

Clear



Disclaimer Notes:

- 1) The information contained in this document is drawn from raw data and should not be interpreted as representing an engineering judgment or determination made by the [
- 2) The data available in this application is dynamic. Data may be added or changed as additional information is made available to the Department

Pennsylvania Crash Information Tool



Date Range: 01/01/2017 to 12/31/2022*

CRASH SEVERITY LEVEL BY YEAR

	2017		2018		2019		ALL YEARS	
	CRASHES	PERSONS	CRASHES	PERSONS	CRASHES	PERSONS	CRASHES	PERSONS
POSSIBLE INJURY	0	1	1	0	0	1	1	2
PROPERTY DMG ONLY	2	0	0	1	1	3	3	4
TOTAL	2	1	1	1	1	4	4	6

CRASH DESCRIPTION TYPES BY YEAR

	2017		2018		2019		ALL YEARS	
	CRASHES	PERSONS	CRASHES	PERSONS	CRASHES	PERSONS	CRASHES	PERSONS
ANGLE	2	1	1	0	0	3	3	4
HEAD ON	0	0	0	1	1	1	1	2
TOTAL	2	1	1	1	1	4	4	6

PERSON INJURY SUMMARY BY YEAR

	2017		2018		2019		ALL YEARS	
	PERSONS	CRASHES	PERSONS	CRASHES	PERSONS	CRASHES	PERSONS	
FATALITIES	0	0	0	0	0	0	0	
SUSPECTED SERIOUS INJURIES	0	0	0	0	0	0	0	
SUSPECTED MINOR INJURIES	0	0	0	0	0	0	0	
POSSIBLE INJURIES	0	1	0	0	0	1	1	
UNKNOWN SEVERITY	0	0	0	0	0	0	0	
UNKNOWN IF INJURED	0	0	0	0	0	0	0	

* PLEASE NOTE: Years which do not appear in the report contain zero crashes for this request.

* Complete records of reportable crashes are available in PCIT for the following years: 2003 - 2022

* Crash information for 2023 is incomplete at the time of this printing. As such, data for 2023 is not included in this report.

IMPORTANT: The information contained in this document is drawn from raw data and should not be interpreted as representing an engineering judgement or determination made by the Department of Transportation as to the type and severity of accidents noted herein.

PCIT - PUBLIC REQUEST / PRESS INQUIRY REPORT (01-07)

NOTES:

1 Injury Severity Disclaimer

Please note that beginning January 1, 2016, PennDOT adopted the Federal standard for collecting injury severity data. The field descriptions and definitions changed from the state standard that had been in use for decades. This resulted in a substantial shift in severity levels. Therefore, comparison of the "Suspected Serious Injury", "Suspected Minor Injury" and "Possible Injury" categories will not be consistent for crashes taking place before versus after the adoption of the new standard.

REPORT PARAMETERS:

Date Range: 01/01/2017 to 12/31/2022

Selected Shapes: Point 40.047067, -75.399589, Point 40.047067, -75.399589 - Buffer (500 feet)

Filter Characteristics:

This report counts the number of crashes.

