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March 3, 2017

Mr. Chris Patriarca, AICP
Westtown Township
1039 Wilmington Pike
West Chester, PA 19382

RE: Crebilly Residential Development
Traffic Engineering Review
Westtown Township, Chester County, PA
McMahon Project No. 816451.11

Dear Mr. Patriarca:

McMahon Associates, Inc. is in receipt of Kimley-Horn and Associates, Inc.'s comment letter, dated February 6, 2017, with regard to the revised Transportation Impact Study for the above referenced project. On behalf of the applicant, below is a summary of the TIS comments in italics, with our responses following each comment.

General

Comment #1: *The revised Transportation Impact Study and associated correspondence only addressed a portion of the comments in the previous review letter dated December 27, 2016.*

Response: The study addresses those aspects of the comments which are within the subject application and within the purview of the Township requirements.

Comment #2: *As previously noted the materials provided to the Township do not clearly demonstrate that peak traffic will be accommodated in a safe and efficient manner, or identify improvements that the applicant is committed to complete or fund. {§170-2009 D(1)(h)} Specifically:*

a. The revised analyses of the intersection of US 202 and PA 926 indicate that the southbound queues will extend beyond the proposed access during both morning and evening peak periods, and beyond West Pleasant Grove Road during the evening peak. This will have a significant impact on the arrival and departure patterns of project traffic.
b. The study states that the eastern access to West Pleasant Grove Road will be relocated such that adequate sight distance will be provided, however measurements of sight distance for exiting and entering traffic at the proposed location have not been provided.

Response:

a. Under the future 2028 without-development conditions, southbound U.S. Route 202 vehicular queues extend beyond the proposed site access during the weekday morning peak hour, and beyond West Pleasant Grove Road during the weekday afternoon peak hour. With the proposed development and recommended improvements at the intersection of U.S. Route 202 and Street Road (S.R. 0926), the southbound U.S. Route 202 queues are reduced during both peak hours from without- to with-development conditions, and therefore, the traffic impact from the development is mitigated. Notwithstanding, if the Township desires, the applicant is prepared to eliminate the site access along U.S. Route 202.

b. Sight distance measurements have been completed for the relocation of the West Pleasant Grove Road and East Site Access. The eastern site access to West Pleasant Grove Road will be relocated approximately 625 feet west of Hidden Pond Drive. **Table 1** summarizes the available sight distance measurements, as well as the sight distance requirements at the relocated eastern site access. The existing available sight distances exceed the requirements for all movements.

A revised draft plan is provided in **Attachment 1**, illustrating the new access location, as well as photographs illustrating the available sight distance at this new access location. With the new access location, the sight distance requirements are satisfied, and less of the woodlands will be disturbed than initially proposed.

Table 1. Sight Distance Evaluation
West Pleasant Grove Road and East Site Access (Relocated)

Movement	Direction	Posted Speed (mph)	Approximate Grade	PennDOT Requirements (feet)		Township Requirements (feet)(3)	Available Sight Distance (feet)
				Desirable[1]	Acceptable[2]		
Exiting	Looking Left	35	+6.4%	440′	N/A	440′	800′+
	Looking Right	35	-3.0%	350′	N/A	440′	445′
Left turn Entering	Looking Ahead From the Rear	35	+6.4%	300′	N/A	N/A	800′+
		35	-3.0%	N/A	45 mph=415′	N/A	415′

(1) Based on the desirable sight distance requirements contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads* and the posted speed limit, unless otherwise noted.
(2) Based on the safe stopping sight distance requirements contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads* and an estimated 85th percentile travel speed of five miles over the posted speed limit.
(3) Based on the clear sight triangle requirements per Westtown Township Code Chapter 149 Article IX Section 149 -915, and the posted speed limit.

Transportation Impact Study

Comment #3:

The explanation provided for the variation in volumes along US 202 is insufficient given the critical nature of this route. As presented 70% of project traffic will utilize US 202 and the operation of the US 202 and PA 926 intersection will significantly influence the operation of the proposed site accesses. These variations, in some cases exceeding 10% of the critical volumes,

warrant additional consideration, both to provide context for the apparent changes in travel patterns and to support other study assumptions such as "regional" growth. This intersection has been the subject of numerous studies over the last several decades by PennDOT, various developers and the Regional Planning Commission. This data should be assembled and reviewed to ensure that the volumes utilized to assess the site accesses and impacts are reasonably accurate.

Response: The traffic counts at the intersection of U.S. Route 202 and PA Route 926 were conducted in accordance with industry standard techniques and in accordance with the requirements outlined in the Township ordinance. With the counted traffic data, as well as the initial queue observations, the traffic analyses reflect the existing traffic conditions accurately. Recent traffic count data collected at the nearby intersection of U.S. Route 202 and Skiles Boulevard (**Attachment 2**) also demonstrates consistency with the balanced adjusted traffic volumes utilized for the traffic analyses.

Comment #4: *Existing condition peak hour traffic counts are to be collected on a Thursday or Friday during any month from April to November. {§149-804.A(3)(g)}. As part of the Land Development Approval process the applicant should request a waiver from the Township for the counts of New Street and West Pleasant Grove Road.*

Response: As a result of filing the application in November, it was impossible to comply with the count period for the added study intersections that was requested in the December 27, 2016 Kimley Horn review letter. The peak hour traffic counts at the intersection of New Street and West Pleasant Grove Road were completed on Thursday, January 12, 2017, as it was added to the study area during the review process. These traffic volumes were compared to the immediately adjacent study intersection of New Street and Street Road (S.R. 0926), which was counted on Thursday, September 8, 2016 in compliance with the ordinance criteria. The traffic volumes at New Street and West Pleasant Grove Road were balanced upwardly to reflect traffic conditions in accordance with the ordinance based on the adjacent traffic counts. If requested by the Township, traffic counts will be completed at this intersection in April to verify the results of the study.

Comment #5: *The TIS should include figures and volume development tables for the "Site Access Opposite Bridlewood Boulevard" alternative.*

Response: The requested information is provided in **Attachment 3**.

Comment #6: *The TIS tables should summarize the results of the future build out 2023 analyses to clearly demonstrate that peak traffic will be accommodated in an efficient manner.*

Response: Tables illustrating the results of the future 2023 traffic analyses that were included in the study are provided in **Attachment 4**.

Comment #7: *The study should include post-development turn lane warrant analyses for Alternative A for the off-site study area intersections. Additionally, the study should note locations where project related traffic significantly impact the results.*

Response: Turn lane warrant analysis worksheets are provided in **Attachment 5** for Alternative A. It is noted that since the difference in total intersection traffic volumes at these three off-site study area intersections during both peak hours is less than 6 vehicles from Alternative A to Alternative B, the results of the turn lane warrant analyses are identical for both alternatives.

Comment #8: *The optimized signal timings used in the analysis for the intersection of Street Road (SR 926) and New Street result in unacceptable increases in delays for the eastbound approach during the morning peak hour. A more balanced traffic signal timing should be utilized.*

Response: The optimized timings have been adjusted for the weekday morning peak hour for the without-development and with-development conditions, and the traffic analysis worksheets are provided in **Attachment 6**. All timing modifications are subject to PennDOT review and approval.

Comment #9: *Provide documentation that sight distance requirements for vehicles entering and exiting the site via West Pleasant Grove Road at the East Site Access will be met if the proposed access is relocated to the crest of the vertical curve. Ensure that the sight distance for the West Pleasant Grove Road accesses are evaluated consistent with Township requirements. {§149-915K(5)}.*

Response: Sight distance measurements have been completed for the relocation of the West Pleasant Grove Road and East Site Access. The eastern site access to West Pleasant Grove Road will be relocated approximately 625 feet west of Hidden Pond Drive. **Table 1** summarizes the available sight distance measurements, as well as the sight distance requirements at the relocated eastern site access. The existing available sight distances exceed the requirements for all movements.

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(3) Based on the clear sight triangle requirements per Westtown Township Code Chapter 149 Article IX Section 149 -915, and the posted speed limit.

If there are any questions or if additional information is needed, please feel free to contact me at nkline@mcmahonassociates.com or (610) 594-9995.

Sincerely,

Nicole R Kline

Nicole R. Kline, P.E., PTOE
Senior Project Manager

NRK

Attachment

cc: Albert Federico, P.E., PTOE, Kimley-Horn
Robert Pingar, P.E., Westtown Township
Andrew Semon, Toll Brothers
Michael Downs, P.E., Toll Brothers
Gregg Adelman, Esq., Kaplin Stewart

I:\eng\816451 - Crebilly Farm\Correspondence\Out\Township\2017-3-3 Response to TWP TIS Comments.docx

ATTACHMENT 1

Comment 2B


WEST PLEASANT GROVE ROAD
DUNSEGAN RD.
ROAD C
ROAD D

New Access Location, West Pleasant Grove Road – Approximately 625 feet west of Hidden Pond Way.

ATTACHMENT 2

Comment 3

McMahon Associates, Inc.

425 Commerce Drive, Suite 200
Fort Washington, P A 19034

Municipality: Westtown Township
Location: Route 202 &
Skiles Boulevard
Counter/Board #: BW+LB

File Name : skiles01w
Site Code : 81568701
Start Date : 11/17/2015
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Route 202 Southbound					Skiles Blvd Westbound				Route 202 Northbound				Jug handle Northeastbound	Skiles Blvd Eastbound					
Start Time	Left	Thru	Bear Right	ROR	Right	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Peds	Left	Thru	ROR	Right	Hard Right	Int. Total
07:00	0	389	39	0	22	8	5	0	18	0	383	0	3	0	14	10	0	3	0	894
07:15	0	451	21	0	50	6	21	0	14	0	491	0	2	0	11	12	0	2	0	1081
07:30	0	395	93	0	44	8	55	0	19	0	408	0	1	0	35	41	0	15	0	1114
07:45	0	312	71	0	52	13	75	0	22	0	328	0	2	0	31	78	0	18	0	1002
Total	0	1547	224	0	168	35	156	0	73	0	1610	0	8	0	91	141	0	38	0	4091
08:00	0	369	17	0	17	10	19	0	20	0	363	0	2	0	34	37	0	12	0	900
08:15	0	349	8	0	22	11	17	0	13	0	356	0	1	0	11	10	0	3	0	801
08:30	0	332	17	0	33	10	25	0	13	0	312	0	2	0	33	39	0	20	0	836
08:45	0	341	40	0	54	8	43	0	18	0	393	0	3	0	36	38	0	13	0	987
Total	0	1391	82	0	126	39	104	0	64	0	1424	0	8	0	114	124	0	48	0	3524
16:00	0	441	30	0	8	12	5	0	13	0	463	0	3	0	26	29	0	4	0	1034
16:15	0	478	20	0	21	7	38	0	17	0	437	0	1	0	16	24	0	2	0	1061
16:30	0	505	28	0	13	15	17	0	14	0	415	0	2	0	47	57	0	12	0	1125
16:45	0	372	68	0	16	17	26	0	20	0	382	0	5	0	15	32	0	8	0	961
Total	0	1796	146	0	58	51	86	0	64	0	1697	0	11	0	104	142	0	26	0	4181
17:00	0	414	15	0	7	12	10	0	6	0	408	0	11	0	23	49	0	16	0	971
17:15	0	488	13	0	6	4	4	0	12	0	435	0	6	0	13	17	0	0	0	998
17:30	0	424	12	0	4	3	8	0	10	0	404	0	10	0	9	19	0	2	0	905
17:45	0	428	24	0	5	2	5	0	10	0	446	0	4	0	9	31	0	4	0	968
Total	0	1754	64	0	22	21	27	0	38	0	1693	0	31	0	54	116	0	22	0	3842
Grand Total	0	6488	516	0	374	146	373	0	239	0	6424	0	58	0	363	523	0	134	0	15638
Apprch %	0	87.9	7	0	5.1	19.3	49.2	0	31.5	0	99.1	0	0.9	0	35.6	51.3	0	13.1	0	
Total %	0	41.5	3.3	0	2.4	0.9	2.4	0	1.5	0	41.1	0	0.4	0	2.3	3.3	0	0.9	0	
Passenger Vehicles																				
% Passenger Vehicles	0	93.4	94.4	0	95.2	97.9	94.9	0	98.3	0	92.9	0	96.6	0	95	97.1	0	94.8	0	93.6
Heavy Vehicles	0	431	29	0	18	3	19	0	4	0	458	0	2	0	18	15	0	7	0	1004
% Heavy Vehicles	0	6.6	5.6	0	4.8	2.1	5.1	0	1.7	0	7.1	0	3.4	0	5	2.9	0	5.2	0	6.4

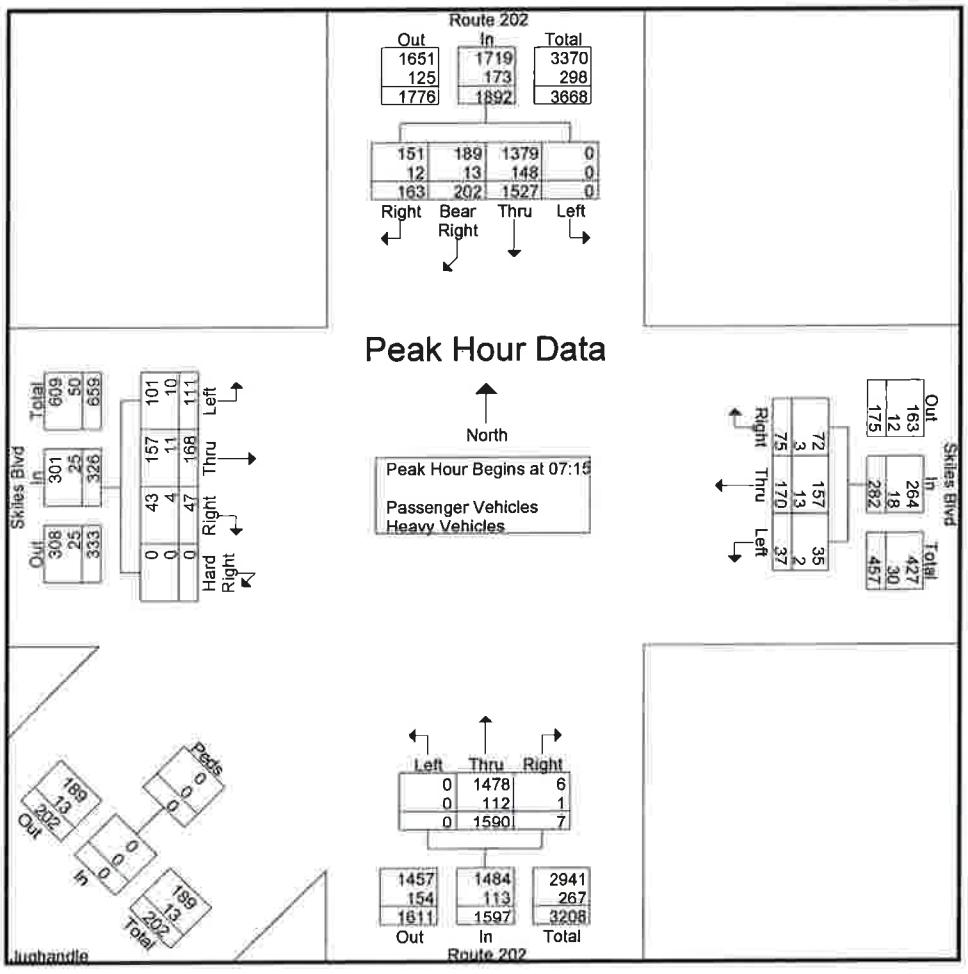
McMahon Associates, Inc.

425 Commerce Drive, Suite 200
Fort Washington, P A 19034

Municipality: Westtown Township
Location: Route 202 &
Skiles Boulevard
Counter/Board #: BW+LB

File Name : skiles01w
Site Code : 81568701
Start Date : 11/17/2015
Page No : 2

	Route 202 Southbound						Skiles Blvd Westbound					Route 202 Northbound					Jughandle Northeastbound		Skiles Blvd Eastbound					
Start Time	Left	Thru	Bear Right	ROR	Right	App Total	Left	Thru	ROR	Right	App Total	Left	Thru	ROR	Right	App Total	Peds	App Total	Left	Thru	ROR	Right	Hard Right	App Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																								
Peak Hour for Entire Intersection Begins at 07:15																								
07:15	0	**451**	**21**	**0**	**50**	**522**	**6**	**21**	**0**	**14**	**41**	**0**	**491**	**0**	**2**	**493**	0	0	11	12	0	2	0	25	1081
07:30	0	395	**93**	0	**44**	**532**	8	55	0	19	82	0	408	0	1	409	0	0	**35**	**41**	0	15	0	91	**1114**
07:45	0	312	71	0	**52**	435	**13**	**75**	0	**22**	**110**	0	328	0	2	330	0	0	31	**78**	0	**18**	0	**127**	1002
08:00	0	369	17	0	17	403	10	19	0	20	49	0	363	0	2	365	0	0	34	37	0	12	0	83	900
Total Volume		1527	202	0	163	1892		170	0	75	282	0	1590			1597			111	168	0	47	0	326	4097
% App. Total	0	80.7	10.7	0	8.6		13.1	60.3	0	26.6		0	99.6	0	0.4		0		34	51.5	0	14.4	0		
PHF	.000	.846	.543	.000	.784	.889	.712	.567	.000	.852	.641	.000	.810	.000	.875	.810	.000	.000	.793	.538	.000	.653	.000	.642	.919
Passenger Vehicles	0	1379	189	0	151	1719	35	157	0	72	264	0	1478	0	6	1484	0	0	101	157	0	43	0	301	3768
% Passenger Vehicles	0	90.3	93.6	0	92.6	90.9	94.6	92.4	0	96.0	93.6	0	93.0	0	85.7	92.9	0	0	91.0	93.5	0	91.5	0	92.3	92.0
Heavy Vehicles	0	148	13	0	12	173	2	13	0	3	18	0	112	0	1	113	0	0	10	11	0	4	0	25	329
% Heavy Vehicles															14.3										



McMahon Associates, Inc.

425 Commerce Drive, Suite 200
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Municipality: Westtown Township
Location: Route 202 &
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Site Code : 81568701
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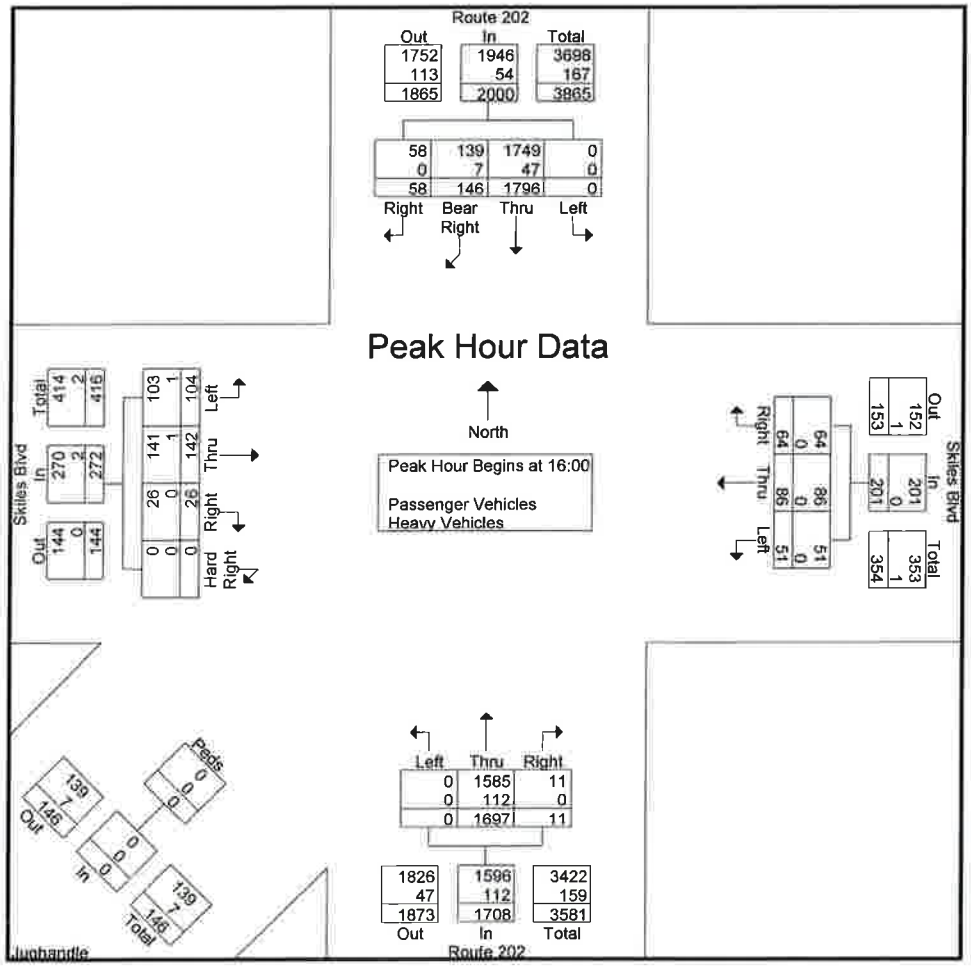
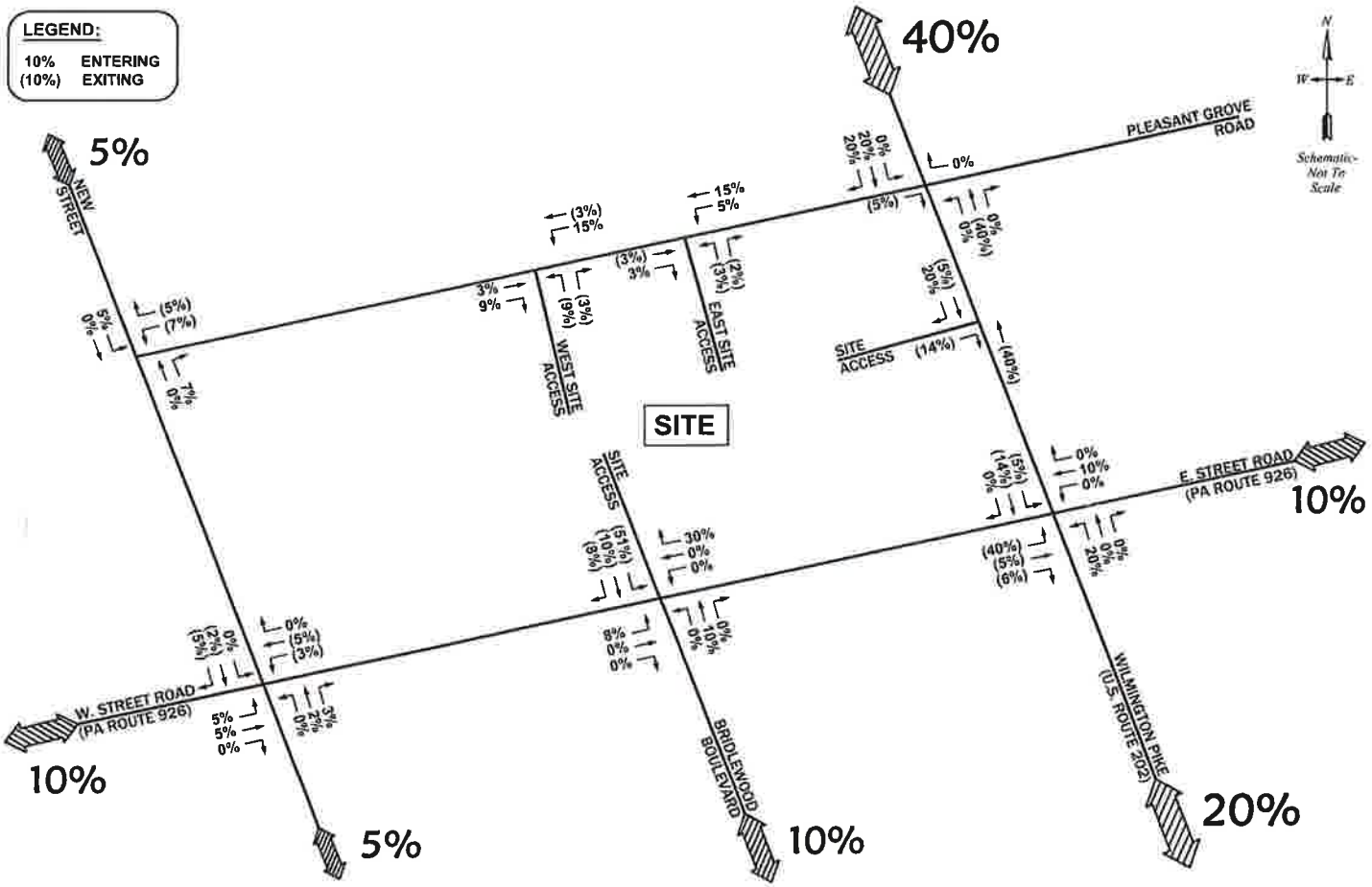
Page No : 3

	Route 202 Southbound						Skiles Blvd Westbound					Route 202 Northbound					Jughandle Northeastbound		Skiles Blvd Eastbound					
Start Time	Left	Thru	Bear Right	ROR	Right	App Total	Left	Thru	ROR	Right	App Total	Left	Thru	ROR	Right	App Total	Peds	App Total	Left	Thru	ROR	Right	Hard Right	App Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																								
Peak Hour for Entire Intersection Begins at 16:00																								
16:00	0	441	30	0	8	479	12	5	0	13	30	0	**463**	**0**	**3**	**466**	0	0	26	29	0	4	0	59	1034
16:15	0	478	20	0	**21**	519	7	**38**	0	17	62	0	437	0	1	438	0	0	16	24	0	2	0	42	1061
16:30	0	**505**	**28**	**0**	**13**	**546**	15	17	0	14	46	0	415	0	2	417	0	0	**47**	**57**	0	**12**	0	**116**	**1125**
16:45	0	372	**68**	0	16	456	**17**	**26**	0	**20**	**63**	0	382	0	**5**	387	0	0	15	32	0	8	0	55	961
Total Volume	0	1796	146	0	58	2000	51	86	0	64	201	0	1697	0	11	1708	0	0	104	142	0	26	0	272	4181
% App. Total	0	89.8	7.3	0	2.9		25.4	42.8	0	31.8		0	99.4	0	0.6		0		38.2	52.2	0	9.6	0		
PHF	.000	.889	.537	.000	.690	.916	.750	.566	.000	.800	.798	.000	.916	.000	.550	.916	.000	.000	.553	.623	.000	.542	.000	.586	.929
Passenger Vehicles	0	1749	139	0	58	1946	51	86	0	64	201	0	1585	0	11	1596	0	0	103	141	0	26	0	270	4013
% Passenger Vehicles	0	97.4	95.2	0	100	97.3	100	100	0	100	100	0	93.4	0	100	93.4	0	0	99.0	99.3	0	100	0	99.3	96.0
Heavy Vehicles													112	0	0	112	0	0	1	1	0	0	0	2	168
% Heavy Vehicles																									



ATTACHMENT 3

Comment 5



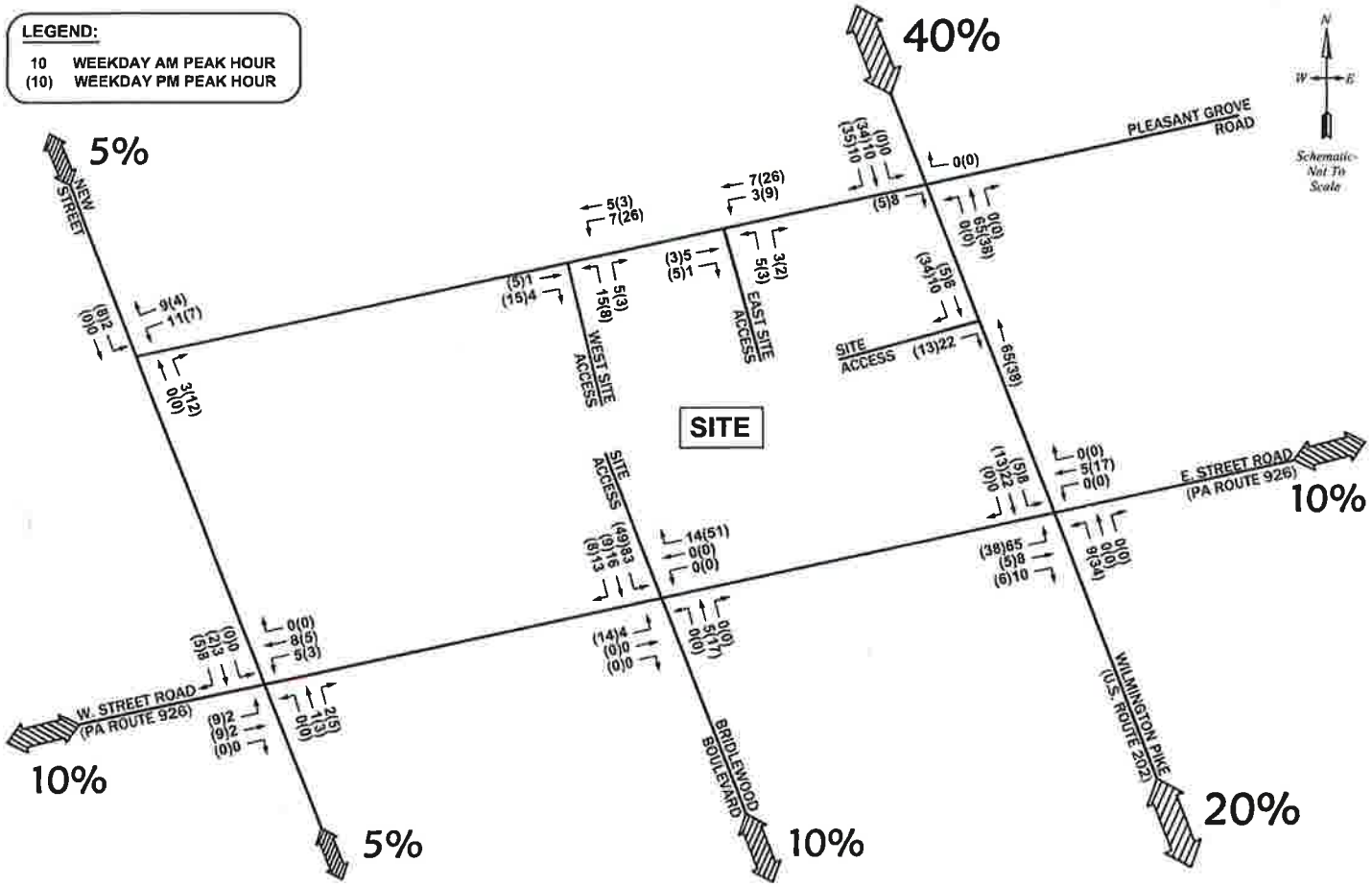
Site Trip Distribution
Alternative with Access Opposite Bridlewood Boulevard

CREBILLY FARM RESIDENTIAL DEVELOPMENT

WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

McMAHON

(3/1/2017) I:\eng\16451 - Crebilly Farm\dwg\Response to TWP Comments 2017-3-1\Alt A Trip Distribution (Access Opp Bridle).dwg



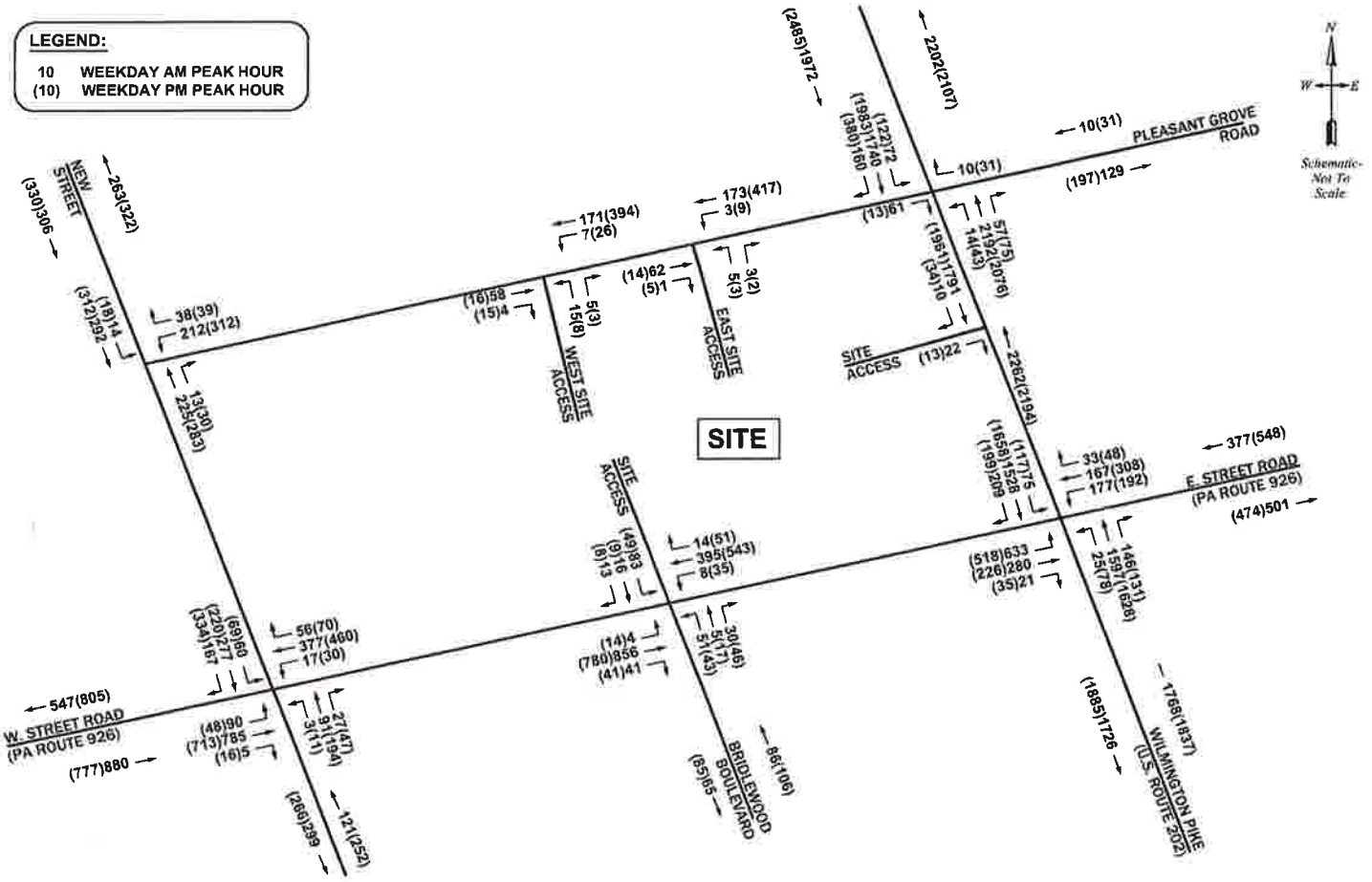
Site Trip Assignment
Alternative A with Access Opposite Bridlewood Boulevard

CREBILLY FARM RESIDENTIAL DEVELOPMENT

WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

McMAHON

(3/1/2017) I:\eng\816451 - Crebilly Farm\dwg\Response to TWP Comments 2017-3-1\Alt A Trip Assignment (Access Opp Bridle).dwg



2023 Future Peak Hour Traffic Volumes with Development
Alternative A - 317 New Units with No Traffic Diversions with Access Opposite Bridlewood Boulevard

CREBILLY FARM RESIDENTIAL DEVELOPMENT

WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

(3/1/2017) I:\eng\816451 - Crebilly Farm\dwg\Response to TWP Comments 2017-3-1\2023 Alt A Volumes (Access Opp Bridle).dwg

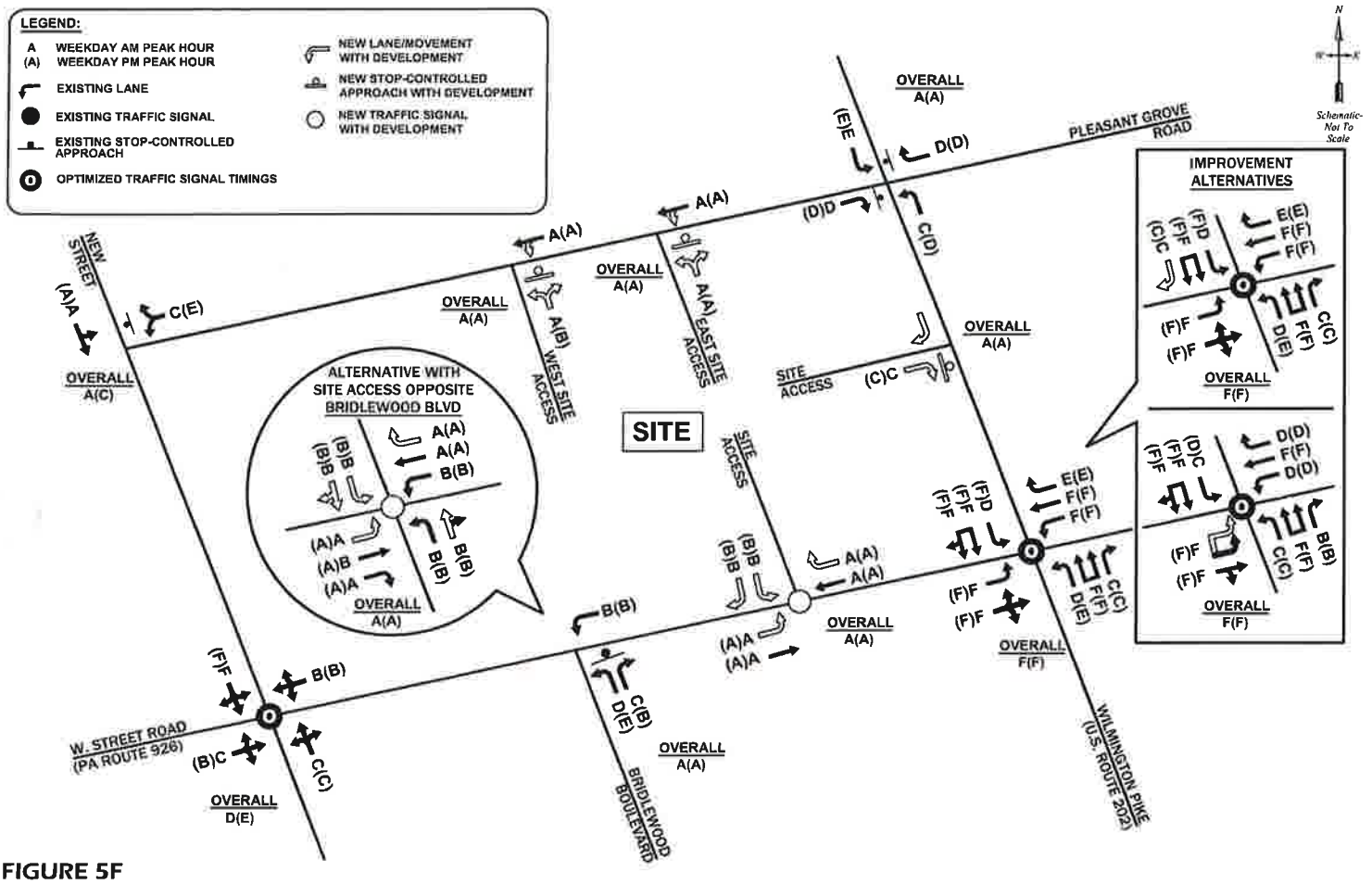


FIGURE 5F

2023 Future Peak Hour Levels of Service with Development

Alternative A - 317 New Units with No Traffic Diversions

CREBILLY FARM RESIDENTIAL DEVELOPMENT

WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

McMAHON

(1/18/2017) I:\eng\816451 - Crebilly Farm\dwg\PennDOT Twp Submission 2017-01-20\Figure 5F.dwg

INTERSECTION VOLUME SUMMARY
New Street/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD! **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component	EASTBOUND Street Rd (PA 926)			NORTHBOUND New Street			WESTBOUND Street Rd (PA 926)			SOUTHBOUND New Street		
	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	75	689	4	3	80	22	11	324	50	53	243	138
Seasonal Adjustment Factor 1.000	75	689	4	3	80	22	11	324	50	53	243	138
Balancing Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC	**75**	**689**	**4**	**3**	**80**	**22**	**11**	**324**	**50**	**53**	**243**	**138**
Background Growth 12.60 %	9	87	1	0	10	3	1	41	6	7	31	17
EXISTING W/ BACKGROUND	84	776	5	3	90	25	12	365	56	60	274	155
TOTAL "OTHER" DEVELOPMENTS	4	7	0	0	0	0	0	4	0	0	0	4
Condominium Development	0	1	0	0	0	0	0	2	0	0	0	1
Police Station Redevelopment	0	6	0	0	0	0	0	2	0	0	0	0
Arborview Development	4	0	0	0	0	0	0	0	0	0	0	3
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**88**	**783**	**5**	**3**	**90**	**25**	**12**	**369**	**56**	**60**	**274**	**159**
TOTAL "NEW" SITE TRAFFIC	**2**	**2**	**0**	**0**	**1**	**2**	**5**	**8**	**0**	**0**	**3**	**8**
Residential	2	2	0	0	1	2	5	8	0	0	3	8
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**90**	**785**	**5**	**3**	**91**	**27**	**17**	**377**	**56**	**60**	**277**	**167**
"New" Site Traffic % of Total *0.0%*	2.2	0.3	0.0	0.0	1.1	7.4	29.4	2.1	0.0	0.0	1.1	4.8

INTERSECTION VOLUME SUMMARY
New Street/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Street Rd (PA 926)			NORTHBOUND New Street			WESTBOUND Street Rd (PA 926)			SOUTHBOUND New Street		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		32	622	14	10	170	37	24	393	62	61	194	289
Seasonal Adjustment Factor	1.000	32	622	14	10	170	37	24	393	62	61	194	289
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**32**	**622**	**14**	**10**	**170**	**37**	**24**	**393**	**62**	**61**	**194**	**289**
Background Growth	12.60 %	4	78	2	1	21	5	3	50	8	8	24	36
EXISTING W/ BACKGROUND		36	700	16	11	191	42	27	443	70	69	218	325
TOTAL "OTHER" DEVELOPMENTS		3	4	0	0	0	0	0	12	0	0	0	4
Condominium Development		0	3	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment		0	1	0	0	0	0	0	11	0	0	0	0
Arborview Development		3	0	0	0	0	0	0	0	0	0	0	4
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**39**	**704**	**16**	**11**	**191**	**42**	**27**	**455**	**70**	**69**	**218**	**329**
TOTAL "NEW" SITE TRAFFIC		**9**	**9**	**0**	**0**	**3**	**5**	**3**	**5**	**0**	**0**	**2**	**5**
Residential		9	9	0	0	3	5	3	5	0	0	2	5
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**48**	**713**	**16**	**11**	**194**	**47**	**30**	**460**	**70**	**69**	**220**	**334**
"New" Site Traffic % of Total	*0.0%*	18.8	1.3	0.0	0.0	1.5	10.6	10.0	1.1	0.0	0.0	0.9	1.5

INTERSECTION VOLUME SUMMARY
Bridlewood Blvd/Site Access/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD\ **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Street Rd (PA 926)			NORTHBOUND Bridlewood Blvd/Site Access			WESTBOUND Street Rd (PA 926)			SOUTHBOUND Bridlewood Blvd/Site Access		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	754	36	45	0	27	7	347	0	0	0	0
Seasonal Adjustment Factor	1.000	0	754	36	45	0	27	7	347	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**754**	**36**	**45**	**0**	**27**	**7**	**347**	**0**	**0**	**0**	**0**
Background Growth	12.60 %	0	95	5	6	0	3	1	44	0	0	0	0
EXISTING W/ BACKGROUND		0	849	41	51	0	30	8	391	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	7	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	1	0	0	0	0	0	2	0	0	0	0
Police Station Redevelopment		0	6	0	0	0	0	0	2	0	0	0	0
Arborview Development		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**856**	**41**	**51**	**0**	**30**	**8**	**395**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**4**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**14**	**83**	**16**	**13**
Residential		4	0	0	0	5	0	0	0	14	83	16	13
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**4**	**856**	**41**	**51**	**5**	**30**	**8**	**395**	**14**	**83**	**16**	**13**
"New" Site Traffic % of Total	####	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0

INTERSECTION VOLUME SUMMARY
Bridlewood Blvd/Site Access/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND			NORTHBOUND			WESTBOUND			SOUTHBOUND	
		Street Rd (PA 926)			Bridlewood Blvd/Site Access			Street Rd (PA 926)			Bridlewood Blvd/Site Access	
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	689	36	38	0	41	31	472	0	0	0	0
Seasonal Adjustment Factor 1.000	0	689	36	38	0	41	31	472	0	0	0	0
Balancing Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC	**0**	**689**	**36**	**38**	**0**	**41**	**31**	**472**	**0**	**0**	**0**	**0**
Background Growth 12.60 %	0	87	5	5	0	5	4	59	0	0	0	0
EXISTING W/ BACKGROUND	0	776	41	43	0	46	35	531	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS	0	4	0	0	0	0	0	12	0	0	0	0
Condominium Development	0	3	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment	0	1	0	0	0	0	0	11	0	0	0	0
Arborview Development	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**780**	**41**	**43**	**0**	**46**	**35**	**543**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC	**14**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**51**	**49**	**9**	**8**
Residential	14	0	0	0	17	0	0	0	51	49	9	8
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**14**	**780**	**41**	**43**	**17**	**46**	**35**	**543**	**51**	**49**	**9**	**8**
"New" Site Traffic % of Total *10.0%*	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD\ **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

	EASTBOUND Street Rd (PA 926)			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Street Rd (PA 926)			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	498	242	10	14	1153	130	156	142	28	57	1149	184
Seasonal Adjustment Factor 1.000	498	242	10	14	1153	130	156	142	28	57	1149	184
Balancing Adjustments	0	0	0	0	244	0	0	0	0	0	180	0
ADJUSTED EXISTING TRAFFIC	**498**	**242**	**10**	**14**	**1397**	**130**	**156**	**142**	**28**	**57**	**1329**	**184**
Background Growth 12.60 %	63	30	1	2	176	16	20	18	4	7	167	23
EXISTING W/ BACKGROUND	561	272	11	16	1573	146	176	160	32	64	1496	207
TOTAL "OTHER" DEVELOPMENTS	7	0	0	0	24	0	1	2	1	3	10	2
Condominium Development	1	0	0	0	1	0	0	0	0	1	5	2
Police Station Redevelopment	6	0	0	0	15	0	1	2	0	0	0	0
Arborview Development	0	0	0	0	8	0	0	0	1	2	5	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**568**	**272**	**11**	**16**	**1597**	**146**	**177**	**162**	**33**	**67**	**1506**	**209**
TOTAL "NEW" SITE TRAFFIC	**65**	**8**	**10**	**9**	**0**	**0**	**0**	**5**	**0**	**8**	**22**	**0**
Residential	65	8	10	9	0	0	0	5	0	8	22	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**633**	**280**	**21**	**25**	**1597**	**146**	**177**	**167**	**33**	**75**	**1528**	**209**
"New" Site Traffic % of Total *0.0%*	10.3	2.9	47.6	36.0	0.0	0.0	0.0	3.0	0.0	10.7	1.4	0.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Street Rd (PA 926)			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Street Rd (PA 926)			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		423	196	26	39	1434	116	164	249	41	98	1300	176
Seasonal Adjustment Factor	1.000	423	196	26	39	1434	116	164	249	41	98	1300	176
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	151	0
ADJUSTED EXISTING TRAFFIC		**423**	**196**	**26**	**39**	**1434**	**116**	**164**	**249**	**41**	**98**	**1451**	**176**
Background Growth	12.60 %	53	25	3	5	181	15	21	31	5	12	183	22
EXISTING W/ BACKGROUND		476	221	29	44	1615	131	185	280	46	110	1634	198
TOTAL "OTHER" DEVELOPMENTS		4	0	0	0	13	0	7	11	2	2	11	1
Condominium Development		3	0	0	0	5	0	0	0	1	0	3	1
Police Station Redevelopment		1	0	0	0	3	0	7	11	0	0	0	0
Arborview Development		0	0	0	0	5	0	0	0	1	2	8	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**480**	**221**	**29**	**44**	**1628**	**131**	**192**	**291**	**48**	**112**	**1645**	**199**
TOTAL "NEW" SITE TRAFFIC		**38**	**5**	**6**	**34**	**0**	**0**	**0**	**17**	**0**	**5**	**13**	**0**
Residential		38	5	6	34	0	0	0	17	0	5	13	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**518**	**226**	**35**	**78**	**1628**	**131**	**192**	**308**	**48**	**117**	**1658**	**199**
"New" Site Traffic % of Total	*0.0%*	7.3	2.2	17.1	43.6	0.0	0.0	0.0	5.5	0.0	4.3	0.8	0.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD! **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Pleasant Grove Rd			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Pleasant Grove Rd			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	47	12	1879	32	0	0	6	46	1523	132
Seasonal Adjustment Factor	1.000	0	0	47	12	1879	32	0	0	6	46	1523	132
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**47**	**12**	**1879**	**32**	**0**	**0**	**6**	**46**	**1523**	**132**
Background Growth	12.60 %	0	0	6	2	237	4	0	0	1	6	192	17
EXISTING W/ BACKGROUND		0	0	53	14	2116	36	0	0	7	52	1715	149
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	11	21	0	0	3	20	15	1
Condominium Development		0	0	0	0	2	0	0	0	0	0	8	1
Police Station Redevelopment		0	0	0	0	0	21	0	0	3	20	0	0
Arborview Development		0	0	0	0	9	0	0	0	0	0	7	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**53**	**14**	**2127**	**57**	**0**	**0**	**10**	**72**	**1730**	**150**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**8**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**10**	**10**
Residential		0	0	8	0	65	0	0	0	0	0	10	10
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**61**	**14**	**2192**	**57**	**0**	**0**	**10**	**72**	**1740**	**160**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	13.1	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.6	6.3

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Pleasant Grove Rd			SOUTHBOUND Wilmington Pike (Rt 202)		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	7	38	2124	63	0	0	11	105	1832	306
Seasonal Adjustment Factor	1.000	0	0	7	38	2124	63	0	0	11	105	1832	306
Balancing Adjustments		0	0	0	0	-327	0	0	0	0	0	-114	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**7**	**38**	**1797**	**63**	**0**	**0**	**11**	**105**	**1718**	**306**
Background Growth	12.60 %	0	0	1	5	226	8	0	0	1	13	217	39
EXISTING W/ BACKGROUND		0	0	8	43	2023	71	0	0	12	118	1935	345
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	15	4	0	0	19	4	14	0
Condominium Development		0	0	0	0	9	0	0	0	0	0	4	0
Police Station Redevelopment		0	0	0	0	0	4	0	0	19	4	0	0
Arborview Development		0	0	0	0	6	0	0	0	0	0	10	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**8**	**43**	**2038**	**75**	**0**	**0**	**31**	**122**	**1949**	**345**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**5**	**0**	**38**	**0**	**0**	**0**	**0**	**0**	**34**	**35**
Residential		0	0	5	0	38	0	0	0	0	0	34	35
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**13**	**43**	**2076**	**75**	**0**	**0**	**31**	**122**	**1983**	**380**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	38.5	0.0	1.8	0.0	0.0	0.0	0.0	0.0	1.7	9.2

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Site Access

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SI **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

	EASTBOUND Site Access			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Site Access			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	0	0	0	1679	0	0	0	0	0	1390	0
Seasonal Adjustment Factor 1.000	0	0	0	0	1679	0	0	0	0	0	1390	0
Balancing Adjustments	0	0	0	0	244	0	0	0	0	0	180	0
ADJUSTED EXISTING TRAFFIC	**0**	**0**	**0**	**0**	**1923**	**0**	**0**	**0**	**0**	**0**	**1570**	**0**
Background Growth 12.60 %	0	0	0	0	242	0	0	0	0	0	198	0
EXISTING W/ BACKGROUNE	0	0	0	0	2165	0	0	0	0	0	1768	0
TOTAL "OTHER" DEVELOPMENTS	0	0	0	0	32	0	0	0	0	0	15	0
Condominium Development	0	0	0	0	2	0	0	0	0	0	8	0
Police Station Redevelopment	0	0	0	0	21	0	0	0	0	0	0	0
Arborview Development	0	0	0	0	9	0	0	0	0	0	7	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**0**	**0**	**0**	**2197**	**0**	**0**	**0**	**0**	**0**	**1783**	**0**
TOTAL "NEW" SITE TRAFFIC	**0**	**0**	**22**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**8**	**10**
Residential	0	0	22	0	65	0	0	0	0	0	8	10
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**0**	**0**	**22**	**0**	**2262**	**0**	**0**	**0**	**0**	**0**	**1791**	**10**
"New" Site Traffic % of Total *0.0%*	0.0	0.0	100.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.4	100.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Site Access

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Site Access			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Site Access			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	0	0	1898	0	0	0	0	0	1574	0
Seasonal Adjustment Factor	1.000	0	0	0	0	1898	0	0	0	0	0	1574	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	151	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**0**	**0**	**1898**	**0**	**0**	**0**	**0**	**0**	**1725**	**0**
Background Growth	12.60 %	0	0	0	0	239	0	0	0	0	0	217	0
EXISTING W/ BACKGROUNE		0	0	0	0	2137	0	0	0	0	0	1942	0
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	19	0	0	0	0	0	14	0
Condominium Development		0	0	0	0	9	0	0	0	0	0	4	0
Police Station Redevelopment		0	0	0	0	4	0	0	0	0	0	0	0
Arborview Development		0	0	0	0	6	0	0	0	0	0	10	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**0**	**0**	**2156**	**0**	**0**	**0**	**0**	**0**	**1956**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**13**	**0**	**38**	**0**	**0**	**0**	**0**	**0**	**5**	**34**
Residential		0	0	13	0	38	0	0	0	0	0	5	34
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**13**	**0**	**2194**	**0**	**0**	**0**	**0**	**0**	**1961**	**34**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	100.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.3	100.0

INTERSECTION VOLUME SUMMARY
West Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SL **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

	EASTBOUND Pleasant Grove Rd			NORTHBOUND West Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND West Site Access		
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	47	0	0	0	0	0	144	0	0	0	0
Seasonal Adjustment Factor 1.000	0	47	0	0	0	0	0	144	0	0	0	0
Balancing Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC	**0**	**47**	**0**	**0**	**0**	**0**	**0**	**144**	**0**	**0**	**0**	**0**
Background Growth 12.60 %	0	6	0	0	0	0	0	18	0	0	0	0
EXISTING W/ BACKGROUND	0	53	0	0	0	0	0	162	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS	0	4	0	0	0	0	0	4	0	0	0	0
Condominium Development	0	0	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment	0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development	0	4	0	0	0	0	0	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**57**	**0**	**0**	**0**	**0**	**0**	**166**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC	**0**	**1**	**4**	**15**	**0**	**5**	**7**	**5**	**0**	**0**	**0**	**0**
Residential	0	1	4	15	0	5	7	5	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**0**	**58**	**4**	**15**	**0**	**5**	**7**	**171**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total ####	0.0	1.7	100.0	100.0	0.0	100.0	100.0	2.9	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
West Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Pleasant Grove Rd			NORTHBOUND West Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND West Site Access		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	7	0	0	0	0	0	344	0	0	0	0
Seasonal Adjustment Factor	1.000	0	7	0	0	0	0	0	344	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**7**	**0**	**0**	**0**	**0**	**0**	**344**	**0**	**0**	**0**	**0**
Background Growth	12.60 %	0	1	0	0	0	0	0	43	0	0	0	0
EXISTING W/ BACKGROUNE		0	8	0	0	0	0	0	387	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	3	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	3	0	0	0	0	0	4	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**11**	**0**	**0**	**0**	**0**	**0**	**391**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**5**	**15**	**8**	**0**	**3**	**26**	**3**	**0**	**0**	**0**	**0**
Residential		0	5	15	8	0	3	26	3	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**16**	**15**	**8**	**0**	**3**	**26**	**394**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total	####	0.0	31.3	100.0	100.0	0.0	100.0	100.0	0.8	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
East Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

	EASTBOUND Pleasant Grove Rd			NORTHBOUND East Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND East Site Access		
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	47	0	0	0	0	0	144	0	0	0	0
Seasonal Adjustment Factor 1.000	0	47	0	0	0	0	0	144	0	0	0	0
Balancing Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC	**0**	**47**	**0**	**0**	**0**	**0**	**0**	**144**	**0**	**0**	**0**	**0**
Background Growth 12.60 %	0	6	0	0	0	0	0	18	0	0	0	0
EXISTING W/ BACKGROUND	0	53	0	0	0	0	0	162	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS	0	4	0	0	0	0	0	4	0	0	0	0
Condominium Development	0	0	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment	0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development	0	4	0	0	0	0	0	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**57**	**0**	**0**	**0**	**0**	**0**	**166**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC	**0**	**5**	**1**	**5**	**0**	**3**	**3**	**7**	**0**	**0**	**0**	**0**
Residential	0	5	1	5	0	3	3	7	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**0**	**62**	**1**	**5**	**0**	**3**	**3**	**173**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total *10.0%*	0.0	8.1	100.0	100.0	0.0	100.0	100.0	4.0	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
East Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND East Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND East Site Access		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	7	0	0	0	0	0	344	0	0	0	0
Seasonal Adjustment Factor	1.000	0	7	0	0	0	0	0	344	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**7**	**0**	**0**	**0**	**0**	**0**	**344**	**0**	**0**	**0**	**0**
Background Growth	12.60 %	0	1	0	0	0	0	0	43	0	0	0	0
EXISTING W/ BACKGROUND		0	8	0	0	0	0	0	387	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	3	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	3	0	0	0	0	0	4	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**11**	**0**	**0**	**0**	**0**	**0**	**391**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**3**	**5**	**3**	**0**	**2**	**9**	**26**	**0**	**0**	**0**	**0**
Residential		0	3	5	3	0	2	9	26	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**14**	**5**	**3**	**0**	**2**	**9**	**417**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total	*10.0%*	0.0	21.4	100.0	100.0	0.0	100.0	100.0	6.2	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
New Street/Pleasant Grove Rd

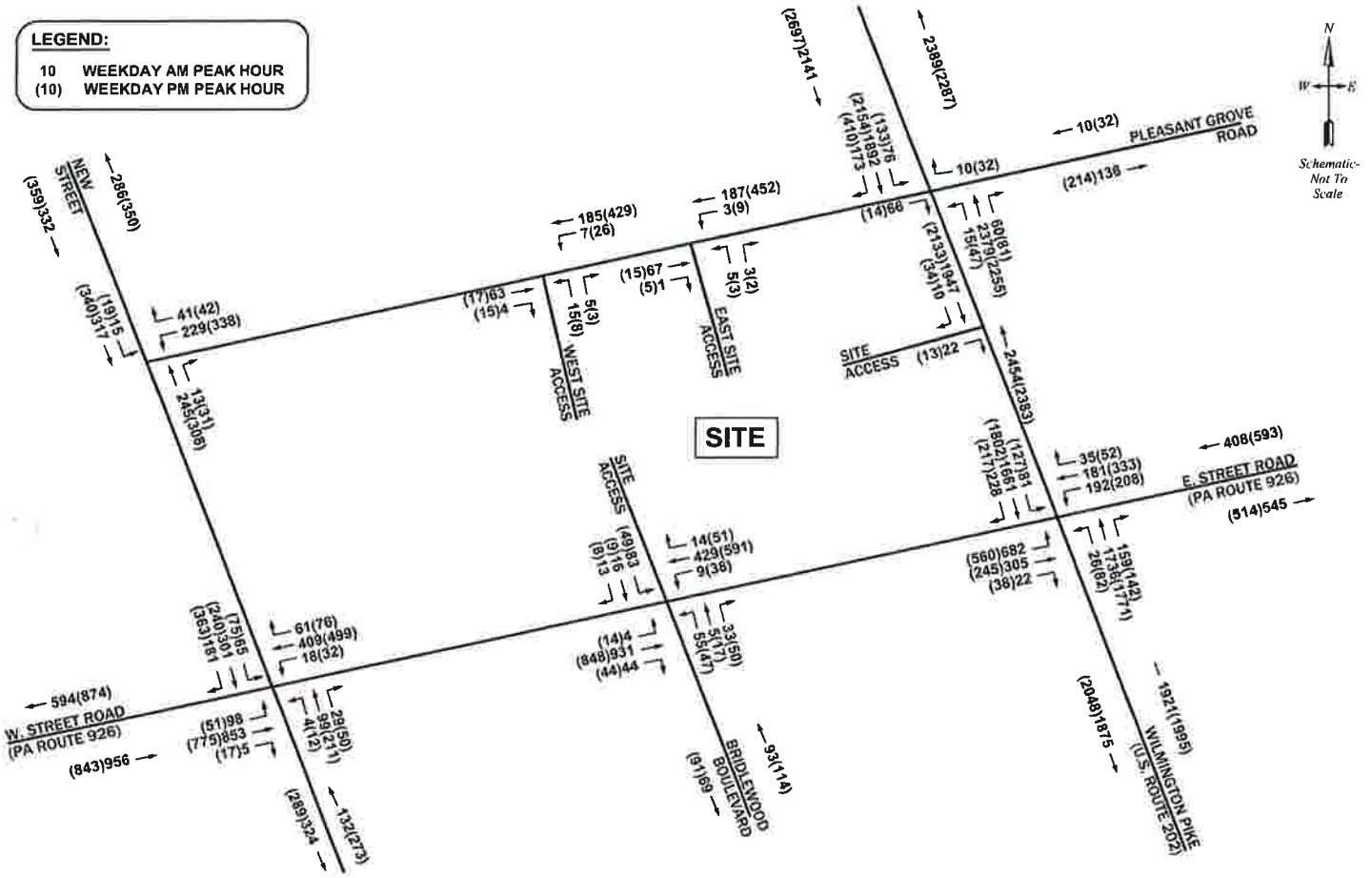
Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SE **Weekday 7-9 AM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND New Street			WESTBOUND Pleasant Grove Rd			SOUTHBOUND New Street		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	0	0	141	5	142	0	26	11	129	0
Seasonal Adjustment Factor	1.000	0	0	0	0	141	5	142	0	26	11	129	0
Balancing Adjustments		0	0	0	0	59	0	33	0	0	0	130	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**0**	**0**	**200**	**5**	**175**	**0**	**26**	**11**	**259**	**0**
Background Growth	12.60 %	0	0	0	0	25	1	22	0	3	1	33	0
EXISTING W/ BACKGROUND		0	0	0	0	225	6	197	0	29	12	292	0
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	0	4	4	0	0	0	0	0
Condominium Development		0	0	0	0	0	0	1	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	0	0	0	0	4	3	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**0**	**0**	**225**	**10**	**201**	**0**	**29**	**12**	**292**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**0**	**0**	**0**	**3**	**11**	**0**	**9**	**2**	**0**	**0**
Residential		0	0	0	0	0	3	11	0	9	2	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**0**	**0**	**225**	**13**	**212**	**0**	**38**	**14**	**292**	**0**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	0.0	0.0	0.0	23.1	5.2	0.0	23.7	14.3	0.0	0.0

INTERSECTION VOLUME SUMMARY
New Street/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 4-6 PM**
Build-Out Year 2023 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND New Street			WESTBOUND Pleasant Grove Rd			SOUTHBOUND New Street		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	0	0	103	13	231	0	31	9	133	0
Seasonal Adjustment Factor	1.000	0	0	0	0	103	13	231	0	31	9	133	0
Balancing Adjustments		0	0	0	0	148	0	36	0	0	0	144	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**0**	**0**	**251**	**13**	**267**	**0**	**31**	**9**	**277**	**0**
Background Growth	12.60 %	0	0	0	0	32	2	34	0	4	1	35	0
EXISTING W/ BACKGROUND		0	0	0	0	283	15	301	0	35	10	312	0
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	0	3	4	0	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	0	0	0	0	3	4	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/OUT PROJECT		**0**	**0**	**0**	**0**	**283**	**18**	**305**	**0**	**35**	**10**	**312**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**0**	**0**	**0**	**12**	**7**	**0**	**4**	**8**	**0**	**0**
Residential		0	0	0	0	0	12	7	0	4	8	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**0**	**0**	**283**	**30**	**312**	**0**	**39**	**18**	**312**	**0**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	0.0	0.0	0.0	40.0	2.2	0.0	10.3	44.4	0.0	0.0



2028 Future Peak Hour Traffic Volumes with Development
Alternative A - 317 New Units with No Traffic Diversions with Access Opposite Bridlewood Boulevard

CREBILLY FARM RESIDENTIAL DEVELOPMENT

WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

(3/1/2017) I:\eng\816451 - Crebilly Farm\dwg\Response to TWP Comments 2017-3-1\2028 Alt A Volumes (Access Opp Bridle).dwg

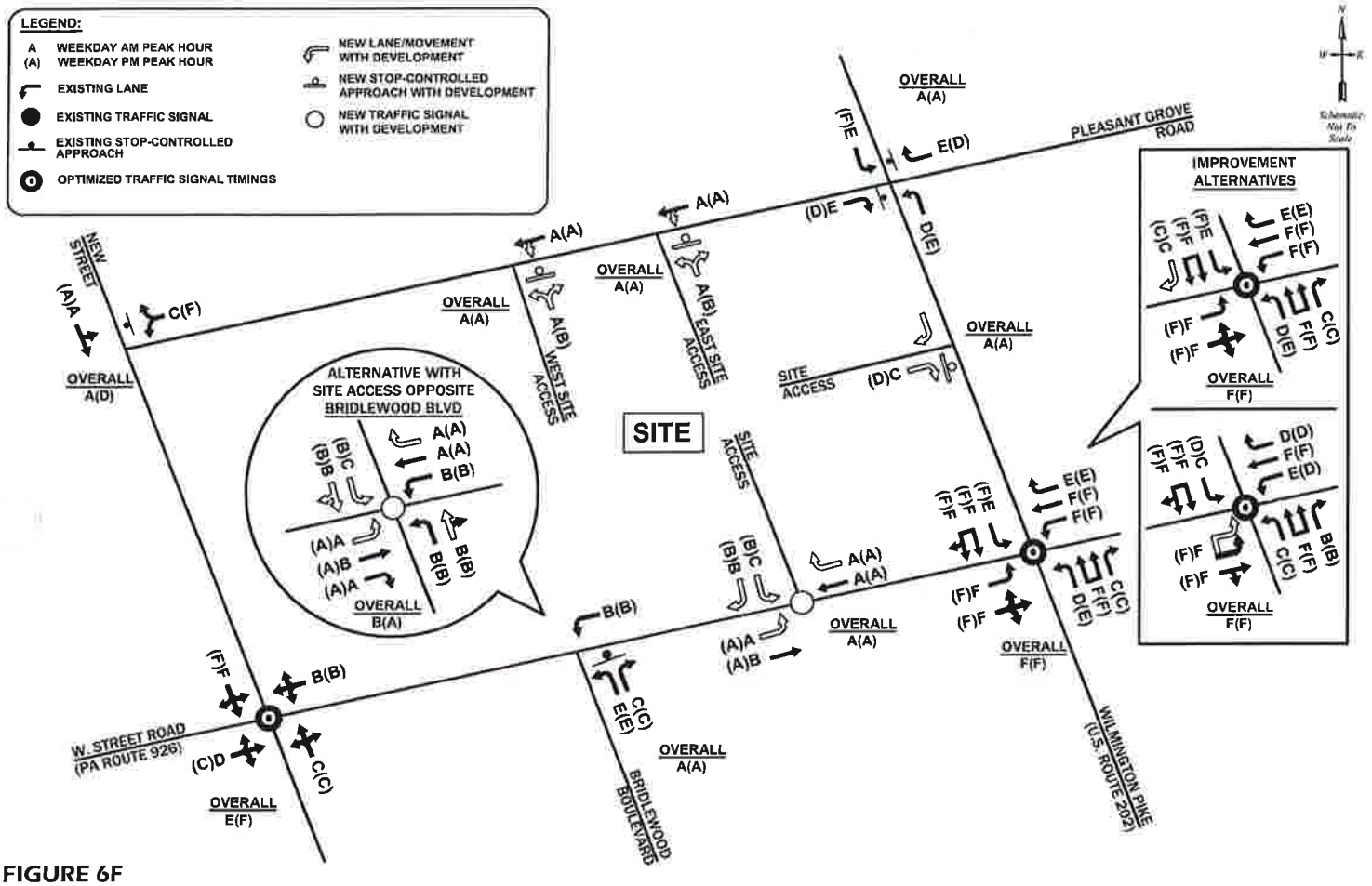


FIGURE 6F

2028 Future Peak Hour Levels of Service with Development

Alternative A - 317 New Units with No Traffic Diversions

CREBILLY FARM RESIDENTIAL DEVELOPMENT

WESTTOWN TOWNSHIP, CHESTER COUNTY, PA

McMAHON

(1/18/2017) I:\eng\816451 - Crebilly Farm\dwg\PennDOT Twp Submission 2017-01-20\Figure 6F.dwg

INTERSECTION VOLUME SUMMARY
New Street/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Street Rd (PA 926)			NORTHBOUND New Street			WESTBOUND Street Rd (PA 926)			SOUTHBOUND New Street		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		75	689	4	3	80	22	11	324	50	53	243	138
Seasonal Adjustment Factor	1.000	75	689	4	3	80	22	11	324	50	53	243	138
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**75**	**689**	**4**	**3**	**80**	**22**	**11**	**324**	**50**	**53**	**243**	**138**
Background Growth	22.56 %	17	155	1	1	18	5	2	73	11	12	55	31
EXISTING W/ BACKGROUND		92	844	5	4	98	27	13	397	61	65	298	169
TOTAL "OTHER" DEVELOPMENTS		4	7	0	0	0	0	0	4	0	0	0	4
Condominium Development		0	1	0	0	0	0	0	2	0	0	0	1
Police Station Redevelopment		0	6	0	0	0	0	0	2	0	0	0	0
Arborview Development		4	0	0	0	0	0	0	0	0	0	0	3
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**96**	**851**	**5**	**4**	**98**	**27**	**13**	**401**	**61**	**65**	**298**	**173**
TOTAL "NEW" SITE TRAFFIC		**2**	**2**	**0**	**0**	**1**	**2**	**5**	**8**	**0**	**0**	**3**	**8**
Residential		2	2	0	0	1	2	5	8	0	0	3	8
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**98**	**853**	**5**	**4**	**99**	**29**	**18**	**409**	**61**	**65**	**301**	**181**
"New" Site Traffic % of Total	*0.0%*	2.0	0.2	0.0	0.0	1.0	6.9	27.8	2.0	0.0	0.0	1.0	4.4

INTERSECTION VOLUME SUMMARY
New Street/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Street Rd (PA 926)			NORTHBOUND New Street			WESTBOUND Street Rd (PA 926)			SOUTHBOUND New Street		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		32	622	14	10	170	37	24	393	62	61	194	289
Seasonal Adjustment Factor	1.000	32	622	14	10	170	37	24	393	62	61	194	289
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**32**	**622**	**14**	**10**	**170**	**37**	**24**	**393**	**62**	**61**	**194**	**289**
Background Growth	22.56 %	7	140	3	2	38	8	5	89	14	14	44	65
EXISTING W/ BACKGROUND		39	762	17	12	208	45	29	482	76	75	238	354
TOTAL "OTHER" DEVELOPMENTS		3	4	0	0	0	0	0	12	0	0	0	4
Condominium Development		0	3	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment		0	1	0	0	0	0	0	11	0	0	0	0
Arborview Development		3	0	0	0	0	0	0	0	0	0	0	4
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**42**	**766**	**17**	**12**	**208**	**45**	**29**	**494**	**76**	**75**	**238**	**358**
TOTAL "NEW" SITE TRAFFIC		**9**	**9**	**0**	**0**	**3**	**5**	**3**	**5**	**0**	**0**	**2**	**5**
Residential		9	9	0	0	3	5	3	5	0	0	2	5
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**51**	**775**	**17**	**12**	**211**	**50**	**32**	**499**	**76**	**75**	**240**	**363**
"New" Site Traffic % of Total	*0.0%*	17.6	1.2	0.0	0.0	1.4	10.0	9.4	1.0	0.0	0.0	0.8	1.4

INTERSECTION VOLUME SUMMARY
Bridlewood Blvd/Site Access/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD\ **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND			NORTHBOUND			WESTBOUND			SOUTHBOUND		
		Street Rd (PA 926)			Bridlewood Blvd/Site Access			Street Rd (PA 926)			Bridlewood Blvd/Site Access		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	754	36	45	0	27	7	347	0	0	0	0
Seasonal Adjustment Factor	1.000	0	754	36	45	0	27	7	347	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**754**	**36**	**45**	**0**	**27**	**7**	**347**	**0**	**0**	**0**	**0**
Background Growth	22.56 %	0	170	8	10	0	6	2	78	0	0	0	0
EXISTING W/ BACKGROUND		0	924	44	55	0	33	9	425	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	7	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	1	0	0	0	0	0	2	0	0	0	0
Police Station Redevelopment		0	6	0	0	0	0	0	2	0	0	0	0
Arborview Development		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**931**	**44**	**55**	**0**	**33**	**9**	**429**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**4**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**14**	**83**	**16**	**13**
Residential		4	0	0	0	5	0	0	0	14	83	16	13
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**4**	**931**	**44**	**55**	**5**	**33**	**9**	**429**	**14**	**83**	**16**	**13**
"New" Site Traffic % of Total	####	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0

INTERSECTION VOLUME SUMMARY
Bridlewood Blvd/Site Access/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Street Rd (PA 926)			NORTHBOUND Bridlewood Blvd/Site Access			WESTBOUND Street Rd (PA 926)			SOUTHBOUND Bridlewood Blvd/Site Access		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	689	36	38	0	41	31	472	0	0	0	0
Seasonal Adjustment Factor	1.000	0	689	36	38	0	41	31	472	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**689**	**36**	**38**	**0**	**41**	**31**	**472**	**0**	**0**	**0**	**0**
Background Growth	22.56 %	0	155	8	9	0	9	7	107	0	0	0	0
EXISTING W/ BACKGROUND		0	844	44	47	0	50	38	579	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	4	0	0	0	0	0	12	0	0	0	0
Condominium Development		0	3	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment		0	1	0	0	0	0	0	11	0	0	0	0
Arborview Development		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**848**	**44**	**47**	**0**	**50**	**38**	**591**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**14**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**51**	**49**	**9**	**8**
Residential		14	0	0	0	17	0	0	0	51	49	9	8
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**14**	**848**	**44**	**47**	**17**	**50**	**38**	**591**	**51**	**49**	**9**	**8**
"New" Site Traffic % of Total	*10.0%*	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD: **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Street Rd (PA 926)			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Street Rd (PA 926)			SOUTHBOUND Wilmington Pike (Rt 202)		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		498	242	10	14	1153	130	156	142	28	57	1149	184
Seasonal Adjustment Factor	1.000	498	242	10	14	1153	130	156	142	28	57	1149	184
Balancing Adjustments		0	0	0	0	244	0	0	0	0	0	180	0
ADJUSTED EXISTING TRAFFIC		**498**	**242**	**10**	**14**	**1397**	**130**	**156**	**142**	**28**	**57**	**1329**	**184**
Background Growth	22.56 %	112	55	2	3	315	29	35	32	6	13	300	42
EXISTING W/ BACKGROUND		610	297	12	17	1712	159	191	174	34	70	1629	226
TOTAL "OTHER" DEVELOPMENTS		7	0	0	0	24	0	1	2	1	3	10	2
Condominium Development		1	0	0	0	1	0	0	0	0	1	5	2
Police Station Redevelopment		6	0	0	0	15	0	1	2	0	0	0	0
Arborview Development		0	0	0	0	8	0	0	0	1	2	5	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**617**	**297**	**12**	**17**	**1736**	**159**	**192**	**176**	**35**	**73**	**1639**	**228**
TOTAL "NEW" SITE TRAFFIC		**65**	**8**	**10**	**9**	**0**	**0**	**0**	**5**	**0**	**8**	**22**	**0**
Residential		65	8	10	9	0	0	0	5	0	8	22	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**682**	**305**	**22**	**26**	**1736**	**159**	**192**	**181**	**35**	**81**	**1661**	**228**
"New" Site Traffic % of Total	*0.0%*	9.5	2.6	45.5	34.6	0.0	0.0	0.0	2.8	0.0	9.9	1.3	0.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Street Rd (PA 926)

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Street Rd (PA 926)			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Street Rd (PA 926)			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		423	196	26	39	1434	116	164	249	41	98	1300	176
Seasonal Adjustment Factor	1.000	423	196	26	39	1434	116	164	249	41	98	1300	176
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	151	0
ADJUSTED EXISTING TRAFFIC		**423**	**196**	**26**	**39**	**1434**	**116**	**164**	**249**	**41**	**98**	**1451**	**176**
Background Growth	22.56 %	95	44	6	9	324	26	37	56	9	22	327	40
EXISTING W/ BACKGROUND		518	240	32	48	1758	142	201	305	50	120	1778	216
TOTAL "OTHER" DEVELOPMENTS		4	0	0	0	13	0	7	11	2	2	11	1
Condominium Development		3	0	0	0	5	0	0	0	1	0	3	1
Police Station Redevelopment		1	0	0	0	3	0	7	11	0	0	0	0
Arborview Development		0	0	0	0	5	0	0	0	1	2	8	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**522**	**240**	**32**	**48**	**1771**	**142**	**208**	**316**	**52**	**122**	**1789**	**217**
TOTAL "NEW" SITE TRAFFIC		**38**	**5**	**6**	**34**	**0**	**0**	**0**	**17**	**0**	**5**	**13**	**0**
Residential		38	5	6	34	0	0	0	17	0	5	13	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**560**	**245**	**38**	**82**	**1771**	**142**	**208**	**333**	**52**	**127**	**1802**	**217**
"New" Site Traffic % of Total	*0.0%*	6.8	2.0	15.8	41.5	0.0	0.0	0.0	5.1	0.0	3.9	0.7	0.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD\ **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Pleasant Grove Rd			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Pleasant Grove Rd			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	47	12	1879	32	0	0	6	46	1523	132
Seasonal Adjustment Factor	1.000	0	0	47	12	1879	32	0	0	6	46	1523	132
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**47**	**12**	**1879**	**32**	**0**	**0**	**6**	**46**	**1523**	**132**
Background Growth	22.56 %	0	0	11	3	424	7	0	0	1	10	344	30
EXISTING W/ BACKGROUND		0	0	58	15	2303	39	0	0	7	56	1867	162
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	11	21	0	0	3	20	15	1
Condominium Development		0	0	0	0	2	0	0	0	0	0	8	1
Police Station Redevelopment		0	0	0	0	0	21	0	0	3	20	0	0
Arborview Development		0	0	0	0	9	0	0	0	0	0	7	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**58**	**15**	**2314**	**60**	**0**	**0**	**10**	**76**	**1882**	**163**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**8**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**10**	**10**
Residential		0	0	8	0	65	0	0	0	0	0	10	10
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**66**	**15**	**2379**	**60**	**0**	**0**	**10**	**76**	**1892**	**173**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	12.1	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.5	5.8

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Pleasant Grove Rd			SOUTHBOUND Wilmington Pike (Rt 202)		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	7	38	2124	63	0	0	11	105	1832	306
Seasonal Adjustment Factor	1.000	0	0	7	38	2124	63	0	0	11	105	1832	306
Balancing Adjustments		0	0	0	0	-327	0	0	0	0	0	-114	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**7**	**38**	**1797**	**63**	**0**	**0**	**11**	**105**	**1718**	**306**
Background Growth	22.56 %	0	0	2	9	405	14	0	0	2	24	388	69
EXISTING W/ BACKGROUND		0	0	9	47	2202	77	0	0	13	129	2106	375
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	15	4	0	0	19	4	14	0
Condominium Development		0	0	0	0	9	0	0	0	0	0	4	0
Police Station Redevelopment		0	0	0	0	0	4	0	0	19	4	0	0
Arborview Development		0	0	0	0	6	0	0	0	0	0	10	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**9**	**47**	**2217**	**81**	**0**	**0**	**32**	**133**	**2120**	**375**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**5**	**0**	**38**	**0**	**0**	**0**	**0**	**0**	**34**	**35**
Residential		0	0	5	0	38	0	0	0	0	0	34	35
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**14**	**47**	**2255**	**81**	**0**	**0**	**32**	**133**	**2154**	**410**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	35.7	0.0	1.7	0.0	0.0	0.0	0.0	0.0	1.6	8.5

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Site Access

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SE **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

	EASTBOUND Site Access			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Site Access			SOUTHBOUND Wilmington Pike (Rt 202)		
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	0	0	0	1679	0	0	0	0	0	1390	0
Seasonal Adjustment Factor 1.000	0	0	0	0	1679	0	0	0	0	0	1390	0
Balancing Adjustments	0	0	0	0	244	0	0	0	0	0	180	0
ADJUSTED EXISTING TRAFFIC	**0**	**0**	**0**	**0**	**1923**	**0**	**0**	**0**	**0**	**0**	**1570**	**0**
Background Growth 22.56 %	0	0	0	0	434	0	0	0	0	0	354	0
EXISTING W/ BACKGROUND	0	0	0	0	2357	0	0	0	0	0	1924	0
TOTAL "OTHER" DEVELOPMENTS	0	0	0	0	32	0	0	0	0	0	15	0
Condominium Development	0	0	0	0	2	0	0	0	0	0	8	0
Police Station Redevelopment	0	0	0	0	21	0	0	0	0	0	0	0
Arborview Development	0	0	0	0	9	0	0	0	0	0	7	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**0**	**0**	**0**	**2389**	**0**	**0**	**0**	**0**	**0**	**1939**	**0**
TOTAL "NEW" SITE TRAFFIC	**0**	**0**	**22**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**8**	**10**
Residential	0	0	22	0	65	0	0	0	0	0	8	10
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**0**	**0**	**22**	**0**	**2454**	**0**	**0**	**0**	**0**	**0**	**1947**	**10**
"New" Site Traffic % of Total *0.0%*	0.0	0.0	100.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.4	100.0

INTERSECTION VOLUME SUMMARY
Wilmington Pike (Rt 202)/Site Access

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Site Access			NORTHBOUND Wilmington Pike (Rt 202)			WESTBOUND Site Access			SOUTHBOUND Wilmington Pike (Rt 202)		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	0	0	1898	0	0	0	0	0	1574	0
Seasonal Adjustment Factor	1.000	0	0	0	0	1898	0	0	0	0	0	1574	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	151	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**0**	**0**	**1898**	**0**	**0**	**0**	**0**	**0**	**1725**	**0**
Background Growth	22.56 %	0	0	0	0	428	0	0	0	0	0	389	0
EXISTING W/ BACKGROUNE		0	0	0	0	2326	0	0	0	0	0	2114	0
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	19	0	0	0	0	0	14	0
Condominium Development		0	0	0	0	9	0	0	0	0	0	4	0
Police Station Redevelopment		0	0	0	0	4	0	0	0	0	0	0	0
Arborview Development		0	0	0	0	6	0	0	0	0	0	10	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**0**	**0**	**0**	**2345**	**0**	**0**	**0**	**0**	**0**	**2128**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**13**	**0**	**38**	**0**	**0**	**0**	**0**	**0**	**5**	**34**
Residential		0	0	13	0	38	0	0	0	0	0	5	34
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**13**	**0**	**2383**	**0**	**0**	**0**	**0**	**0**	**2133**	**34**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	100.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.2	100.0

INTERSECTION VOLUME SUMMARY
West Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SE **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component	EASTBOUND Pleasant Grove Rd			NORTHBOUND West Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND West Site Access		
	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	47	0	0	0	0	0	144	0	0	0	0
Seasonal Adjustment Factor 1.000	0	47	0	0	0	0	0	144	0	0	0	0
Balancing Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC	**0**	**47**	**0**	**0**	**0**	**0**	**0**	**144**	**0**	**0**	**0**	**0**
Background Growth 22.56 %	0	11	0	0	0	0	0	32	0	0	0	0
EXISTING W/ BACKGROUND	0	58	0	0	0	0	0	176	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS	0	4	0	0	0	0	0	4	0	0	0	0
Condominium Development	0	0	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment	0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development	0	4	0	0	0	0	0	3	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**62**	**0**	**0**	**0**	**0**	**0**	**180**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC	**0**	**1**	**4**	**15**	**0**	**5**	**7**	**5**	**0**	**0**	**0**	**0**
Residential	0	1	4	15	0	5	7	5	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**0**	**63**	**4**	**15**	**0**	**5**	**7**	**185**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total ####	0.0	1.6	100.0	100.0	0.0	100.0	100.0	2.7	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
West Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND West Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND West Site Access		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	7	0	0	0	0	0	344	0	0	0	0
Seasonal Adjustment Factor	1.000	0	7	0	0	0	0	0	344	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**7**	**0**	**0**	**0**	**0**	**0**	**344**	**0**	**0**	**0**	**0**
Background Growth	22.56 %	0	2	0	0	0	0	0	78	0	0	0	0
EXISTING W/ BACKGROUNE		0	9	0	0	0	0	0	422	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	3	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	3	0	0	0	0	0	4	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**12**	**0**	**0**	**0**	**0**	**0**	**426**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**5**	**15**	**8**	**0**	**3**	**26**	**3**	**0**	**0**	**0**	**0**
Residential		0	5	15	8	0	3	26	3	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**17**	**15**	**8**	**0**	**3**	**26**	**429**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total	####	0.0	29.4	100.0	100.0	0.0	100.0	100.0	0.7	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
East Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND East Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND East Site Access		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	47	0	0	0	0	0	144	0	0	0	0
Seasonal Adjustment Factor	1.000	0	47	0	0	0	0	0	144	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**47**	**0**	**0**	**0**	**0**	**0**	**144**	**0**	**0**	**0**	**0**
Background Growth	22.56 %	0	11	0	0	0	0	0	32	0	0	0	0
EXISTING W/ BACKGROUND		0	58	0	0	0	0	0	176	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	4	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	1	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	4	0	0	0	0	0	3	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**62**	**0**	**0**	**0**	**0**	**0**	**180**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**5**	**1**	**5**	**0**	**3**	**3**	**7**	**0**	**0**	**0**	**0**
Residential		0	5	1	5	0	3	3	7	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**67**	**1**	**5**	**0**	**3**	**3**	**187**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total	*10.0%*	0.0	7.5	100.0	100.0	0.0	100.0	100.0	3.7	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
East Site Access/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SDS **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

Traffic Component		EASTBOUND Pleasant Grove Rd			NORTHBOUND East Site Access			WESTBOUND Pleasant Grove Rd			SOUTHBOUND East Site Access		
		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	7	0	0	0	0	0	344	0	0	0	0
Seasonal Adjustment Factor	1.000	0	7	0	0	0	0	0	344	0	0	0	0
Balancing Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
ADJUSTED EXISTING TRAFFIC		**0**	**7**	**0**	**0**	**0**	**0**	**0**	**344**	**0**	**0**	**0**	**0**
Background Growth	22.56 %	0	2	0	0	0	0	0	78	0	0	0	0
EXISTING W/ BACKGROUND		0	9	0	0	0	0	0	422	0	0	0	0
TOTAL "OTHER" DEVELOPMENTS		0	3	0	0	0	0	0	4	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	3	0	0	0	0	0	4	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT		**0**	**12**	**0**	**0**	**0**	**0**	**0**	**426**	**0**	**0**	**0**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**3**	**5**	**3**	**0**	**2**	**9**	**26**	**0**	**0**	**0**	**0**
Residential		0	3	5	3	0	2	9	26	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**15**	**5**	**3**	**0**	**2**	**9**	**452**	**0**	**0**	**0**	**0**
"New" Site Traffic % of Total	*10.0%*	0.0	20.0	100.0	100.0	0.0	100.0	100.0	5.8	0.0	0.0	0.0	0.0

INTERSECTION VOLUME SUMMARY
New Street/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SI **Weekday 7-9 AM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

	EASTBOUND Pleasant Grove Rd			NORTHBOUND New Street			WESTBOUND Pleasant Grove Rd			SOUTHBOUND New Street		
Traffic Component	L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC	0	0	0	0	141	5	142	0	26	11	129	0
Seasonal Adjustment Factor 1.000	0	0	0	0	141	5	142	0	26	11	129	0
Balancing Adjustments	0	0	0	0	59	0	33	0	0	0	130	0
ADJUSTED EXISTING TRAFFIC	**0**	**0**	**0**	**0**	**200**	**5**	**175**	**0**	**26**	**11**	**259**	**0**
Background Growth 22.56 %	0	0	0	0	45	1	39	0	6	2	58	0
EXISTING W/ BACKGROUND	0	0	0	0	245	6	214	0	32	13	317	0
TOTAL "OTHER" DEVELOPMENTS	0	0	0	0	0	4	4	0	0	0	0	0
Condominium Development	0	0	0	0	0	0	1	0	0	0	0	0
Police Station Redevelopment	0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development	0	0	0	0	0	4	3	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/O PROJECT	**0**	**0**	**0**	**0**	**245**	**10**	**218**	**0**	**32**	**13**	**317**	**0**
TOTAL "NEW" SITE TRAFFIC	**0**	**0**	**0**	**0**	**0**	**3**	**11**	**0**	**9**	**2**	**0**	**0**
Residential	0	0	0	0	0	3	11	0	9	2	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments	0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT	**0**	**0**	**0**	**0**	**245**	**13**	**229**	**0**	**41**	**15**	**317**	**0**
"New" Site Traffic % of Total *0.0%*	0.0	0.0	0.0	0.0	0.0	23.1	4.8	0.0	22.0	13.3	0.0	0.0

INTERSECTION VOLUME SUMMARY
New Street/Pleasant Grove Rd

Crebilly Farm
I:\eng\816451 - Crebilly Farm\Traffic\Analysis\2017-1-20 TIS PennDOT & Twp\SD **Weekday 4-6 PM**
Design Year 2028 - Alternative A - 319 total units (Access Opposite Bridlewood Blvd)

		EASTBOUND Pleasant Grove Rd			NORTHBOUND New Street			WESTBOUND Pleasant Grove Rd			SOUTHBOUND New Street		
Traffic Component		L	S	R	L	S	R	L	S	R	L	S	R
EXISTING TRAFFIC		0	0	0	0	103	13	231	0	31	9	133	0
Seasonal Adjustment Factor	1.000	0	0	0	0	103	13	231	0	31	9	133	0
Balancing Adjustments		0	0	0	0	148	0	36	0	0	0	144	0
ADJUSTED EXISTING TRAFFIC		**0**	**0**	**0**	**0**	**251**	**13**	**267**	**0**	**31**	**9**	**277**	**0**
Background Growth	22.56 %	0	0	0	0	57	3	60	0	7	2	63	0
EXISTING W/ BACKGROUND		0	0	0	0	308	16	327	0	38	11	340	0
TOTAL "OTHER" DEVELOPMENTS		0	0	0	0	0	3	4	0	0	0	0	0
Condominium Development		0	0	0	0	0	0	0	0	0	0	0	0
Police Station Redevelopment		0	0	0	0	0	0	0	0	0	0	0	0
Arborview Development		0	0	0	0	0	3	4	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/OUT PROJECT		**0**	**0**	**0**	**0**	**308**	**19**	**331**	**0**	**38**	**11**	**340**	**0**
TOTAL "NEW" SITE TRAFFIC		**0**	**0**	**0**	**0**	**0**	**12**	**7**	**0**	**4**	**8**	**0**	**0**
Residential		0	0	0	0	0	12	7	0	4	8	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Traffic		0	0	0	0	0	0	0	0	0	0	0	0
Other Adjustments		0	0	0	0	0	0	0	0	0	0	0	0
FUTURE TRAFFIC W/ PROJECT		**0**	**0**	**0**	**0**	**308**	**31**	**338**	**0**	**42**	**19**	**340**	**0**
"New" Site Traffic % of Total	*0.0%*	0.0	0.0	0.0	0.0	0.0	38.7	2.1	0.0	9.5	42.1	0.0	0.0

ATTACHMENT 4

Comment 6

Table 6. Level of Service Matrices

U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926)

Time Period			Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
Design Year			2016	2023 Design Year			2016	2023 Design Year		
Development Condition			Existing	w/o Dev Base	w/o Dev[1] Optimized	w/ Dev Optimized[1] Alternative A	Existing	w/o Dev Base	w/o Dev[1] Optimized	w/ Dev Optimized[1] Alternative A
Street Road (S.R. 0926)	EB	Left	F 208.0	F 268.1	F 231.8	F 279.0	F 100.0	F 148.0	F 129.7	F 155.2
		Left	F	F	F	F	F	F	F	F
		Thru	209.8	283.4	242.7	300.4	110.9	165.7	144.7	176.2
		Right								
	WB	Left	E 70.2	E 72.9	F 116.6	F 134.0	E 63.9	E 65.0	F 85.3	F 85.3
		Thru	E 66.4	E 66.7	F 91.4	F 107.0	E 79.7	F 86.6	F 162.9	F 187.3
		Right	E 58.8	E 58.4	E 65.3	E 66.5	E 56.8	E 55.7	E 61.9	E 61.9
U.S. Route 202 (Wilmington Pike)	NB	Left	D 37.8	D 38.8	D 41.5	D 42.2	D 41.0	D 42.4	D 42.7	E 57.8
		Thru	F 92.9	F 153.8	F 144.1	F 139.9	F 99.0	F 155.3	F 128.1	F 128.1
		Right	C 23.1	C 24.8	C 25.3	C 25.0	C 26.1	C 28.2	C 26.1	C 26.1
	SB	Left	D 39.6	D 43.4	D 49.0	D 54.7	E 62.5	F 96.2	F 83.0	F 94.2
		Thru	F 73.5 v/c> 1.0	F 124.6	F 116.0	F 124.4	F 227.5	F 278.4	F 244.9	F 269.1
		Thru	F	F	F	F	F	F	F	F
		Right	77.6 v/c > 1.0	137.7	128.5	138.2	221.5	277.5	243.3	268.5
Overall			F 104.1	F 157.1	F 146.0	F 160.9	F 140.1	F 187.0	F 167.8	F 181.8

(1) Future traffic signal timings have been optimized.

Table 6. Level of Service Matrices

U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926)
Intersection Improvement Alternatives

Time Period			Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
Design Year			2023 Design Year		2023 Design Year	
Development Condition			w/ Dev[1]		w/ Dev[1]	
			U.S. Route 202 Southbound Right-Turn Lane	Street Road (S.R. 0926) Improvements	U.S. Route 202 Southbound Right-Turn Lane	Street Road (S.R. 0926) Improvements
			Alternative A	Alternative A	Alternative A	Alternative A
Street Road (S.R. 0926)	EB	Left	F 250.0	F 202.6	F 155.2	F 159.9
		Left Thru	F 268.5		F 176.2	
		Right		F 187.9		F 97.4
	WB	Left	F 118.2	D 54.4	F 85.3	D 43.7
		Thru	F 96.9	F 81.4	F 187.3	F 152.5
		Right	E 65.6	D 47.7	E 61.9	D 44.5
U.S. Route 202 (Wilmington Pike)	NB	Left	D 42.3	C 29.7	E 57.8	C 33.0
		Thru	F 159.0	F 133.7	F 128.1	F 109.1
		Right	C 26.8	B 18.5	C 26.1	B 18.5
	SB	Left	D 54.1	C 30.8	F 94.2	D 40.3
		Thru	F 94.6	F 116.1	F 240.5	F 244.0
		Thru Right	C 26.8	F 130.0	C 27.3	F 243.1
Overall			F 144.5	F 131.9	F 165.3	F 156.8

(1) Future traffic signal timings have been optimized.

Table 6. Level of Service Matrices

Street Road (S.R. 0926) and New Street

Time Period			Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
Design Year			2016	2023 Design Year			2016	2023 Design Year		
Development Condition			Existing	w/o Dev Base	w/o Dev[1] Optimized	w/ Dev Optimized[1] Alternative A	Existing	w/o Dev Base	w/o Dev[1] Optimized	w/ Dev Optimized[1] Alternative A
Street Road (S.R. 0926)	EB	Left	A	B	C	C	B	B	B	B
		Thru	9.8	12.7	21.7	22.0	12.4	14.4	18.9	19.9
		Right								
	WB	Left	A	A	A	B	A	B	B	B
		Thru	5.8	6.2	9.8	10.0	9.8	10.7	13.8	14.0
		Right								
New Street	NB	Left	C	C	C	C	C	D	C	C
		Thru	33.3	33.7	27.4	27.4	34.9	36.2	31.1	31.4
		Right								
	SB	Left	F	F	F	F	F	F	F	F
		Thru	243.7	324.0	129.9	140.5	207.1	294.3	182.0	189.4
		Right								
Overall			E	F	D	D	E	F	E	E
			70.5	92.4	47.1	50.2	70.1	95.6	65.4	67.6

(1) Future traffic signal timings have been optimized

Table 6. Level of Service Matrices

Street Road (S.R. 0926) and Bridlewood Boulevard

Time Period			Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Design Year			2016	2023 Design Year		2016	2023 Design Year	
Development Condition			Existing	w/o Dev	w/ Dev Alternative A	Existing	w/o Dev	w/ Dev Alternative A
Street Road (S.R. 0926)	EB	Thru	(1)	(1)	(1)	(1)	(1)	(1)
		Right	(1)	(1)	(1)	(1)	(1)	(1)
	WB	Left	B 11.6	B 12.3	B 12.3	B 10.5	B 11.0	B 11.1
		Thru	(1)	(1)	(1)	(1)	(1)	(1)
		Right						
Bridlewood Boulevard	NB	Left	C 23.5	D 31.0	D 31.7	D 25.5	D 34.1	E 35.3
		Right	B 14.6	C 16.3	C 16.4	B 13.4	B 14.8	B 14.9
Overall			A 1.3	A 1.6	A 1.6	A 1.4	A 1.7	A 1.7

(1) Movement operates at free-flow conditions.

Table 6. Level of Service Matrices

U.S. Route 202 (Wilmington Pike) and West Pleasant Grove Road

Time Period			Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Design Year			2016	2023 Design Year		2016	2023 Design Year	
Development Condition			Existing	w/o Dev	w/ Dev Alternative A	Existing	w/o Dev	w/ Dev Alternative A
West Pleasant Grove Road	EB	Right	C 24.3	D 32.1	D 34.9	C 22.1	D 27.0	D 28.4
	WB	Right	C 23.4	D 30.1	D 31.7	C 20.4	D 26.8	D 27.8
U.S. Route 202 (Wilmington Pike)	NB	Left	C 19.2	C 23.4	C 23.8	C 20.8	D 26.8	D 28.6
		Thru	(1)	(1)	(1)	(1)	(1)	(1)
		Thru/ Right	(1)	(1)	(1)	(1)	(1)	(1)
	SB	Left	C 21.5	D 32.9	E 35.9	C 23.0	D 34.7	E 36.7
		Thru	(1)	(1)	(1)	(1)	(1)	(1)
		Thru/ Right	(1)	(1)	(1)	(1)	(1)	(1)
Overall			A 0.7	A 1.1	A 1.2	A 0.9	A 1.4	A 1.5

(1) Movement operates at free-flow conditions.

Table 6. Level of Service Matrices

New Street and West Pleasant Grove Road

Time Period		Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Design Year		2016	2023 Design Year		2016	2023 Design Year	
Development Condition		Existing	w/o Dev	w/ Dev Alternative A	Existing	w/o Dev	w/ Dev Alternative A
West Pleasant Grove Road	WB Left	C	C	C	C	E	E
	WB Right	15.0	18.1	19.3	22.6	36.3	44.7
New Street	NB Thru	(1)	(1)	(1)	(1)	(1)	(1)
	NB Right						
	SB Left	A	A	A	A	A	A
	SB Thru	8.8	8.9	8.9	8.8	9.0	9.0
Overall		A	A	A	A	B	C
		4.6	5.6	6.2	8.0	12.9	16.0

(1) Movement operates at free-flow conditions.

Table 6. Level of Service Matrices

U.S. Route 202 (Wilmington Pike) and Site Access

Time Period		Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year		2023 Design Year	2023 Design Year
Development Condition		w/ Dev	w/ Dev
		Alternative A	Alternative A
Site Access	EB Right	C 21.7	C 22.0
U.S. Route 202 (Wilmington Pike)	SB Thru (2)	(1)	(1)
	SB Right	(1)	(1)
Overall		A 0.2	A 0.1

(1) Movement operates at free-flow conditions.

Table 6. Level of Service Matrices

Street Road (S.R. 0926) and Site Access

Time Period			Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year			2023 Design Year	2023 Design Year
Development Condition			w/ Dev	w/ Dev
			Alternative A	Alternative A
Street Road (S.R. 0926)	EB	Left	A 4.7	A 6.3
		Thru	A 7.7	A 6.5
	WB	Thru	A 3.7	A 4.5
		Right	A 2.6	A 2.9
Site Access*	SB	Left	B 19.2	B 15.9
		Right	B 16.3	B 14.8
Overall			A 7.3	A 6.0

Table 6. Level of Service Matrices

Alternate Street Road (S.R. 0926) Site Access Opposite Bridlewood Boulevard

			Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Time Period			2023 Design Year	2023 Design Year
Design Year			w/ Dev	w/ Dev
Development Condition			Alternative A	Alternative A
Street Road (S.R. 0926)	EB	Left	A 5.9	A 7.3
		Thru	B 10.7	A 7.5
		Right	A 3.4	A 3.5
	WB	Left	B 15.3	B 12.5
		Thru	A 4.6	A 5.3
		Right	A 3.3	A 3.6
Bridlewood Boulevard	NB	Left	B 17.5	B 15.5
		Thru	B 17.4	B 16.3
		Right		
Site Access	SB	Left	B 18.3	B 16.6
		Thru	B 17.1	B 15.4
		Right		
Overall			A 9.8	A 7.6

(1) Movement operates at free-flow conditions.

Table 6. Level of Service Matrices

West Pleasant Grove Road and West Site Access

Time Period			Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year			2023 Design Year	2023 Design Year
Development Condition			w/ Dev	w/ Dev
			Alternative A	Alternative A
West Pleasant Grove Road	EB	Thru/ Right	(1)	(1)
	WB	Left/ Thru	A 8.2	A 8.2
West Site Access	NB	Left	A	B
		Right	9.3	10.6
Overall			A 0.9	A 0.7

(1) Movement operates at free-flow conditions.

Table 6. Level of Service Matrices

West Pleasant Grove Road and East Site Access

Time Period			Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year			2023 Design Year	2023 Design Year
Development Condition			w/ Dev	w/ Dev
			Alternative A	Alternative A
West Pleasant Grove Road	EB	Thru/ Right	(1)	(1)
	WB	Left/ Thru	A 8.2	A 8.1
East Site Access	NB	Left	A	A
		Right	9.0	9.9
Overall			A 0.4	A 0.3

(1) Movement operates at free-flow conditions.

Table 7. 95th Percentile Queue Matrices

U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926)

Time Period			Current Storage [1]	Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
Design Year				2016	2023 Design Year			2016	2023 Design Year		
Development Condition				Existing	w/o Dev Base	w/o Dev[2] Optimized	w/ Dev Optimized[2] Alternative A	Existing	w/o Dev Base	w/o Dev[2] Optimized	w/ Dev Optimized[2] Alternative A
Street Road (S.R. 0926)	EB	Left	450'	1230	1518	1488	1733	625	1035	1013	1125
		Left Thru Right	*4,700*	1363	1715	1675	1978	958	1193	1163	1308
	WB	Left	200'	285	325	410	435	285	335	378	378
		Thru	*680'*	258	290	343	378	450	540	855	938
		Right	215'	45	55	60	60	48	60	65	65
US Route 202 (Wilmington Pike)	NB	Left	305'	25	25	25	35	45	53	53	218
		Thru	*2,800'*	1328	2340	2388	2370	1348	2363	2263	2263
		Right	170'	130	158	165	163	103	128	123	123
	SB	Left	375'	63	80	85	103	148	283	270	293
		Thru	*4,400'*	1788	2268	2325	2403	2800	3388	3260	3395
		Thru Right	*4,400'*	1850	2423	2478	2570	2863	3525	3388	3538

(1) Distance to adjacent signalized intersections shown in italics.

(2) Future traffic signal timings have been optimized

Table 7. 95th Percentile Queue Matrices

U.S. Route 202 (Wilmington Pike) and Street Road (S.R. 0926) Intersection Improvement Alternatives

Time Period			Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
Design Year			2023 Design Year		2023 Design Year	
Development Condition			w/ Dev[2]		w/ Dev[2]	
			U.S. Route 202 Southbound Right-Turn Lane	Street Road (S.R. 0926) Improvements	U.S. Route 202 Southbound Right-Turn Lane	Street Road (S.R. 0926) Improvements
			Alternative A	Alternative A	Alternative A	Alternative A
Street Road (S.R. 0926)	EB	Left	1675	893	1125	630
		Left	1910		1308	
		Thru		878		460
		Right				
	WB	Left	415	258	378	245
		Thru	363	298	938	758
		Right	60	43	65	48
U.S. Route 202 (Wilmington Pike)	NB	Left	38	25	218	83
		Thru	2453	1953	2263	1785
		Right	170	120	123	88
	SB	Left	105	65	293	118
		Thru	2015	1970	3045	2888
		Thru		2135		3008
		Right	243		198	

(1) Distance to adjacent signalized intersections shown in *Italics*.

(2) Future traffic signal timings have been optimized

Table 7. 95th Percentile Queue Matrices

Street Road (S.R. 0926) and New Street

Time Period			Current Storage [1]	Future Storage [1]	Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
Design Year					2016	2023 Design Year			2016	2023 Design Year		
Development Condition					Existing	w/o Dev Base	w/o Dev[2] Optimized	w/ Dev Optimized[2] Alternative A	Existing	w/o Dev Base	w/o Dev[2] Optimized	w/ Dev Optimized[2] Alternative A
Street Road (S.R. 0926)	EB	Left / Thru / Right	*2,200'*	*2,200'*	440	575	725	738	440	538	610	640
	WB	Left / Thru / Right	*4,700'*	*3,300'*	188	218	258	268	288	345	380	388
New Street	NB	Left / Thru / Right	-	-	113	128	115	118	240	273	255	263
	SB	Left / Thru / Right	-	-	1178	1503	1023	1083	1410	1833	1520	1560

(1) Distance to adjacent signalized intersections shown in italics

(2) Future traffic signal timings have been optimized

Table 7. 95th Percentile Queue Matrices

Street Road (S.R. 0926) and Bridlewood Boulevard

Time Period			Current Storage[1]	Future Storage[1]	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Design Year					2016	2023 Design Year		2016	2023 Design Year	
Development Condition					Existing	w/o Dev	w/ Dev Alternative A	Existing	w/o Dev	w/ Dev Alternative A
Street Road (S.R. 0926)	EB	Thru	*2,400'*	*2,400'*	-	-	-	-	-	-
		Right	350'	350'	-	-	-	-	-	-
	WB	Left	120'	120'	0	25	25	25	25	25
		Thru	*2,300'*	*1500'*	-	-	-	-	-	-
Bridlewood Boulevard	NB	Left	125'	125'	25	28	28	25	25	25
		Right			25	25	25	25	25	25

(1) Distance to adjacent signalized intersections shown in italics.

Table 7. 95th Percentile Queue Matrices

U.S. Route 202 (Wilmington Pike) and West Pleasant Grove Road

Time Period			Current Storage [1]	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Design Year				2016	2023 Design Year		2016	2023 Design Year	
Development Condition				Existing	w/o Dev	w/ Dev Alternative A	Existing	w/o Dev	w/ Dev Alternative A
West Pleasant Grove Road	EB	Right	-	25	33	40	25	25	25
	WB	Right	-	25	25	25	25	25	25
U.S. Route 202 (Wilmington Pike)	NB	Left	350'	25	25	25	25	25	25
		Thru	*3,100'*	-	-	-	-	-	-
		Thru/ Right	*3,100'*	-	-	-	-	-	-
	SB	Left	380'	25	43	48	40	70	75
		Thru	*1,200'*	-	-	-	-	-	-
		Thru/ Right	*1,200'*	-	-	-	-	-	-

(1) Distance to adjacent signalized intersections shown in italics.

Table 7. 95th Percentile Queue Matrices
New Street and West Pleasant Grove Road

Time Period			Current Storage [1]	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Design Year				2016	2023 Design Year		2016	2023 Design Year	
Development Condition				Existing	w/o Dev	w/ Dev Alternative A	Existing	w/o Dev	w/ Dev Alternative A
West Pleasant Grove Road	WB	Left	-	45	65	78	108	183	218
		Right							
New Street	NB	Thru	*3,350'*	-	-	-	-	-	-
		Right							
	SB	Left	-	0	0	25	0	0	25
		Thru							

(1) Distance to adjacent signalized intersections shown in italics.

Table 7. 95th Percentile Queue Matrices

U.S. Route 202 (Wilmington Pike) and Site Access

Time Period			Future Storage	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year				2023 Design Year	2023 Design Year
Development Condition				w/ Dev	w/ Dev
				Alternative A	Alternative A
Site Access	EB	Right	-	25	25
U.S. Route 202 (Wilmington Pike)	SB	Thru (2)	-	-	-
		Right	225'	-	-

Table 7. 95th Percentile Queue Matrices

Street Road (S.R. 0926) and Site Access

Time Period			Future Storage [1]	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year				2023 Design Year	2023 Design Year
Development Condition				w/ Dev	w/ Dev
				Alternative A	Alternative A
Street Road (S.R. 0926)	EB	Left	150'	0	25
		Thru	*1,350'*	325	268
	WB	Thru	*1,050'*	105	163
		Right	150'	25	25
Site Access	SB	Left	100'	50	25
		Right	-	25	25

(1) Distance to adjacent signalized intersections shown in italics.

Table 7. 95th Percentile Queue Matrices

Alternate Street Road (S.R. 0926) Site Access Opposite Bridlewood Boulevard

Time Period			Future Storage [1]	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year				2028 Design Year	2028 Design Year
Development Condition				w/ Dev	w/ Dev
				Alternative A	Alternative A
Street Road (S.R. 0926)	EB	Left	150'	0	25
		Thru	*2,400'*	388	290
		Right	350'	25	25
	WB	Left	120'	25	25
		Thru	*2,300'*	125	173
		Right	175'	25	25
Bridlewood Boulevard	NB	Left	125'	28	25
		Thru	125'	25	33
		Right			
Site Access	SB	Left	100'	48	25
		Thru	-	25	25
		Right			

(1) Distance to adjacent signalized intersections shown in italics.

Table 7. 95th Percentile Queue Matrices

West Pleasant Grove Road and West Site Access

Time Period			Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year			2023 Design Year	2023 Design Year
Development Condition			w/ Dev	w/ Dev
			Alternative A	Alternative A
West Pleasant Grove Road	EB	Thru	-	-
		Right		
	WB	Left	0	25
		Thru		
West Site Access	NB	Left	25	25
		Right		

Table 7. 95th Percentile Queue Matrices

West Pleasant Grove Road and Eastern Site Access

Time Period			Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Design Year			2023 Design Year	2023 Design Year
Development Condition			w/ Dev	w/ Dev
			Alternative A	Alternative A
West Pleasant Grove Road	EB	Thru	-	-
		Right		
	WB	Left	0	0
		Thru		
East Site Access	NB	Left	0	0
		Right		

ATTACHMENT 5

Comment 7

Street Road (S.R. 0926) and New Street

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Eastbound Street Road (S.R. 0926) Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	98	3.0%	103
	Through	-	853	3.0%	892
	Right	Yes	5	0.0%	5
Opposing	Left	Yes	18	27.0%	26
	Through	-	409	8.0%	459
	Right	Yes	61	6.0%	67

Advancing Volume:	1000
Opposing Volume:	552
Left Turn Volume:	103
% Left Turns in Advancing Volume:	10.30%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 3**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	103
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: 3.0

PennDOT Publication 46, Exhibit 11-6

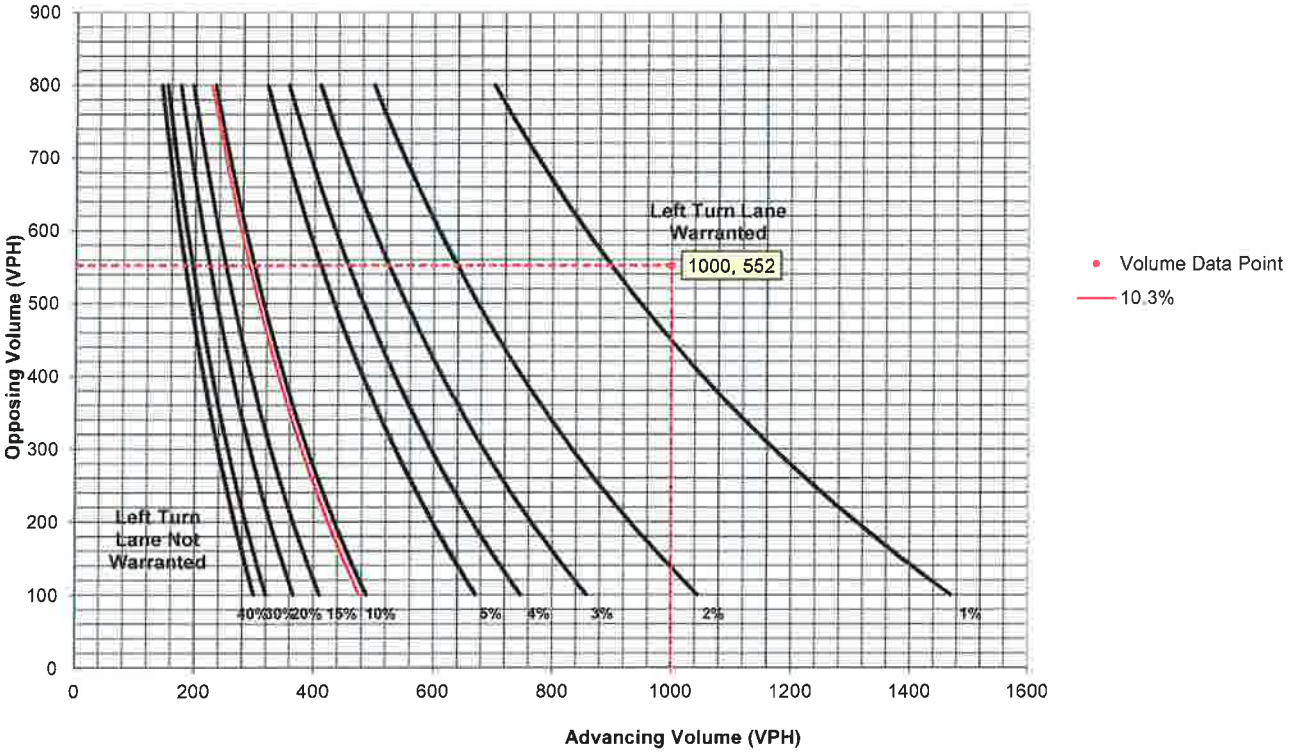
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	225	Feet
Required Left Turn Lane Storage Length:	225	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 3. Warrant for left turn lanes on two-lane highways (45 mph speed, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Eastbound Street Road (S.R. 0926) Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	51	3.0%	54
	Through	-	775	3.0%	810
	Right	Yes	17	0.0%	17
Opposing	Left	Yes	32	0.0%	32
	Through	-	499	1.0%	507
	Right	Yes	76	0.0%	76

Advancing Volume:	881
Opposing Volume:	615
Left Turn Volume:	54
% Left Turns in Advancing Volume:	6.13%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 3**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	54
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

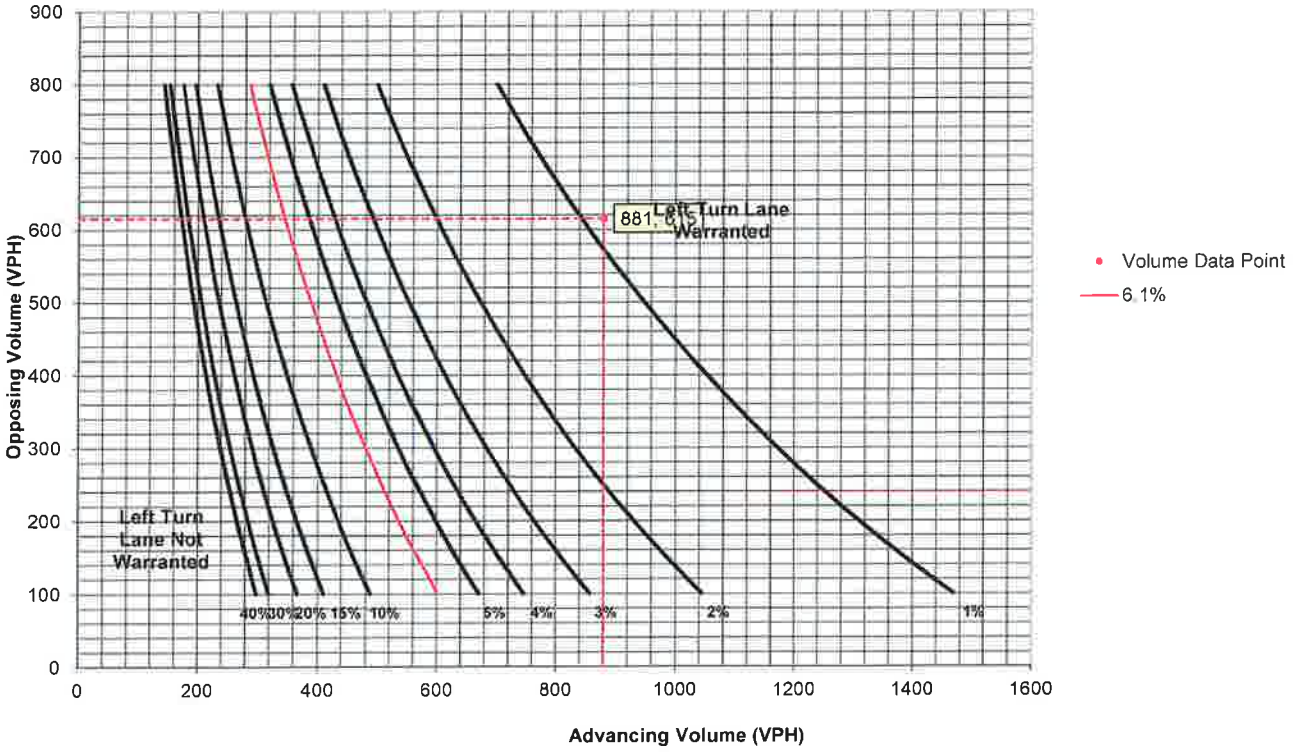
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	175	Feet
Required Left Turn Lane Storage Length:	175	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 3. Warrant for left turn lanes on two-lane highways (45 mph speed, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Eastbound Street Road (S.R. 0926) Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	98	3.0%	103
	Through	-	853	3.0%	892
	Right	-	5	0.0%	5

Advancing Volume:	1000
Right Turn Volume:	5

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 10**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	5
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

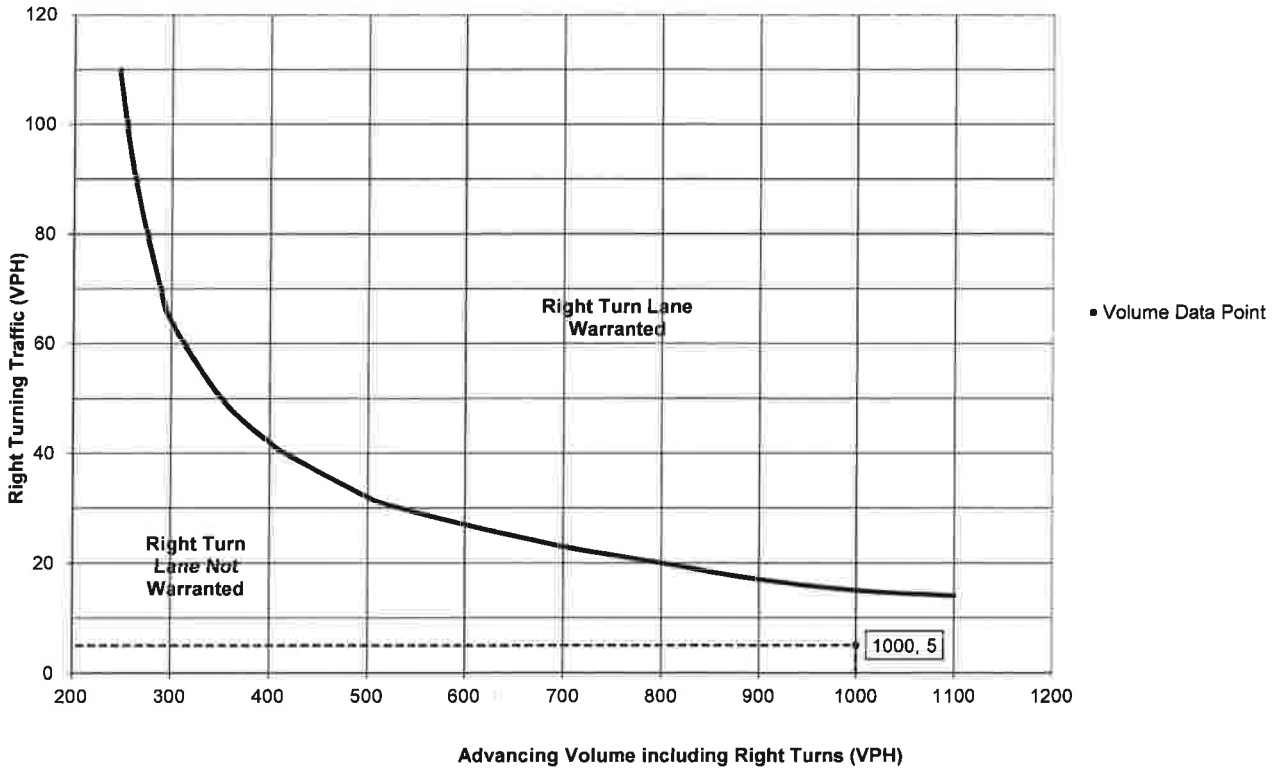
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

Figure 10. Warrant for right turn lanes on two-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Eastbound Street Road (S.R. 0926) Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	51	3.0%	54
	Through	-	775	3.0%	810
	Right	-	17	0.0%	17

Advancing Volume:	881
Right Turn Volume:	17

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 10**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	17
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

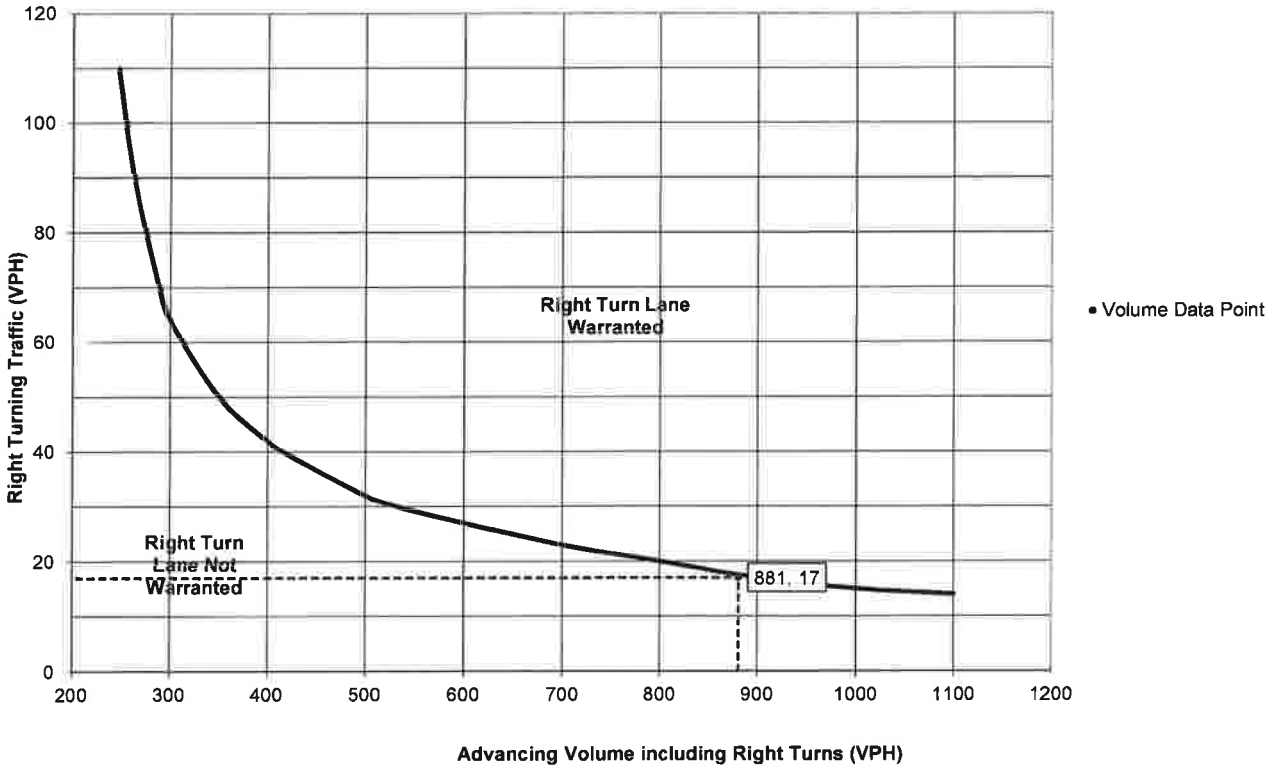
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

Figure 10. Warrant for right turn lanes on two-lane roadways
(45 mph or greater speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Northbound New Street Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	25	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	4	33.0%	6
	Through	-	99	3.0%	104
	Right	Yes	29	9.0%	33
Opposing	Left	Yes	65	4.0%	69
	Through	-	301	0.0%	301
	Right	Yes	181	2.0%	187

Advancing Volume:	143
Opposing Volume:	557
Left Turn Volume:	6
% Left Turns in Advancing Volume:	4.20%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **No**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	6
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

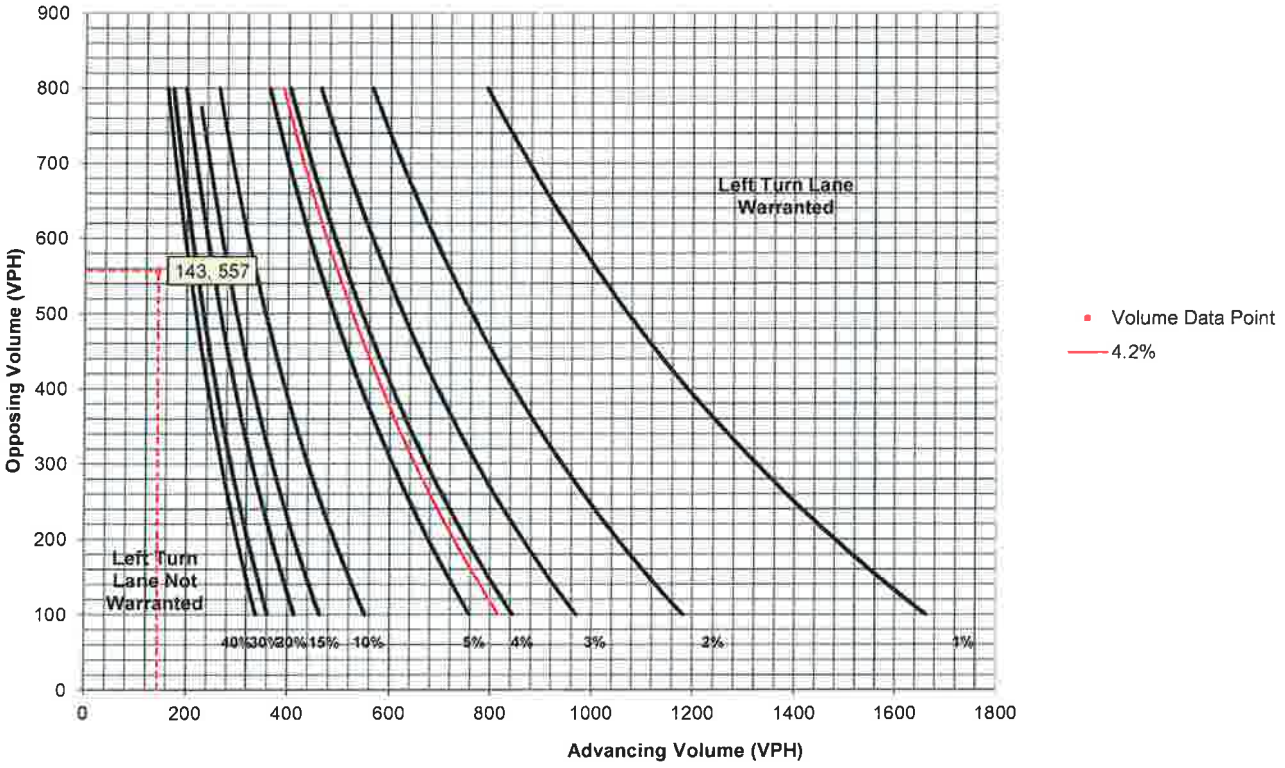
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Northbound New Street Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	25		
Type of Terrain:	Rolling	Type of Analysis	
		Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	12	0.0%	12
	Through	-	211	0.0%	211
	Right	Yes	50	3.0%	53
Opposing	Left	Yes	75	0.0%	75
	Through	-	240	1.0%	244
	Right	Yes	363	1.0%	369

Advancing Volume:	276
Opposing Volume:	688
Left Turn Volume:	12
% Left Turns in Advancing Volume:	4.35%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **No**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	12
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

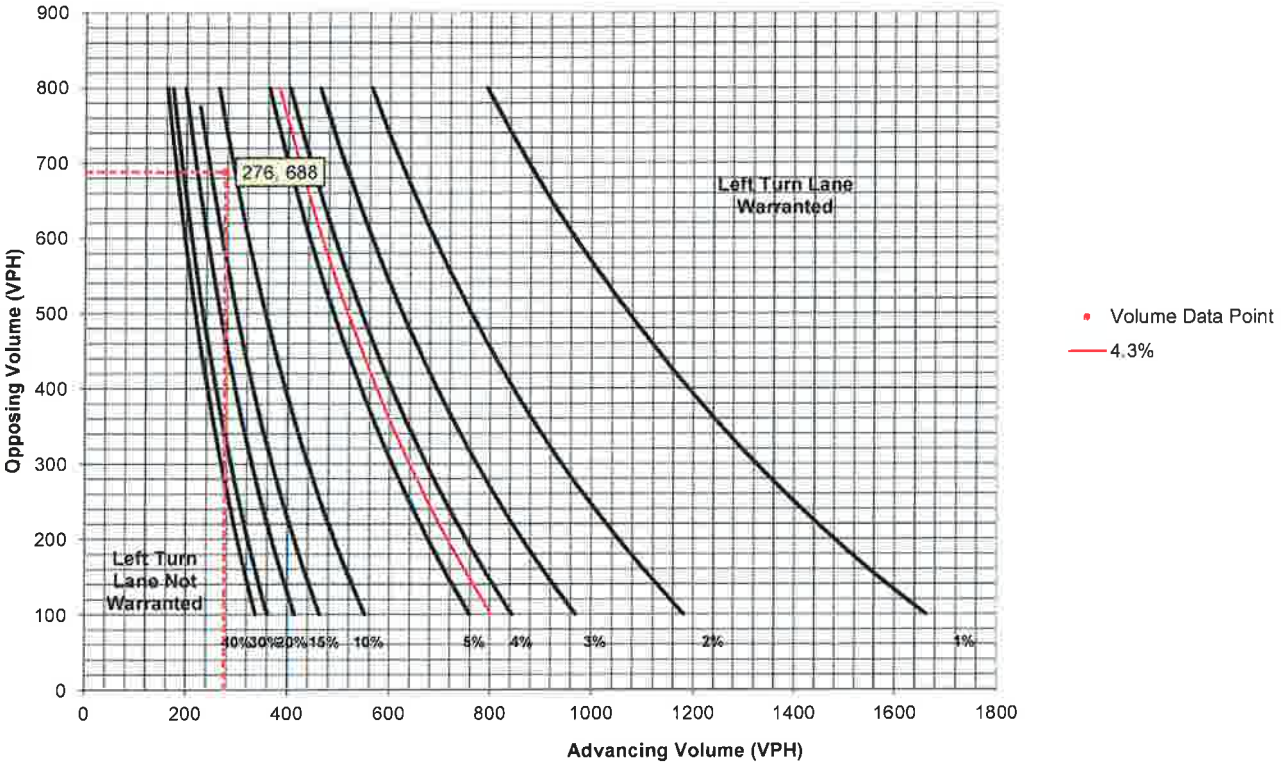
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Northbound New Street Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	25		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	4	33.0%	6
	Through	-	99	3.0%	104
	Right	-	29	9.0%	33

Advancing Volume:	143
Right Turn Volume:	33

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	33
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

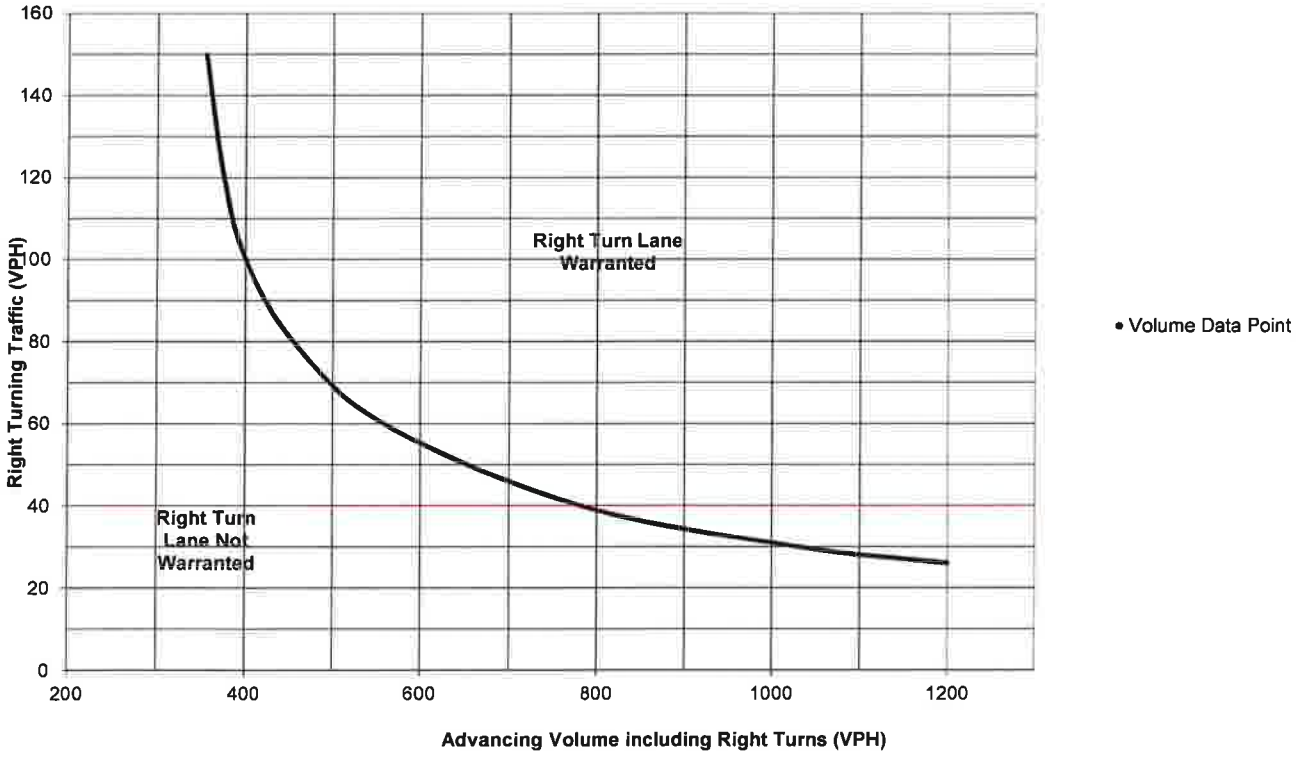
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Northbound New Street Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	25		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	12	0.0%	12
	Through	-	211	0.0%	211
	Right	-	50	3.0%	53

Advancing Volume:	276
Right Turn Volume:	53

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	53
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

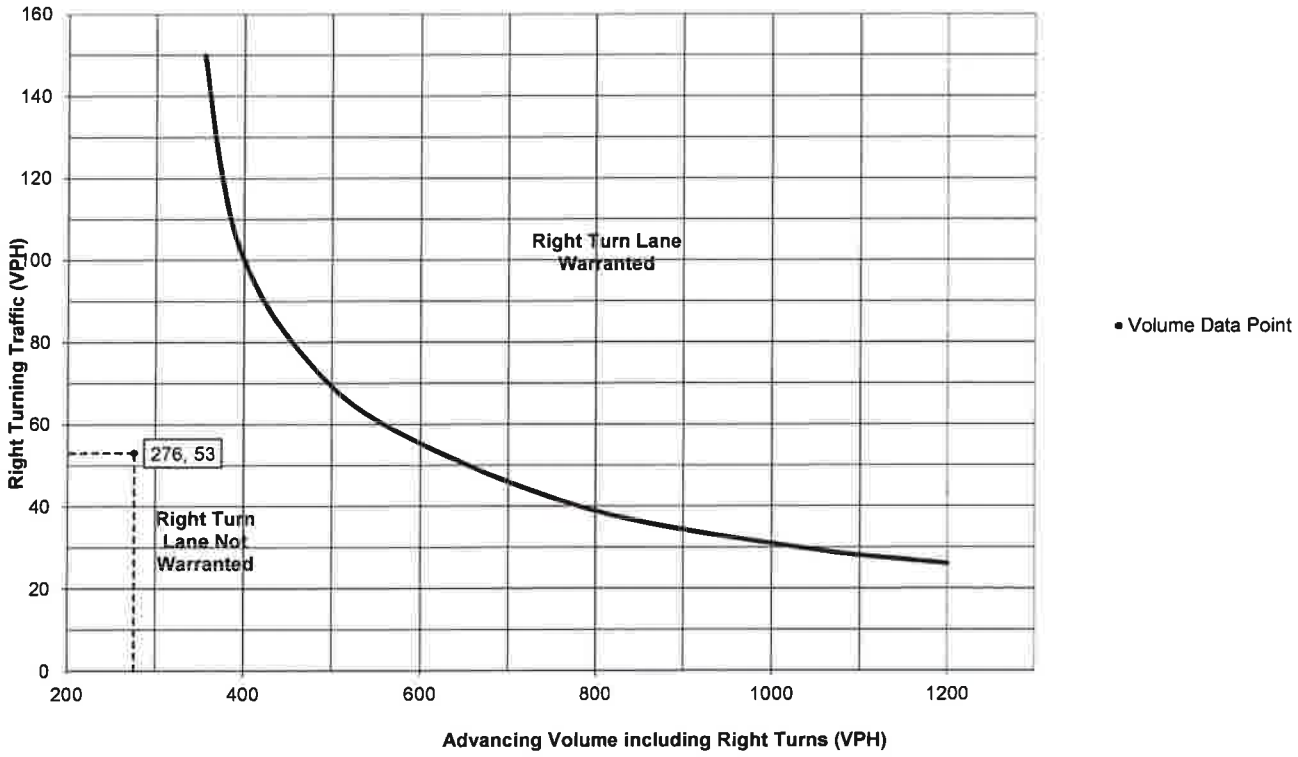
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Southbound New Street Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	35	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	65	4.0%	69
	Through	-	301	0.0%	301
	Right	Yes	181	2.0%	187
Opposing	Left	Yes	4	33.0%	6
	Through	-	99	3.0%	104
	Right	Yes	29	9.0%	33

Advancing Volume:	557
Opposing Volume:	143
Left Turn Volume:	69
% Left Turns in Advancing Volume:	12.39%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	69
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

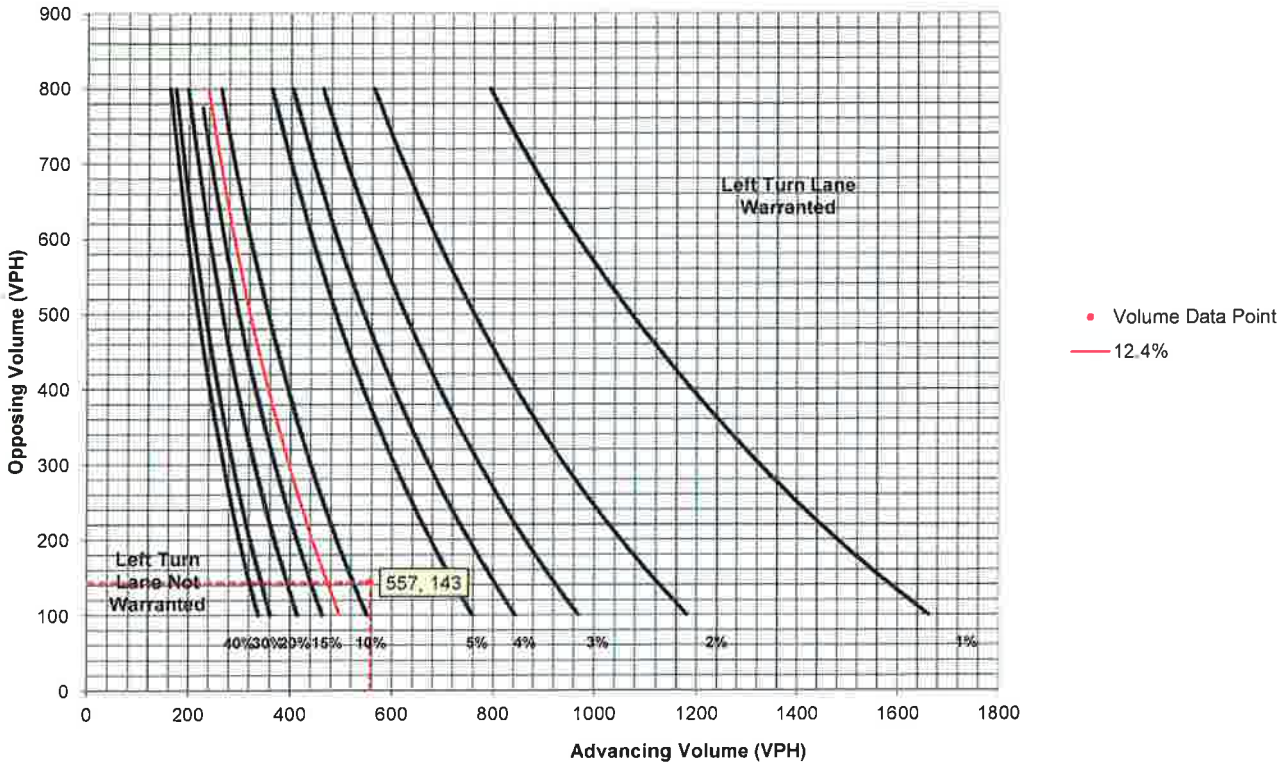
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Southbound New Street Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	35	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	75	0.0%	75
	Through	-	240	1.0%	244
	Right	Yes	363	1.0%	369
Opposing	Left	Yes	12	0.0%	12
	Through	-	211	0.0%	211
	Right	Yes	50	3.0%	53

Advancing Volume:	688
Opposing Volume:	276
Left Turn Volume:	75
% Left Turns in Advancing Volume:	10.90%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	75
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

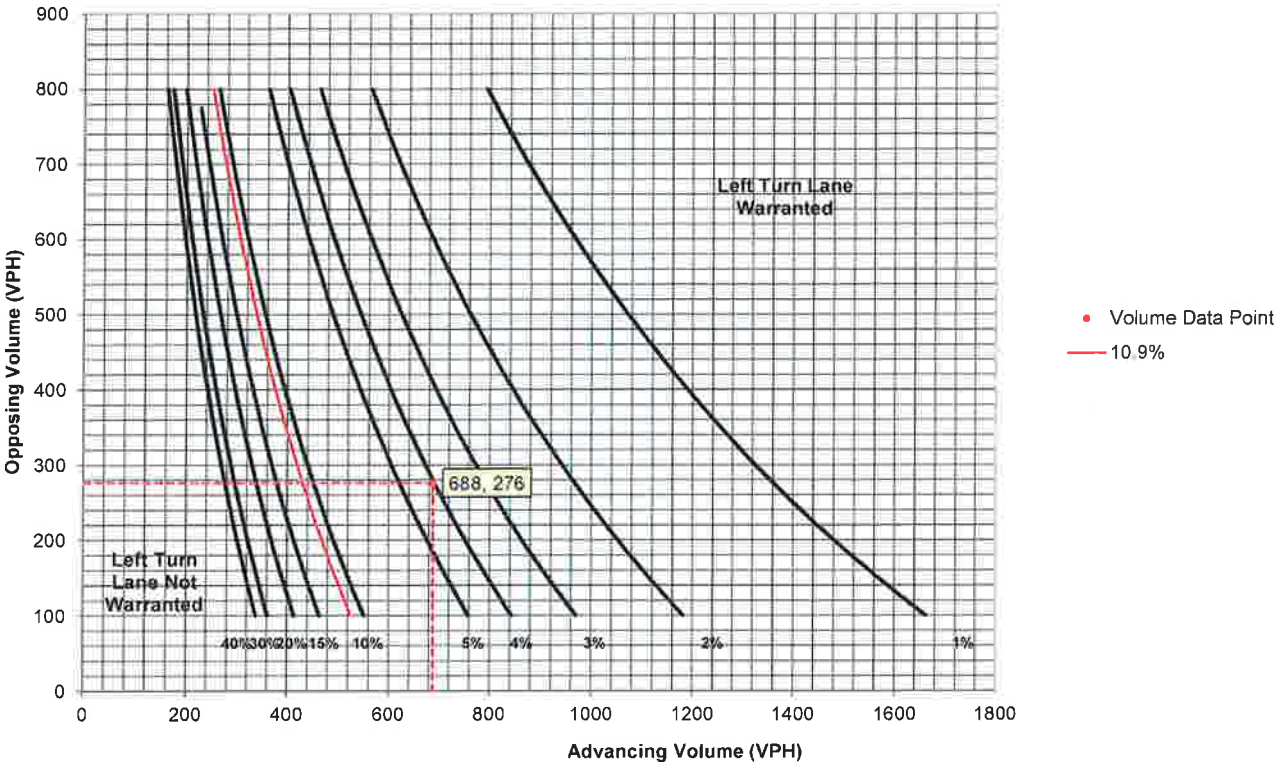
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Southbound New Street Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	35	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	65	4.0%	69
	Through	-	301	0.0%	301
	Right	-	181	2.0%	187

Advancing Volume:	557
Right Turn Volume:	187

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	187
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: 5.0

PennDOT Publication 46, Exhibit 11-6

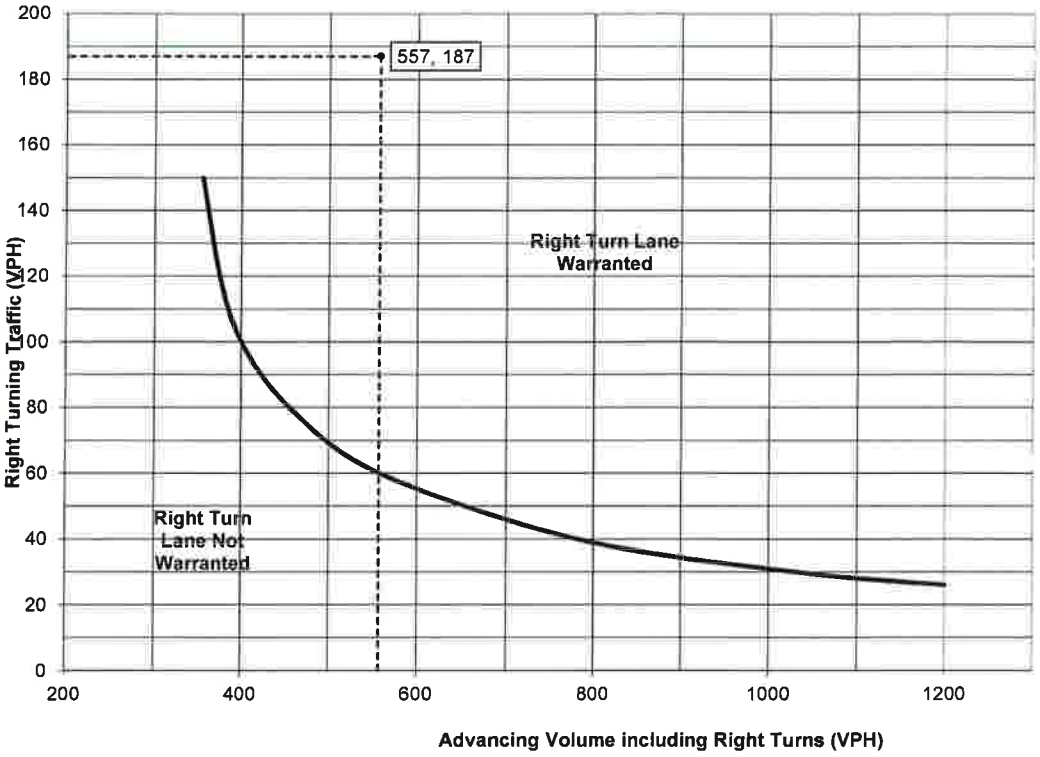
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	200	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	200	Feet

Additional Findings: N/A

Additional Comments / Justifications:

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



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Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Southbound New Street Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	35	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	75	0.0%	75
	Through	-	240	1.0%	244
	Right	-	363	1.0%	369

Advancing Volume:	688
Right Turn Volume:	369

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	369
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: 11.0

PennDOT Publication 46, Exhibit 11-6

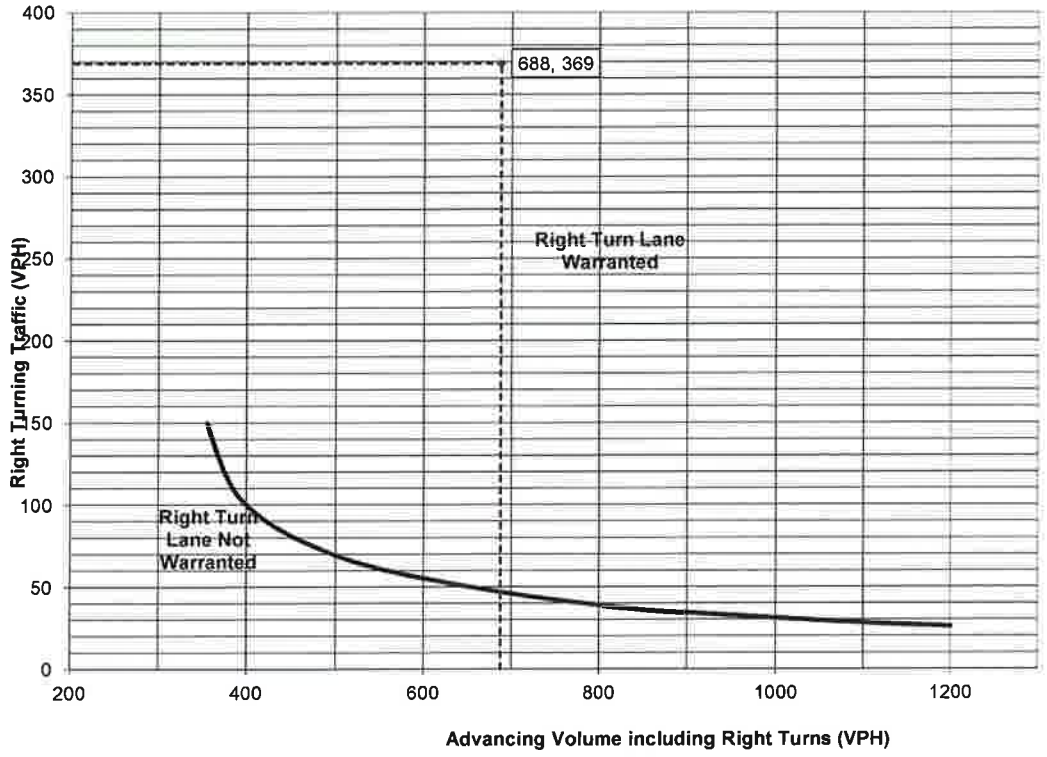
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	400	Feet
Condition B:	N/A	Feet
Condition C:	N/A	Feet
Required Right Turn Lane Storage Length:	400	Feet

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Westbound Street Road (S.R. 0926) Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	18	27.0%	26
	Through	-	409	8.0%	459
	Right	Yes	61	6.0%	67
Opposing	Left	Yes	98	3.0%	103
	Through	-	853	3.0%	892
	Right	Yes	5	0.0%	5

Advancing Volume:	552
Opposing Volume:	1000
Left Turn Volume:	26
% Left Turns in Advancing Volume:	4.71%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 3**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	26
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: 1.0

PennDOT Publication 46, Exhibit 11-6

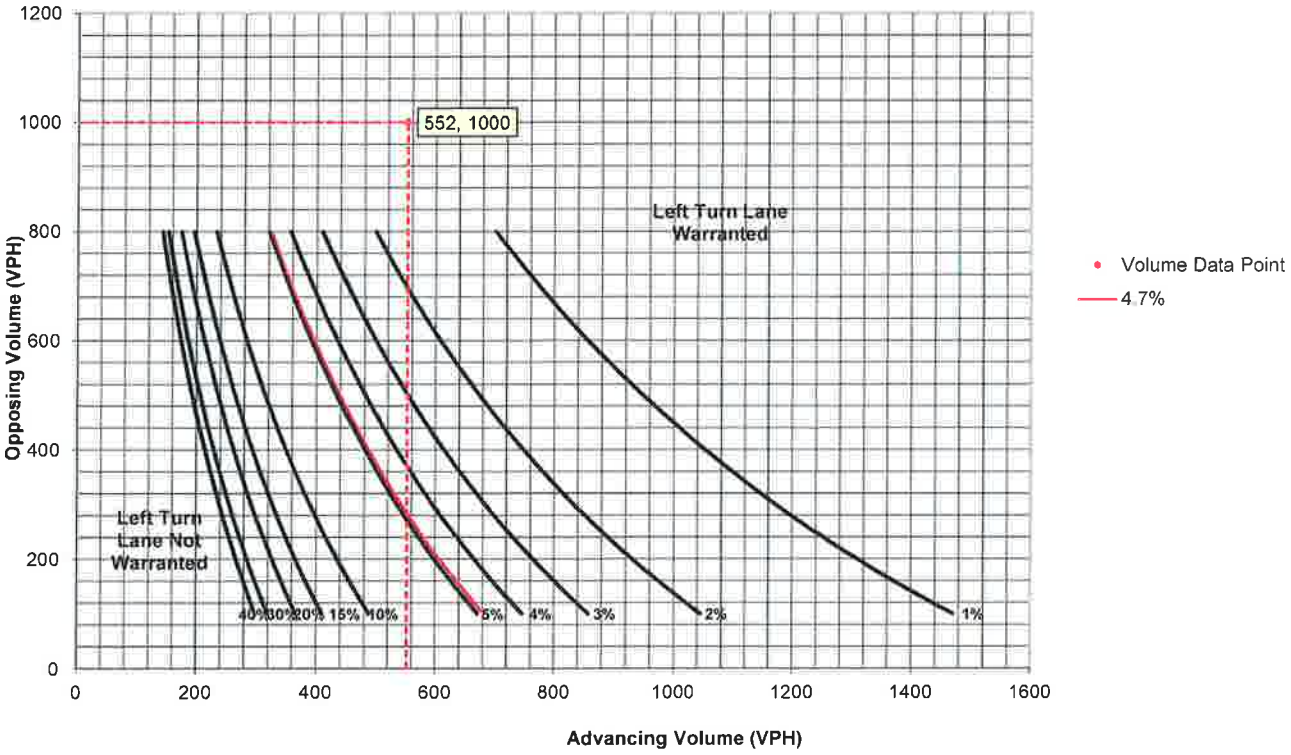
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	150	Feet
Required Left Turn Lane Storage Length:	150	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 3. Warrant for left turn lanes on two-lane highways (45 mph speed, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Westbound Street Road (S.R. 0926) Left-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	32	0.0%	32
	Through	-	499	1.0%	507
	Right	Yes	76	0.0%	76
Opposing	Left	Yes	51	3.0%	54
	Through	-	775	3.0%	810
	Right	Yes	17	0.0%	17

Advancing Volume:	615
Opposing Volume:	881
Left Turn Volume:	32
% Left Turns in Advancing Volume:	5.20%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 3**

Warrant Met?: **Yes**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	32
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: 1.0

PennDOT Publication 46, Exhibit 11-6

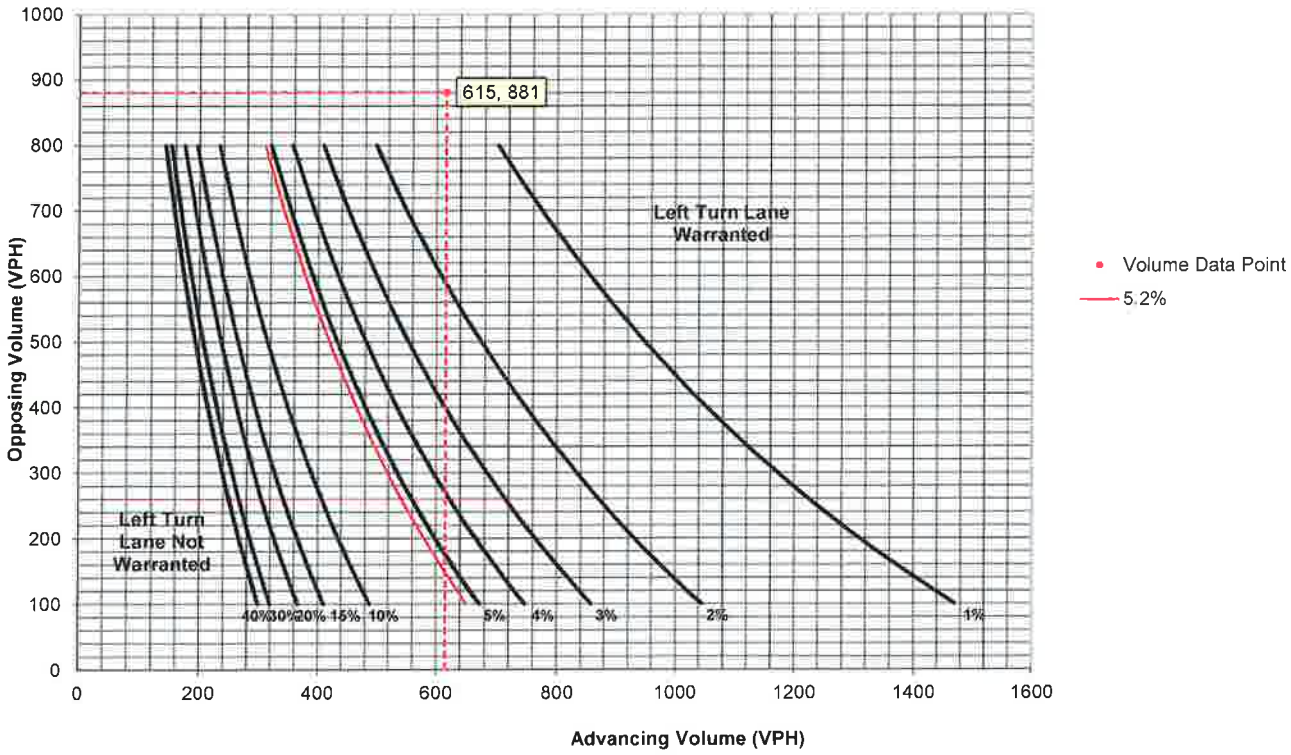
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Left Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	150	Feet
Required Left Turn Lane Storage Length:	150	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 3. Warrant for left turn lanes on two-lane highways (45 mph speed, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Westbound Street Road (S.R. 0926) Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	18	27.0%	26
	Through	-	409	8.0%	459
	Right	-	61	6.0%	67

Advancing Volume:	552
Right Turn Volume:	67

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 10**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	67
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	40

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

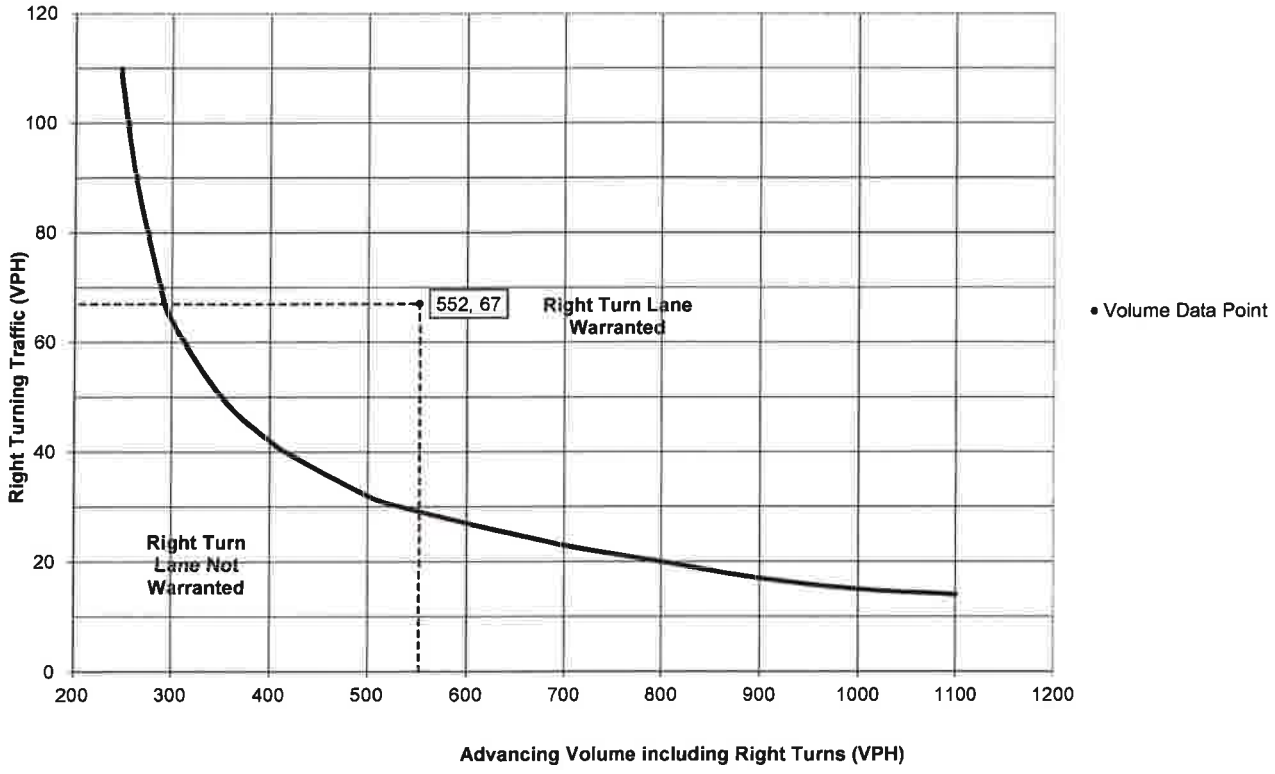
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	175	Feet
Required Right Turn Lane Storage Length:	175	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 10. Warrant for right turn lanes on two-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: Street Road (S.R. 0926) and New Street - Alternative A
Westbound Street Road (S.R. 0926) Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	45	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	32	0.0%	32
	Through	-	499	1.0%	507
	Right	-	76	0.0%	76

Advancing Volume:	615
Right Turn Volume:	76

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 10**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	76
Cycles Per Hour (Assumed):	Known
Cycles Per Hour (If Known):	34

Average # of Vehicles/Cycle: 2.0

PennDOT Publication 46, Exhibit 11-6

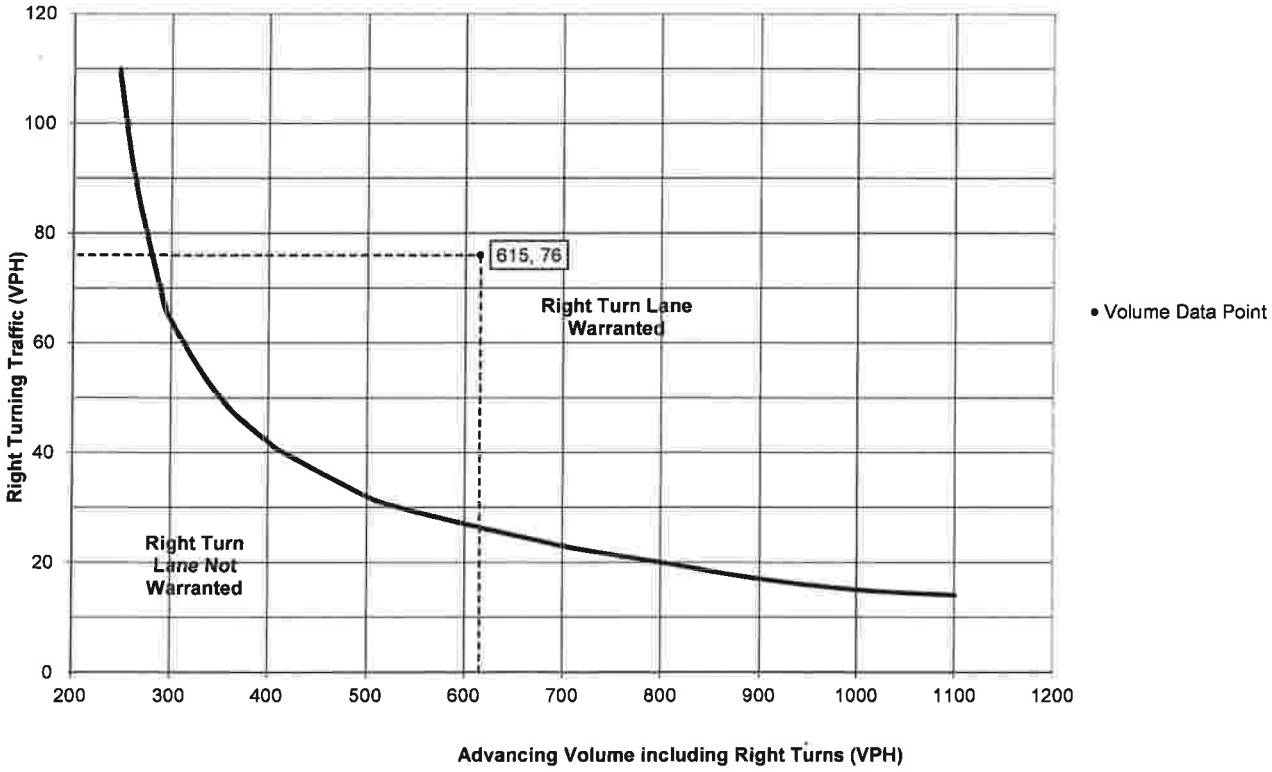
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	125	Feet
Condition C:	175	Feet
Required Right Turn Lane Storage Length:	175	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 10. Warrant for right turn lanes on two-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



New Street and West Pleasant Grove Road

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: New Street and West Pleasant Grove Road - Alternative A
Northbound New Street Right-Turn Lane

Analysis Period:	2028 Design Year	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	245	3.0%	257
	Right	-	13	0.0%	13

Advancing Volume:	270
Right Turn Volume:	13

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	13
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

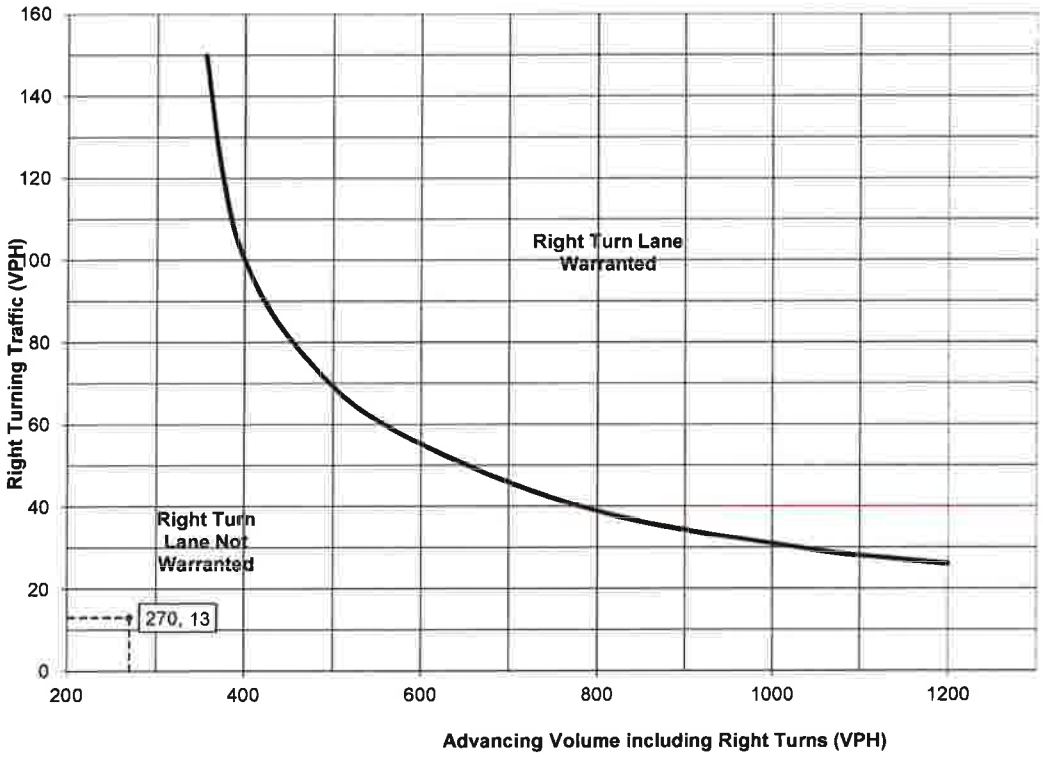
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: New Street and West Pleasant Grove Road - Alternative A
Northbound New Street Right-Turn Lane

Analysis Period:	2028 Design Year	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Signalized		
Posted Speed Limit (MPH):	35	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	0	0.0%	0
	Through	-	308	0.0%	308
	Right	-	31	0.0%	31

Advancing Volume:	339
Right Turn Volume:	31

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Signalized
Design Hour Volume of Turning Lane:	31
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

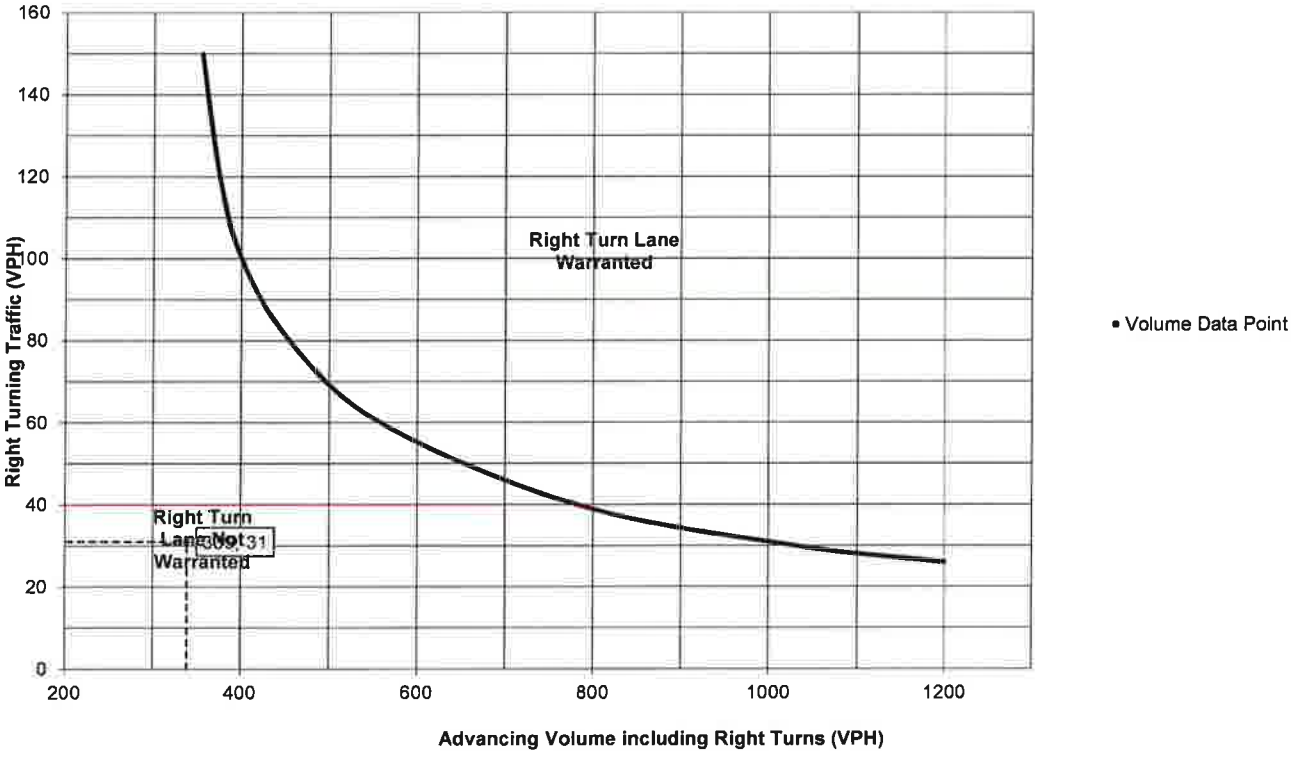
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: New Street and West Pleasant Grove Road - Alternative A
Southbound New Street Left-Turn Lane

Analysis Period:	2028 Design Year	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35	Type of Analysis	
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	15	9.0%	18
	Through	-	317	2.0%	327
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	245	3.0%	257
	Right	Yes	13	0.0%	13

Advancing Volume:	345
Opposing Volume:	270
Left Turn Volume:	18
% Left Turns in Advancing Volume:	5.22%

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	3.0%	N/A
	Through	-	0	3.0%	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

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **No**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	18
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

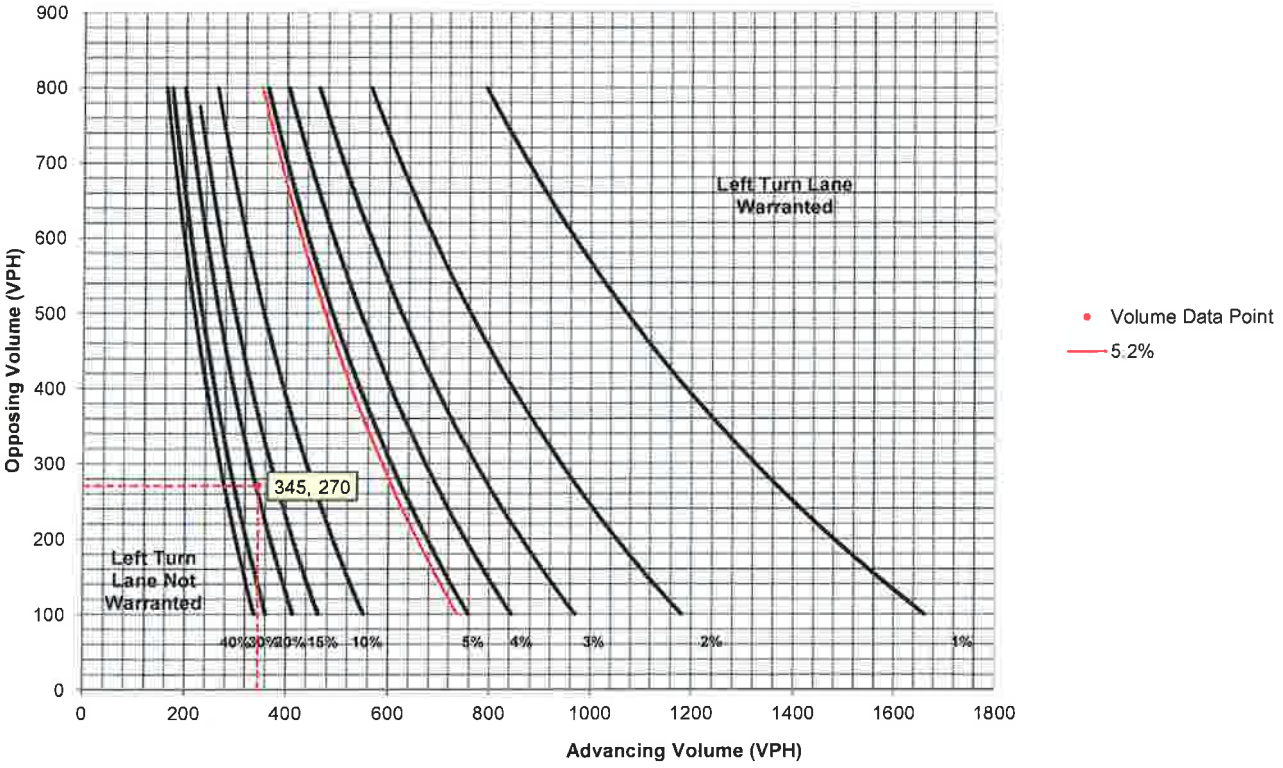
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: New Street and West Pleasant Grove Road - Alternative A
Southbound New Street Left-Turn Lane

Analysis Period:	2028 Design Year	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	19	0.0%	19
	Through	-	340	0.0%	340
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	308	0.0%	308
	Right	Yes	31	0.0%	31

Advancing Volume:	359
Opposing Volume:	339
Left Turn Volume:	19
% Left Turns in Advancing Volume:	5.29%

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

Applicable Warrant Figure: **Figure 1**

Warrant Met?: **No**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	19
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

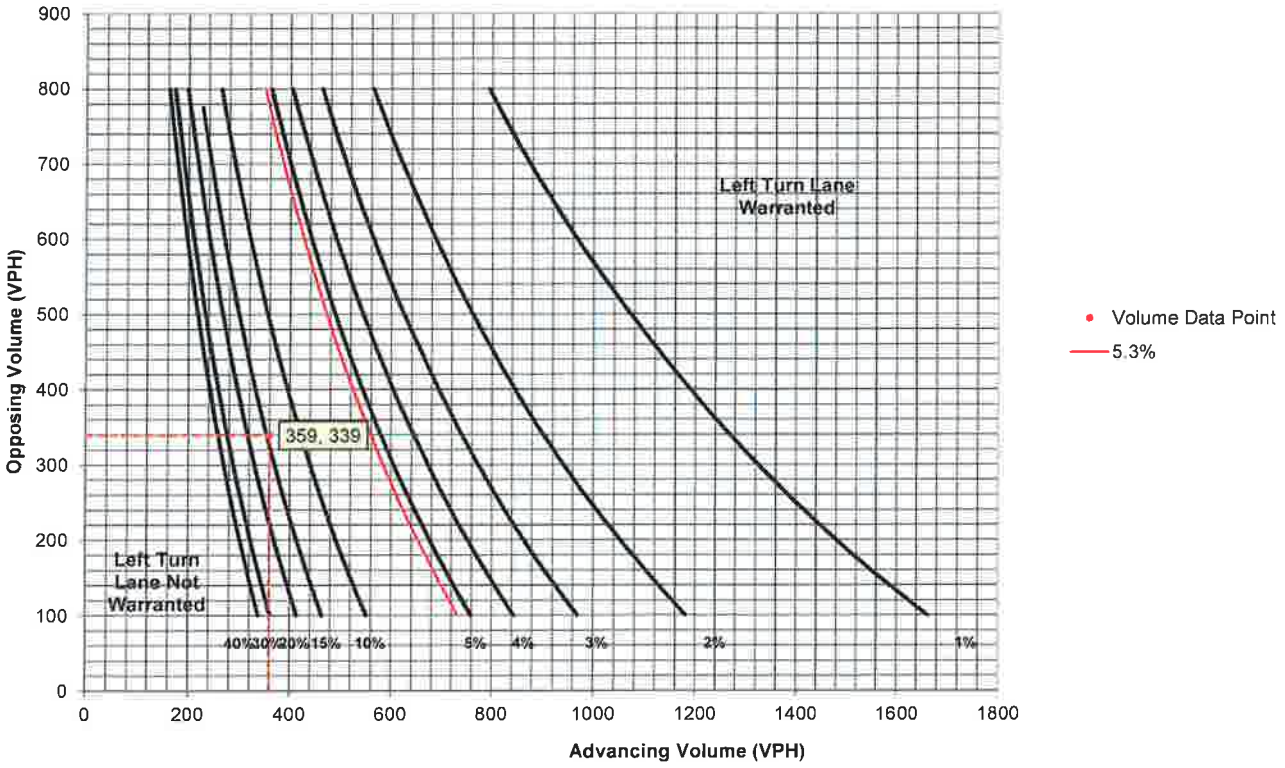
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: New Street and West Pleasant Grove Road - Alternative A
Westbound West Pleasant Grove Road Right-Turn Lane

Analysis Period:	2028 Design Year	Number of Approach Lanes:	1
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	229	1.0%	233
	Through	-	0	0.0%	0
	Right	-	41	12.0%	49

Advancing Volume:	282
Right Turn Volume:	49

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	49
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

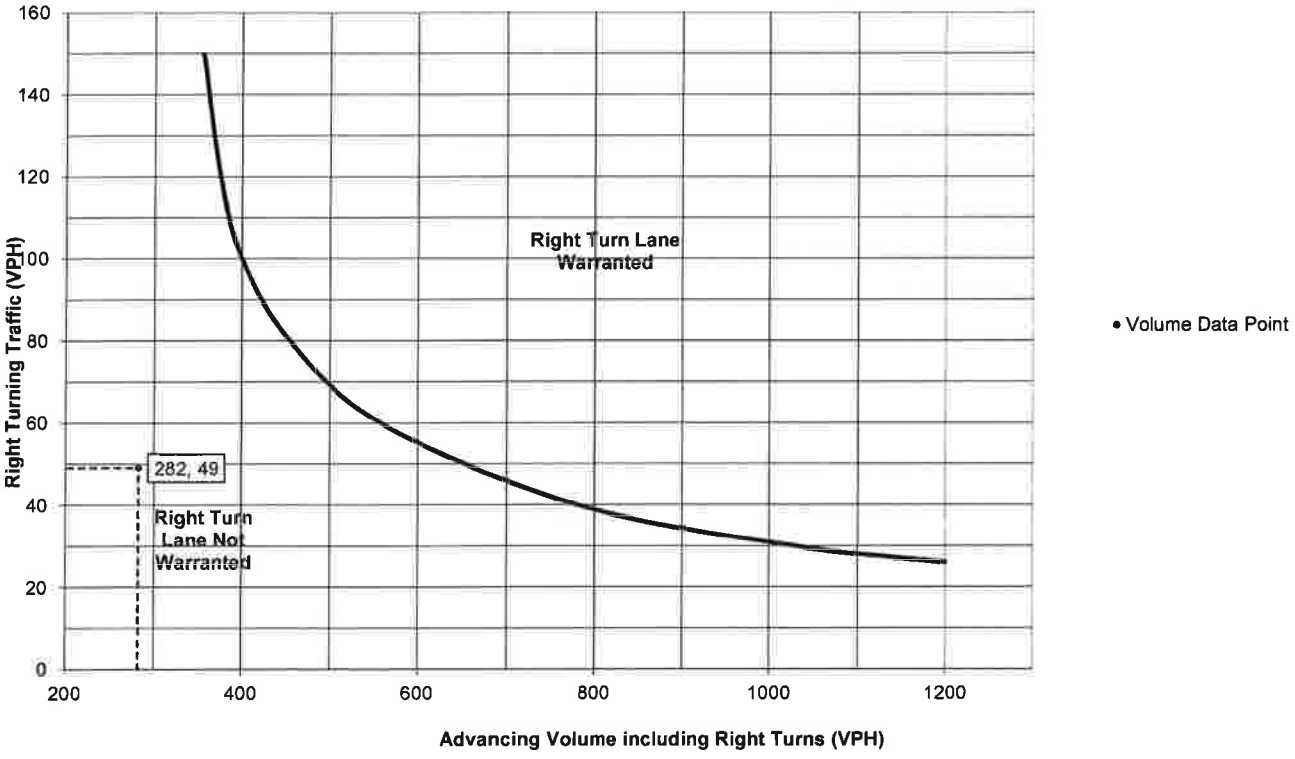
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: New Street and West Pleasant Grove Road - Alternative A
Westbound West Pleasant Grove Road Right-Turn Lane

Analysis Period:	2028 Design Year	Number of Approach Lanes:	1
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Undivided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	35		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	338	0.0%	338
	Through	-	0	0.0%	0
	Right	-	42	0.0%	42

Advancing Volume:	380
Right Turn Volume:	42

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 9**

Warrant Met?: **No**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	42
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: N/A

PennDOT Publication 46, Exhibit 11-6

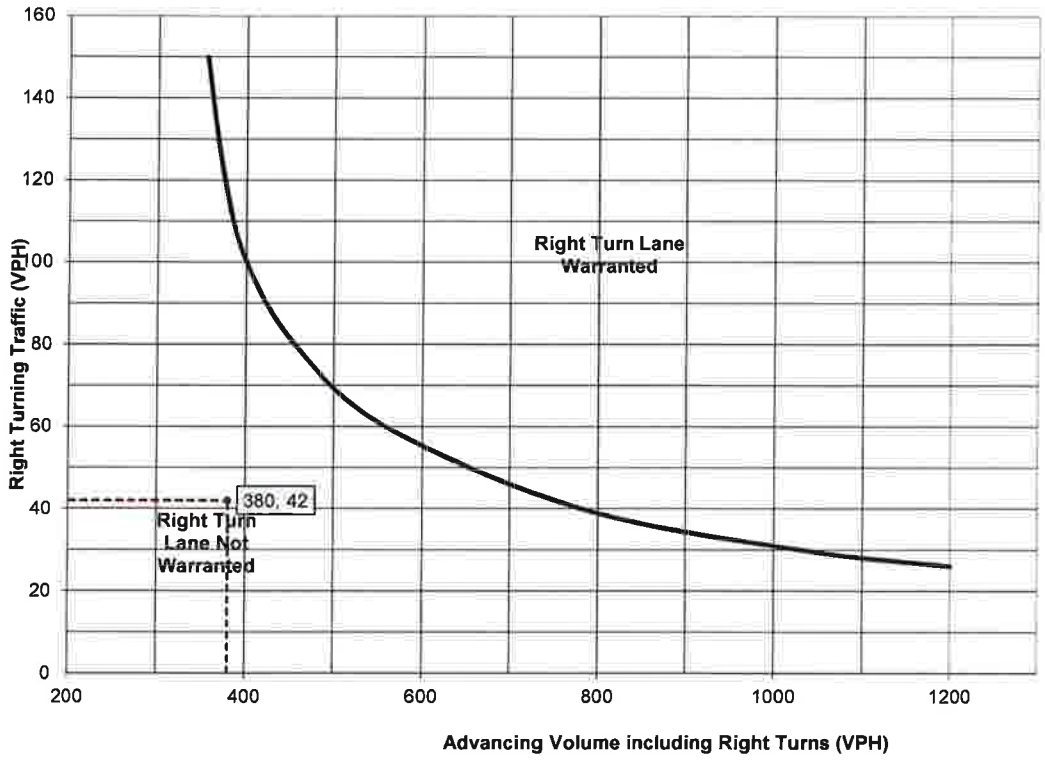
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

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

Additional Findings: N/A

Additional Comments / Justifications:

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



U.S. Route 202 (Wilmington Pike) and West Pleasant Grove Road

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: U.S. Route 202 and West Pleasant Grove Road - Alternative A
Southbound U.S. Route 202 Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	2
Design Hour:	AM Peak Hour	Undivided or Divided Highway:	Divided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	76	4.0%	N/A
	Through	-	1892	12.0%	2233
	Right	-	173	5.0%	186

Advancing Volume:	2419
Right Turn Volume:	186

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 12**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	186
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 3.0

PennDOT Publication 46, Exhibit 11-6

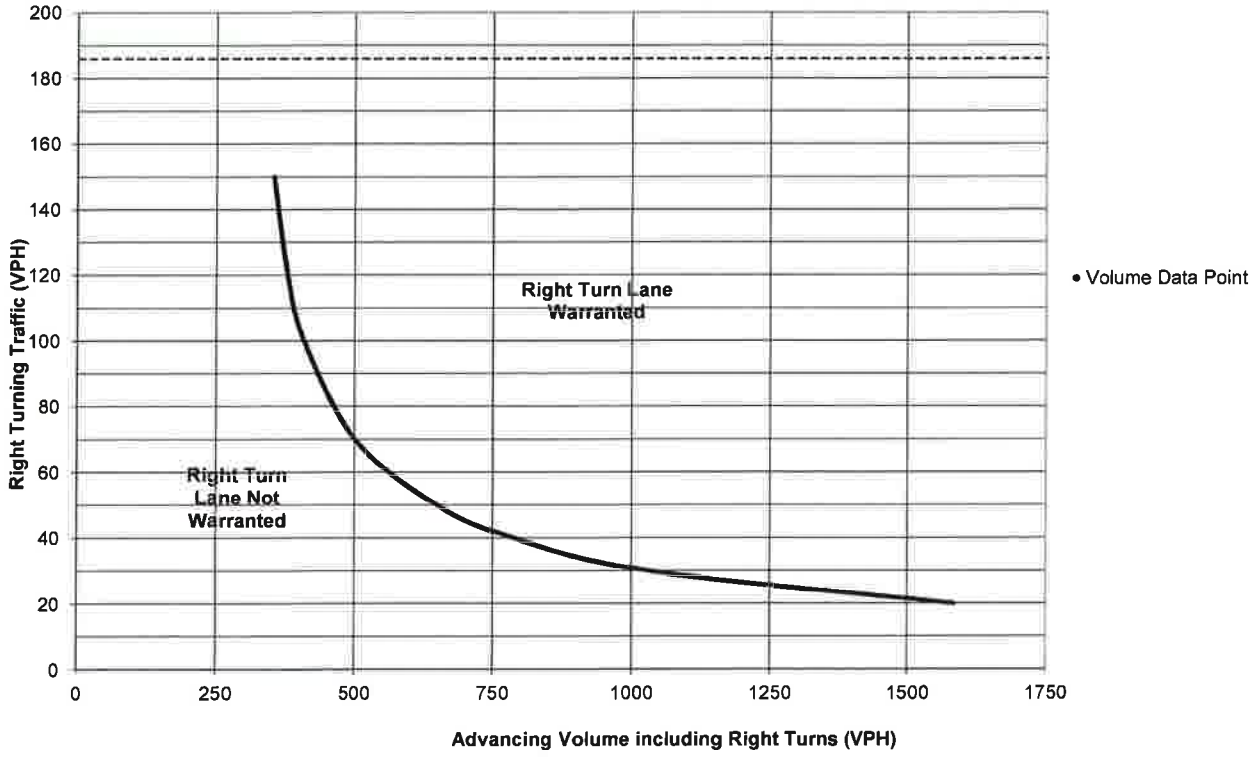
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	225	Feet
Required Right Turn Lane Storage Length:	225	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 12. Warrant for right turn lanes on four-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality:	Westtown Township	Analysis Date:	2/28/2017
County:	Chester County	Conducted By:	TML
PennDOT Engineering District:	6	Checked By:	BGG
		Agency/Company Name:	McMahon Associates, Inc.

Intersection & Approach Description: U.S. Route 202 and West Pleasant Grove Road - Alternative A
Southbound U.S. Route 202 Right-Turn Lane

Analysis Period:	2028 Design	Number of Approach Lanes:	2
Design Hour:	PM Peak Hour	Undivided or Divided Highway:	Divided
Intersection Control:	Unsignalized		
Posted Speed Limit (MPH):	45		Type of Analysis
Type of Terrain:	Rolling	Left or Right-Turn Lane Analysis?:	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	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-	0	0.0%	N/A
	Right	Yes	0	0.0%	N/A

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

Right Turn Lane Volume Calculations

Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	133	0.0%	N/A
	Through	-	2154	2.0%	2219
	Right	-	410	1.0%	417

Advancing Volume:	2636
Right Turn Volume:	417

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings

Applicable Warrant Figure: **N/A**

Warrant Met?: **N/A**

Right Turn Lane Warrant Findings

Applicable Warrant Figure: **Figure 12**

Warrant Met?: **Yes**

TURN LANE LENGTH CALCULATIONS

Intersection Control:	Unsignalized
Design Hour Volume of Turning Lane:	417
Cycles Per Hour (Assumed):	60
Cycles Per Hour (If Known):	

Average # of Vehicles/Cycle: 7.0

PennDOT Publication 46, Exhibit 11-6

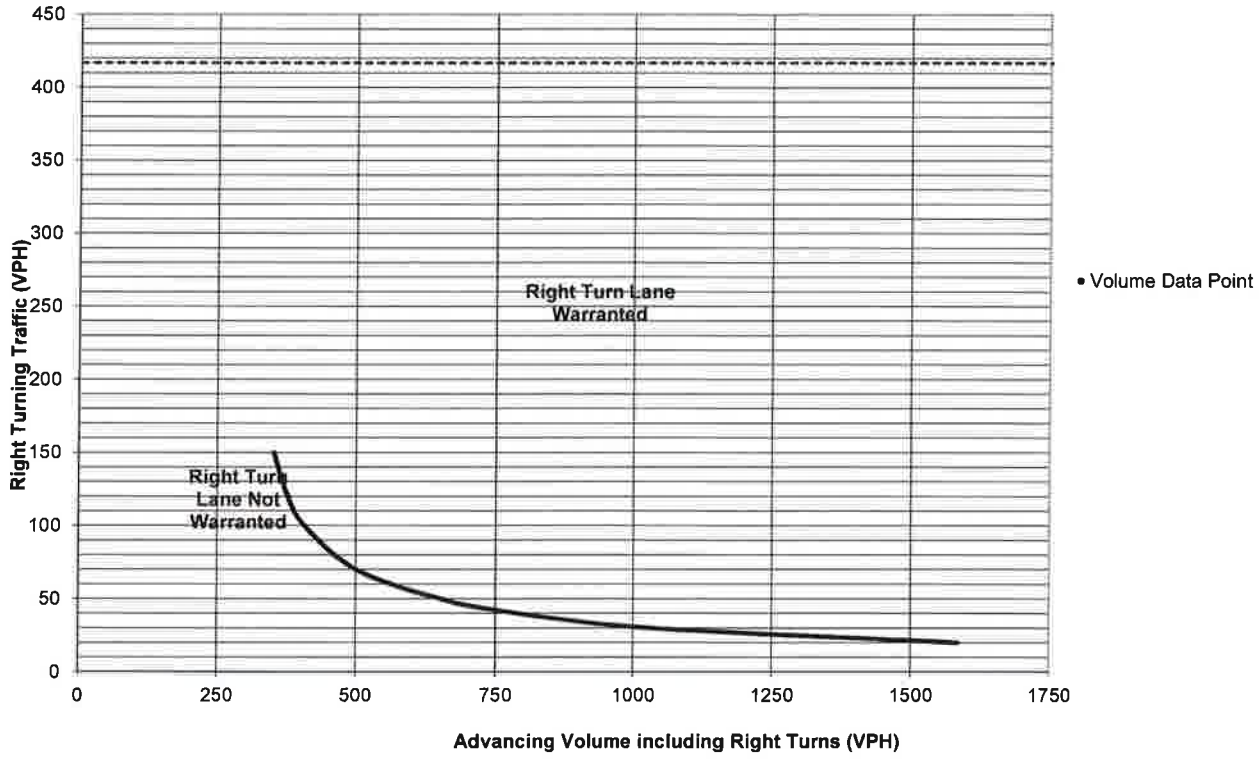
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	N/A	Feet
Condition B:	N/A	Feet
Condition C:	350	Feet
Required Right Turn Lane Storage Length:	350	Feet

Additional Findings: N/A

Additional Comments / Justifications:

Figure 12. Warrant for right turn lanes on four-lane roadways (45 mph or greater speeds, unsignalized and signalized intersections)



ATTACHMENT 6

Comment 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	66	783	5	12	369	56	3	90	28	92	274	159
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-2%			1%			-2%			1%	
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			0.983			0.971			0.956	
Flt Protected		0.995			0.999			0.999			0.994	
Satd. Flow (prot)	0	1638	0	0	1516	0	0	1588	0	0	1571	0
Flt Permitted		0.908			0.974			0.953			0.946	
Satd. Flow (perm)	0	1495	0	0	1479	0	0	1542	0	0	1498	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			18			14			26	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		819			2438			714			826	
Travel Time (s)		12.4			36.9			19.5			16.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	0%	27%	5%	6%	33%	3%	9%	4%	0%	2%
Adj. Flow (vph)	92	816	5	12	384	58	3	94	29	92	285	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	913	0	0	454	0	0	123	0	0	513	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template	Left			Left			Left	Thru		Left	Thru	
Leading Detector (ft)	30	6		30	6		30	35		30	35	
Trailing Detector (ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Position(ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Size(ft)	40	6		40	6		40	40		40	40	
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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		22.0	22.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		9.0	9.0		9.0	9.0	
Total Split (s)	62.0	62.0		62.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	68.9%	68.9%		68.9%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Gap (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	42.0	42.0		42.0	42.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	21.0	21.0		21.0	21.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
v/c Ratio		0.98			0.48			0.30			1.28	
Control Delay		39.3			10.5			26.3			172.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		39.3			10.5			26.3			172.1	
Queue Length 50th (ft)		442			118			50			~384	
Queue Length 95th (ft)		#757			187			98			#561	
Internal Link Dist (ft)		739			2358			634			746	
Turn Bay Length (ft)												
Base Capacity (vph)		947			942			404			402	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.96			0.48			0.30			1.28	

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 110
Control Type: Semi Act-Uncoord
- Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: New St & Rt 926

Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	58	783	5	12	361	56	3	90	25	69	274	159
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1818	1765	1818	1791	1655	1791	1818	1731	1818	1791	1771	1791
Adj Flow Rate, veh/h	62	816	4	12	334	55	3	94	26	62	285	166
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	8	8	8	3	3	3	0	0	0
Cap, veh/h	127	900	5	51	582	124	44	331	91	82	242	134
Arrive On Green	0.62	0.63	0.62	0.62	0.63	0.62	0.24	0.26	0.24	0.24	0.26	0.24
Sat Flow, veh/h	122	1516	7	15	1297	195	10	1314	365	140	948	525
Grp Volume(v), veh/h	942	0	0	451	0	0	123	0	0	513	0	0
Grp Sat Flow(s),veh/h/ln	1655	0	0	1603	0	0	1680	0	0	1622	0	0
Q Serve(g_s), s	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	0.0	0.0
Cycle Q Clear(g_c), s	46.8	0.0	0.0	12.0	0.0	0.0	5.4	0.0	0.0	22.0	0.0	0.0
Prop In Lane	0.10		0.00	0.03		0.12	0.02		0.21	0.12		0.32
Lane Grp Cap(c), veh/h	1074	0	0	1038	0	0	462	0	0	441	0	0
V/C Ratio(X)	0.88	0.00	0.00	0.43	0.00	0.00	0.27	0.00	0.00	1.16	0.00	0.00
Avail Cap(c_a), veh/h	1074	0	0	1038	0	0	462	0	0	441	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	13.3	0.0	0.0	8.4	0.0	0.0	27.0	0.0	0.0	34.4	0.0	0.0
Incr Delay (d2), s/veh	8.4	0.0	0.0	1.3	0.0	0.0	0.3	0.0	0.0	95.5	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	29.0	0.0	0.0	50.3	0.0	0.0	4.6	0.0	0.0	40.9	0.0	0.0
LnGrp Delay(d),s/veh	21.7	0.0	0.0	9.8	0.0	0.0	27.4	0.0	0.0	129.9	0.0	0.0
LnGrp LOS	C			A			C			F		
Approach Vol, veh/h		942			451			123			513	
Approach Delay, s/veh		21.7			9.8			27.4			129.9	
Approach LOS		C			A			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		62.0		28.0		62.0		28.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		56.0		22.0		56.0		22.0
Max Q Clear Time (g_c+I1), s		42.8		24.0		14.9		7.4
Green Ext Time (p_c), s		8.8		0.0		15.8		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	47.1
HCM 2010 LOS	D

Lane Group	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR
Lane Configurations		↔			↔			↔			↔	
Volume (vph)	99	785	5	17	377	58	9	91	27	60	277	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-2%			1%			-2%			1%	
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			0.983			0.970			0.955	
Flt Protected		0.998			0.998			0.998			0.994	
Satd. Flow (prot)	0	1638	0	0	1612	0	0	1565	0	0	1569	0
Flt Permitted		0.803			0.957			0.982			0.949	
Satd. Flow (perm)	0	1466	0	0	1450	0	0	1539	0	0	1498	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			15			15			27	
Link Speed (mph)		45			55			25			35	
Link Distance (ft)		819			2438			714			829	
Travel Time (s)		12.4			30.2			19.5			16.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	0%	22%	6%	6%	33%	3%	9%	4%	0%	2%
Adj. Flow (vph)	94	818	5	18	393	58	9	95	28	62	289	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	917	0	0	469	0	0	126	0	0	525	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left			Left			Left	Thru		Left	Thru	
Leading Detector (ft)	30	6		30	6		30	30		30	30	
Trailing Detector (ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Position(ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Size(ft)	40	6		40	6		40	40		40	40	
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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		22.0	22.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		9.0	9.0		9.0	9.0	
Total Split (s)	62.0	62.0		62.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	68.9%	68.9%		68.9%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	

McMahon Associates, Inc.
1: New St & Rt 926

Crebily Farm Residential Development
2023 with Dev Weekday Morning Peak Hour Alt A

Lane Group	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR
Minimum Gap (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	42.0	42.0		42.0	42.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	21.0	21.0		21.0	21.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
v/s Ratio		0.07			0.51			0.31			1.31	
Control Delay		41.6			11.0			26.3			184.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		41.6			11.0			26.3			184.1	
Queue Length 50th (ft)		443			125			51			~377	
Queue Length 95th (ft)		#767			200			103			#576	
Internal Link Dist (ft)		739			2358			634			749	
Turn Bay Length (ft)												
Base Capacity (vph)		941			923			404			402	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.87			0.51			0.31			1.31	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 110
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: New St & Rt 926

Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	90	735	5	17	377	56	3	91	27	60	277	187
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1818	1785	1818	1791	1851	1791	1818	1731	1818	1791	1771	1791
Adj Flow Rate, veh/h	94	816	4	18	393	55	3	95	28	62	289	274
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.90	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	6	6	6	3	3	3	0	0	0
Cap, veh/h	128	957	5	56	867	118	44	331	95	82	240	137
Arrive On Green	0.02	0.63	0.02	0.02	0.63	0.62	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	135	1511	7	26	1380	187	10	1294	372	146	938	537
Grp Volume(v), veh/h	918	0	0	466	0	0	126	0	0	525	0	0
Grp Sat Flow(s),veh/h/ln	1653	0	0	1582	0	0	1877	0	0	1622	0	0
Q Serve(g_s), s	27.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	0.0	0.0
Cycle Q Clear(g_c), s	41.3	0.0	0.0	13.5	0.0	0.0	5.5	0.0	0.0	22.0	0.0	0.0
Prop In Lane	0.10		0.00	0.04		0.12	0.02		0.22	0.12		0.33
Lane Grp Cap(c), veh/h	1072	0	0	1028	0	0	457	0	0	441	0	0
V/C Ratio(X)	0.85	0.00	0.00	0.45	0.00	0.00	0.28	0.00	0.00	1.19	0.00	0.00
Avail Cap(c_a), veh/h	1072	0	0	1028	0	0	457	0	0	441	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	13.3	0.0	0.0	8.6	0.0	0.0	27.1	0.0	0.0	34.4	0.0	0.0
Incr Delay (d2), s/veh	8.7	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.0	106.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(85%),veh/ln	23.5	0.0	0.0	10.7	0.0	0.0	4.7	0.0	0.0	63.3	0.0	0.0
LnGrp Delay(d),s/veh	22.0	0.0	0.0	10.0	0.0	0.0	27.4	0.0	0.0	140.5	0.0	0.0
LnGrp LOS	C			B			C			F		
Approach Vol, veh/h		918			466			126			525	
Approach Delay, s/veh		22.0			10.0			27.4			140.5	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		62.0		28.0		62.0		28.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		56.0		22.0		56.0		22.0
Max Q Clear Time (g_c+I1), s		43.3		24.0		15.5		7.5
Green Ext Time (p_c), s		5.3		0.0		15.1		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	50.2
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT	SBR	SEL	SET	SER
Lane Configurations												
Volume (vph)	38	851	5	12	431	61	4	93	27	65	266	173
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-2%			1%			-2%			1%	
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			0.983			0.972			0.956	
Flt Protected		0.995			0.999			0.999			0.994	
Satd. Flow (prot)	0	1838	0	0	1516	0	0	1587	0	0	1571	0
Flt Permitted		0.899			0.966			0.970			0.942	
Satd. Flow (perm)	0	1480	0	0	1469	0	0	1521	0	0	1489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			16			14			28	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		819			2436			714			826	
Travel Time (s)		12.4			36.9			19.5			16.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	3%	0%	27%	8%	6%	33%	3%	9%	4%	0%	2%
Adj. Flow (vph)	100	866	5	14	418	64	4	102	28	68	310	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	971	0	0	486	0	0	134	0	0	558	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template	Left			Left			Left	Thru		Left	Thru	
Leading Detector (ft)	20	6		20	6		20	35		20	35	
Trailing Detector (ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Position(ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Size(ft)	40	6		40	6		40	40		40	40	
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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		22.0	22.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		9.0	9.0		9.0	9.0	
Total Split (s)	62.0	62.0		62.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	68.9%	68.9%		68.9%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			6.0			5.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT	SBR	SEL	SET	SER
Minimum Gap (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	42.0	42.0		42.0	42.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	21.0	21.0		21.0	21.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
v/f Ratio		1.06			0.53			0.34			1.40	
Control Delay		64.9			11.3			27.2			222.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		64.9			11.3			27.2			222.3	
Queue Length 50th (ft)		~823			135			55			~420	
Queue Length 95th (ft)		#885			215			107			#623	
Internal Link Dist (ft)		739			2356			634			746	
Turn Bay Length (ft)												
Base Capacity (vph)		917			936			393			399	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.06			0.52			0.34			1.40	

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 110
Control Type: Semi-Act-Uncoord
- Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: New St & Rt 926

Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	26	801	9	13	401	61	4	98	27	65	298	173
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1818	1769	1818	1791	1654	1791	1818	1729	1818	1791	1771	1791
Adj Flow Rate, veh/h	108	855	4	14	428	65	4	102	28	69	319	185
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	8	8	8	3	3	3	0	0	0
Cap, veh/h	129	855	4	52	868	128	43	335	89	86	242	134
Arrive On Green	0.62	0.63	0.62	0.62	0.63	0.62	0.24	0.24	0.24	0.24	0.25	0.24
Sat Flow, veh/h	134	1507	7	17	1371	106	14	1312	350	165	940	324
Grp Volume(v), veh/h	990	0	0	493	0	0	134	0	0	556	0	0
Grp Sat Flow(s),veh/h/ln	1648	0	0	1584	0	0	1870	0	0	1826	0	0
Q Serve(g_s), s	38.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.1	0.0	0.0
Cycle Q Clear(g_c), s	58.7	0.0	0.0	14.9	0.0	0.0	5.0	0.0	0.0	22.0	0.0	0.0
Prop In Lane	0.10		0.00	0.03		0.12	0.03		0.21	0.12		0.32
Lane Grp Cap(c), veh/h	1070	0	0	1027	0	0	451	0	0	442	0	0
V/C Ratio(X)	0.93	0.00	0.00	0.48	0.00	0.00	0.30	0.00	0.00	1.26	0.00	0.00
Avail Cap(c_a), veh/h	1070	0	0	1027	0	0	451	0	0	442	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	15.0	0.0	0.0	8.8	0.0	0.0	27.2	0.0	0.0	34.4	0.0	0.0
Incr Delay (d2), s/veh	14.6	0.0	0.0	1.6	0.0	0.0	0.4	0.0	0.0	134.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	38.3	0.0	0.0	11.4	0.0	0.0	5.0	0.0	0.0	48.7	0.0	0.0
LnGrp Delay(d),s/veh	29.5	0.0	0.0	10.4	0.0	0.0	27.6	0.0	0.0	169.3	0.0	0.0
LnGrp LOS	C			B			C			F		
Approach Vol, veh/h		990			493			134			556	
Approach Delay, s/veh		29.5			10.4			27.6			169.3	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		62.0		28.0		62.0		28.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		56.0		22.0		56.0		22.0
Max Q Clear Time (g_c+I1), s		52.7		24.0		16.6		7.9
Green Ext Time (p_c), s		2.1		0.0		18.1		2.4

HCM 2010 Ctrl Delay		60.8	
HCM 2010 LOS		E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Volume (vph)	98	853	5	18	409	61	4	95	23	65	301	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-2%			1%			-2%			1%	
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			0.983			0.978			0.955	
Flt Protected		0.995			0.998			0.999			0.994	
Satd. Flow (prot)	0	1638	0	0	1512	0	0	1563	0	0	1569	0
Flt Permitted		0.886			0.953			0.988			0.943	
Satd. Flow (perm)	0	1473	0	0	1444	0	0	1515	0	0	1487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			18			15			27	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		819			2436			714			826	
Travel Time (s)		12.4			36.9			13.9			16.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	0%	27%	5%	5%	33%	3%	9%	4%	5%	2%
Adj. Flow (vph)	102	889	5	19	426	64	4	103	30	68	314	189
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	996	0	0	509	0	0	137	0	0	571	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template	Left			Left			Left	Thru		Left	Thru	
Leading Detector (ft)	30	6		30	6		30	35		30	35	
Trailing Detector (ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Position(ft)	-10	0		-10	0		-10	-5		-10	-5	
Detector 1 Size(ft)	40	6		40	6		40	40		40	40	
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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		22.0	22.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		9.0	9.0		9.0	9.0	
Total Split (s)	62.0	62.0		62.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	68.9%	68.9%		68.9%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Speed (s)	50.0	50.0		50.0	50.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Gap (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	42.0	42.0		42.0	42.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	21.0	21.0		21.0	21.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
v/c Ratio		1.07			0.55			0.34			1.43	
Control Delay		68.3			11.8			27.2			234.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		68.3			11.8			27.2			234.4	
Queue Length 50th (ft)		#634			142			56			#635	
Queue Length 95th (ft)		#674			227			108			#640	
Internal Link Dist (ft)		739			2356			634			746	
Turn Bay Length (ft)												
Base Capacity (vph)		933			920			398			400	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.07			0.55			0.34			1.43	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 120
Control Type: Semi-Act-Uncoord
- Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: New St & Rt 926

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	98	853	5	18	409	61	4	99	29	95	301	181
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1818	1765	1818	1791	1651	1791	1818	1728	1818	1791	1771	1791
Adj Flow Rate, veh/h	102	889	5	19	426	61	4	103	33	98	314	189
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	6	6	6	3	3	3	0	0	0
Cap, veh/h	131	930	4	57	830	118	45	331	34	84	239	137
Arrive On Green	0.62	0.63	0.62	0.62	0.63	0.62	0.24	0.26	0.24	0.24	0.26	0.24
Sat Flow, veh/h	138	1500	7	25	1338	187	14	1293	385	162	936	538
Grp Volume(v), veh/h	995	0	0	506	0	0	137	0	0	571	0	0
Grp Sat Flow(s),veh/h/ln	1643	0	0	1548	0	0	1673	0	0	1625	0	0
Q Serve(g_s), s	36.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	0.0	0.0
Cycle Q Clear(g_c), s	51.9	0.0	0.0	15.2	0.0	0.0	6.1	0.0	0.0	22.0	0.0	0.0
Prop In Lane	0.10		0.00	0.04		0.12	0.03		0.22	0.12		0.33
Lane Grp Cap(c), veh/h	1065	0	0	1005	0	0	450	0	0	442	0	0
V/C Ratio(X)	0.93	0.00	0.00	0.50	0.00	0.00	0.30	0.00	0.00	1.29	0.00	0.00
Avail Cap(c_a), veh/h	1065	0	0	1005	0	0	450	0	0	442	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	15.2	0.0	0.0	8.9	0.0	0.0	27.3	0.0	0.0	34.4	0.0	0.0
Incr Delay (d2), s/veh	15.5	0.0	0.0	1.8	0.0	0.0	0.4	0.0	0.0	147.3	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	27.1	0.0	0.0	11.8	0.0	0.0	5.2	0.0	0.0	52.5	0.0	0.0
LnGrp Delay(d),s/veh	30.7	0.0	0.0	10.7	0.0	0.0	27.7	0.0	0.0	181.7	0.0	0.0
LnGrp LOS	C			B			C			F		
Approach Vol, veh/h		995			506			137			571	
Approach Delay, s/veh		30.7			10.7			27.7			181.7	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		62.0		28.0		62.0		28.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		56.0		22.0		56.0		22.0
Max Q Clear Time (g_c+I1), s		53.9		24.0		17.2		8.1
Green Ext Time (p_c), s		1.8		0.0		18.4		2.5

Intersection Summary		
HCM 2010 Ctrl Delay		65.0
HCM 2010 LOS		E