



TRAFFIC PLANNING AND DESIGN, INC.

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November 9, 2022

Mr. Greg Rogalski, P.E. - *Pennoni*
Borough Engineer
Mechanicsburg Borough
36 W. Allen Street
Mechanicsburg, PA 17055

RE: Traffic Signal Warrant Analysis – Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive

Mechanicsburg Borough, Cumberland County, PA

TPD No. LMBU.0003

Dear Greg:

Traffic Planning and Design, Inc. (TPD) has completed a traffic signal warrant analysis for the intersection of Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive in conjunction with the Legacy Park development in Mechanicsburg Borough, Cumberland County, PA. See **Figure 1** for a location map. As indicated in the *Legacy Park Transportation Impact Study*, prepared by TPD, Inc, and dated February 11, 2014, it was recommended that traffic signal warrants be monitored as development progresses on-site and at the time applicable signal warrants are met a traffic signal shall be installed. However, for PennDOT to allow signalization at an intersection, a full signal warrant analysis must be conducted, and necessary warrants must be met.

Presently, the intersection of Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive is a two-way stop-controlled intersection with stop control on the eastbound and westbound Legacy Park Drive/Hemlock Drive approaches. The posted speed limit on Market Street (SR 0114) (the major street) is 35 miles per hour (mph) and the posted speed limit on Legacy Park Drive is 25 mph. Hemlock Drive and Legacy Park Drive each currently provide a single-lane approach, while Market Street (SR 0114) provides two-though lanes northbound and a single through lane southbound approaching the intersection.

The purpose of this analysis is to determine if signal warrants are currently or will be satisfied at the intersection of Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive with the remaining build-out of the proposed Legacy Park Development. For purposes of this analysis, the remaining build-out of Legacy Park was anticipated to occur by 2025 and includes construction of 160 single-family detached homes, 68 single-family attached homes, 102 multifamily (low-rise) housing units and 87 senior-adult detached homes.

EXISTING TRAFFIC CONDITIONS

A twelve-hour manual traffic count was conducted at the intersection of Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive on Tuesday, September 27th 2022 from 6:00 A.M. – 6:00 P.M.

Manual traffic count data is provided in **Appendix A**.

BASE (NO-BUILD) TRAFFIC CONDITIONS

A background growth factor for the roadways in the study area was developed based on growth factors for August 2022 to July 2023 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.59% per year in Cumberland County for urban non-interstate roadways. As such, the background growth factor was applied annually to yield overall growth percentages of 1.78% (0.59% per year, compounded over 3 years) for the 2025 build-out year.

TRIP GENERATION

The trip generation rates for the proposed development were obtained from the manual *Trip Generation*, Eleventh Edition, 2017, an Institute of Transportation Engineers (ITE) Informational Report. The data are categorized by Land Use Codes, with total vehicular trips for a given land use estimated using an independent variable and statistically generated rates or equations.

For the remaining build-out of Legacy Park, Land Use Codes 210 Single-Family (Detached), 215 Single-Family (Attached) Housing, 220 Multifamily (low-rise) housing and 251 Senior Adult (Detached) Housing from the *Trip Generation Manual* was used to calculate the number of vehicular trips the development will generate during the Average Weekday.

Trip generation calculations are provided in **Appendix B**.

TRIP DISTRIBUTION

The distribution of new trips generated by the proposed development were based on the trip distributions assumed in the *Legacy Park Transportation Impact Study*. The new trips associated with the remaining build-out of the development were distributed assuming 55% of the trips would use the Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive intersection to enter/exit the site. Excerpts from the approved Legacy Park Transportation Impact Study are provided in **Appendix E**.

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

TPD estimated the traffic volumes at the subject intersection and developed 12-hours of future traffic volumes by using the Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use from the *ITE Trip Generation Manual, 11th Edition* and the trip generation and distribution assumptions contained in this study.

The site-generated trips for the remaining build-out of the proposed development were added to the 2025 base (no-build) condition traffic volumes to calculate 2025 projected (build) condition traffic volumes. Traffic volume development worksheets are included in **Appendix C**.

TRAFFIC SIGNAL WARRANT ANALYSIS

The traffic signal warrant analysis was conducted at the intersection in accordance with PennDOT Publication 212, *Official Traffic Control Devices*, Subchapter D, "Highway Traffic Signals" and the 2009 MUTCD.

TPD examined traffic volumes at the intersection to determine if the following MUTCD signal warrants will be satisfied based on 2022 existing traffic volumes and 2025 design year traffic volume projections with full build-out of the development:

- » Warrant 1, Eight-Hour Vehicular Volumes Warrant
 - Warrant 1A, Minimum Vehicular Volume;
 - Warrant 1B, Interruption of Continuous Traffic;
- » Warrant 2, Four-Hour Vehicular Volume Warrant;
- » Warrant 3, Peak Hour Volume Warrant.

Warrant 1 Eight-Hour Volume Warrant

Warrant 1A - Minimum Vehicular Volume

Warrant 1A, Minimum Vehicular Volume, is satisfied when, for each of any 8 hours of an average day, the traffic volumes on the major street exceed 500 vehicles per hour (both approaches) and the traffic volumes on the higher volume minor street or driveway approach to the intersection equal or exceed 150 vehicles per hour (one approach).

Warrant 1B - Interruption of Continuous Traffic

Warrant 1B, Interruption of Continuous Traffic, is satisfied when, for each of any 8 hours of an average day, the traffic volumes on the major street exceed 750 vehicles per hour (both approaches) and the traffic volumes on the higher volume minor street or driveway approach to the intersection equal or exceed 75 vehicles per hour (one approach).

Warrant 2 Four-Hour Volume Warrant

Warrant 2, Four-Hour Volume, is satisfied when for each of any four hours of an average day, the volumes are plotted on a graph which is provided as part of the warrant. If the plotted points all fall above the curve on the graph, then the warrant is met.

Warrant 3 Peak Hour Volume Warrant

Warrant 3, Peak Hour Volume, is intended for application when traffic conditions are such that for one hour of the day minor street traffic suffers undue delay in entering or crossing the major street. To determine if the warrant is met, the volumes for both roadways are plotted on a graph which is provided as part of the warrant. If the plotted point falls above the curve on the graph, then the warrant is met.

Signal Warrant Analysis Results

Existing (2022) Conditions

Based on existing condition traffic volumes obtained in September 2022, the results of the existing warrant analysis are as follows:

- Warrant 1A: exceeds threshold volumes for 0 hour, 8 hours needed (**Not Satisfied**);
- Warrant 1B: exceeds threshold volumes for 0 hours, 8 hours needed (**Not Satisfied**);
- Warrant 2: exceeds threshold volumes for 0 hours, 4 hours needed (**Not Satisfied**);
- Warrant 3: exceeds threshold volumes for 0 hours (**Not Satisfied**).

Projected (2025) Conditions with full build-out of Legacy Park

Based on the preliminary traffic analyses performed utilizing the 2025 build-out year traffic volume projections with development of the proposed site, the results of the warrant analysis are as follows:

- Warrant 1A: exceeds threshold volumes for 1 hour, 8 hours needed (**Not Satisfied**);
- Warrant 1B: exceeds threshold volumes for 11 hours, 8 hours needed (**Satisfied**);
- Warrant 2: exceeds threshold volumes for 6 hours, 4 hours needed (**Satisfied**);
- Warrant 3: exceeds threshold volumes for 4 hours (**Satisfied**).

As outlined above, traffic signal warrants are not currently satisfied, however (Warrants 1B, 2, & 3) may be satisfied at the intersection of Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive under 2025 Projected (Build) conditions. Relevant signal warrant analyses worksheets are included in **Appendix D**. Based on initial evaluation, it appears that a signal warrant might be initially triggered at the subject intersection after Phase 3 of Legacy Park is fully built-out and the initial lots with Phase 4 are built and occupied.

ONE-WAY CONVERSION ASSESSMENT

At the request of the Borough, TPD completed an assessment of the proposed one-way circulation plan within Legacy Park to determine if the conversion could result in any substantial modifications to distribution of traffic or the recommendations/conclusions in the approved *Legacy Park Transportation Impact Study*. As shown on the current traffic circulation plan the following roadways are proposed to be designated as one-way roads within Legacy Park:

- Internal Roundabouts – counter clockwise;
- Wright Drive (from Despania Drive to Norway Street) – Eastbound;
- Morris Drive (from Estate Drive to Norway Street) – Westbound;
- Integrity Drive/Midway Drive/East View Drive (Morris Dr. to Morris Dr.) – Eastbound.

Based on review of the subject one-way segments, each segment has a number of alternative streets to enter and exit the one-way system and allows for access to every site access location (i.e. Norway Street, Market Street, Allendale Road, Despania Drive). Furthermore, there are multiple two-way connections along the one-way sections, which gives residents/motorist multiple opportunities to access north/south/east/west routes without driving significantly out of the way. As such, TPD does not believe that the one-way configuration will result in traffic distribution that differs from the 2014 approved TIS, nor will it cause a higher percentage of traffic to use Despania, Norway or other local streets compared to assumptions made in the approved TIS.

In addition, given the relatively short distance (less than 1,000') of the one-way streets and intersections with alternate two-way streets, emergency vehicles are not likely to be hindered/delayed by the one-way street system.

CONCLUSIONS AND RECOMMENDATIONS

- Based on this signal warrant analysis, signal warrants are not currently satisfied at the intersection of Market Street (SR 0114) and Legacy Park Drive/Hemlock Drive, however may be satisfied upon full build-out of Legacy Park. Therefore, a traffic signal cannot be installed at this intersection at this time, but consideration should be given to continually monitoring signal warrants as development progresses. Based on initial evaluation, it appears that a

signal warrant might be initially triggered at the subject intersection after Phase 3 of Legacy Park is fully built-out and the initial lots with Phase 4 are built and occupied.

- Per review of the traffic circulation plan the proposed one-way street system provides adequate access for two-way streets, site access locations and emergency vehicle access. The one-way segments are not anticipated to have any significant impact on the recommendations or conclusions contained in the approved Legacy Park Transportation Impact Study, nor will those segments lead to a higher distribution of traffic onto local streets relative to the assumptions in the approved TIS.

We appreciate your review of the enclosed information. Additionally, if there are any questions or comments, please call at any time.

Sincerely,

TRAFFIC PLANNING AND DESIGN, INC.



Jason T. Wheeler, PTP

Project Manager

Jwheeler@TrafficPD.com

Attachments:

- Appendix A - Traffic Count Data
- Appendix B – Legacy Park Phasing Plan (Remaining Build-Out) Trip Generation
- Appendix C – Volume Development
- Appendix D – Signal Warrant Analysis Worksheets
- Appendix E – Excerpts from *Legacy Park Transportation Impact Study*
- Appendix F – Phasing/Circulation Plans



Appendix A

Traffic Count Data



Traffic Planning and Design, Inc
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Count Name: 12 Count S Market Street (SR 0114) & Despina Drive/Hemlock Drive
Site Code: S Market Street (SR 0114) & Despina Drive/Hemlock
Start Date: 09/27/2022
Page No: 1

Turning Movement Data

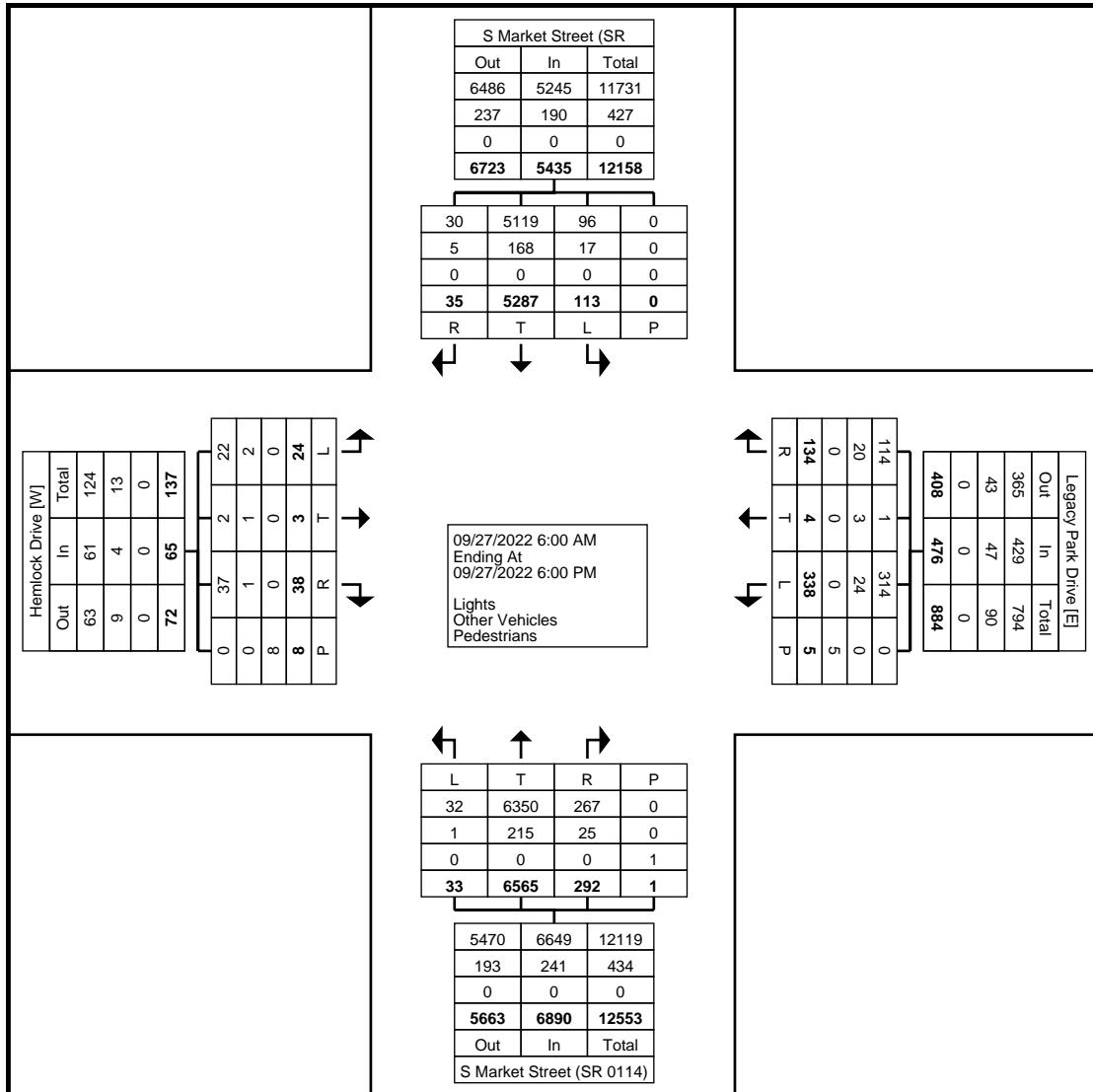
Start Time	Hemlock Drive Eastbound					Legacy Park Drive Westbound					S Market Street (SR 0114) Northbound					S Market Street (SR 0114)) Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
6:00 AM	0	0	1	0	1	5	0	0	0	5	1	39	2	0	42	2	34	1	0	37	85
6:15 AM	0	0	0	0	0	4	0	2	0	6	0	58	7	0	65	1	49	0	0	50	121
6:30 AM	0	0	0	0	0	3	0	3	0	6	0	79	4	0	83	0	69	1	0	70	159
6:45 AM	1	0	0	0	1	8	0	5	0	13	0	114	4	0	118	0	86	0	0	86	218
Hourly Total	1	0	1	0	2	20	0	10	0	30	1	290	17	0	308	3	238	2	0	243	583
7:00 AM	1	0	4	0	5	11	0	6	0	17	1	142	2	0	145	3	74	0	0	77	244
7:15 AM	2	0	1	0	3	10	0	3	1	13	0	180	4	0	184	2	90	0	0	92	292
7:30 AM	0	0	0	0	0	17	0	3	1	20	0	192	2	0	194	2	179	1	0	182	396
7:45 AM	1	0	2	0	3	8	0	4	0	12	1	195	4	0	200	2	162	2	0	166	381
Hourly Total	4	0	7	0	11	46	0	16	2	62	2	709	12	0	723	9	505	3	0	517	1313
8:00 AM	0	0	2	1	2	10	0	7	0	17	0	165	6	0	171	5	132	1	0	138	328
8:15 AM	2	0	4	2	6	11	0	3	2	14	1	141	8	0	150	4	115	1	0	120	290
8:30 AM	0	0	2	0	2	1	0	5	0	6	0	127	9	0	136	1	98	1	0	100	244
8:45 AM	0	1	0	0	1	6	0	4	0	10	0	134	7	0	141	0	80	0	0	80	232
Hourly Total	2	1	8	3	11	28	0	19	2	47	1	567	30	0	598	10	425	3	0	438	1094
9:00 AM	0	0	0	0	0	4	0	2	1	6	0	103	6	1	109	5	83	0	0	88	203
9:15 AM	0	0	0	0	0	8	0	0	0	8	0	112	4	0	116	2	89	0	0	91	215
9:30 AM	0	1	2	0	3	7	0	2	0	9	1	111	2	0	114	1	91	2	0	94	220
9:45 AM	0	0	0	0	0	7	0	3	0	10	0	98	6	0	104	2	92	0	0	94	208
Hourly Total	0	1	2	0	3	26	0	7	1	33	1	424	18	1	443	10	355	2	0	367	846
10:00 AM	0	0	1	0	1	4	0	4	0	8	0	110	2	0	112	1	63	2	0	66	187
10:15 AM	0	0	1	0	1	4	0	1	0	5	0	124	9	0	133	2	89	1	0	92	231
10:30 AM	0	0	0	0	0	8	0	1	0	9	3	102	10	0	115	2	80	0	0	82	206
10:45 AM	0	0	0	1	0	2	0	3	0	5	1	117	3	0	121	3	74	0	0	77	203
Hourly Total	0	0	2	1	2	18	0	9	0	27	4	453	24	0	481	8	306	3	0	317	827
11:00 AM	0	0	0	0	0	5	0	3	0	8	0	116	1	0	117	2	105	0	0	107	232
11:15 AM	0	0	0	0	0	2	0	0	0	2	0	128	5	0	133	2	106	1	0	109	244
11:30 AM	0	0	1	0	1	8	1	1	0	10	0	131	6	0	137	0	86	0	0	86	234
11:45 AM	1	0	2	0	3	7	0	3	0	10	1	116	4	0	121	2	107	0	0	109	243
Hourly Total	1	0	3	0	4	22	1	7	0	30	1	491	16	0	508	6	404	1	0	411	953
12:00 PM	0	0	2	0	2	6	0	4	0	10	2	100	6	0	108	1	96	0	0	97	217
12:15 PM	0	1	0	2	1	10	0	0	0	10	0	130	1	0	131	0	97	0	0	97	239
12:30 PM	1	0	0	0	1	3	0	2	0	5	0	112	4	0	116	3	97	1	0	101	223
12:45 PM	1	0	1	0	2	7	1	2	0	10	0	119	4	0	123	3	99	2	0	104	239
Hourly Total	2	1	3	2	6	26	1	8	0	35	2	461	15	0	478	7	389	3	0	399	918
1:00 PM	2	0	0	0	2	6	0	0	0	6	2	109	6	0	117	3	106	0	0	109	234
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1:30 PM	0	0	0	0	0	5	1	0	0	6	3	113	1	0	117	1	124	0	0	125	248
1:45 PM	0	0	1	0	1	8	0	2	0	10	1	134	1	0	136	2	84	0	0	86	233
Hourly Total	2	0	2	0	4	23	1	3	0	27	6	472	13	0	491	8	407	1	0	416	938
2:00 PM	0	0	1	0	1	5	0	3	0	8	0	126	6	0	132	5	96	1	0	102	243
2:15 PM	0	0	0	0	0	8	0	3	0	11	0	142	12	0	154	1	119	1	0	121	286
2:30 PM	2	0	3	0	5	8	0	5	0	13	1	176	5	0	182	1	131	1	0	133	333
2:45 PM	0	0	0	0	0	12	0	4	0	16	1	129	8	0	138	5	136	2	0	143	297
Hourly Total	2	0	4	0	6	33	0	15	0	48	2	573	31	0	606	12	482	5	0	499	1159
3:00 PM	0	0	1	0	1	10	0	2	0	12	2	158	3	0	163	6	154	1	0	161	337
3:15 PM	0	0	0	1	0	6	0	1	0	7	1	162	8	0	171	1	162	1	0	164	342
3:30 PM	1	0	1	0	2	9	0	6	0	15	0	192	12	0	204	2	151	2	0	155	376
3:45 PM	2	0	0	0	2	17	0	1	0	18	1	182	11	0	194	2	128	0	0	130	344
Hourly Total	3	0	2	1	5	42	0	10	0	52	4	694	34	0	732	11	595	4	0	610	1399
4:00 PM	1	0	0	0	1	5	1	4	0	10	1	189	13	0	203	3	159	1	0	163	377
4:15 PM	0	0	0	0	0	8	0	2	0	10	1	173	8	0	182	2	126	3	0	131	323
4:30 PM	0	0	0	0	0	6	0	3	0	9	1	174	12	0	187	5	146	0	0	151	347
4:45 PM	1	0	0	0	1	10	0	3	0	13	2	202	8	0	212	3	152	2	0	157	383
Hourly Total	2	0	0	0	2	29	1	12	0	42	5	738	41	0	784	13	583	6	0	602	1430
5:00 PM	4	0	2	1	6	4	0	1	0	5	2	198	15	0	215	3	187	1	0	191	417
5:15 PM	1	0	1	0	2	8	0	3	0	11	1	170	8	0	179	2	151	0	0	153	345
5:30 PM	0	0	1	0	1	7	0	8	0	15	1	173	7	0	181	6	153	1	0	160	357
5:45 PM	0	0	0	0	0	6	0	6	0	12	0	152	11	0	163	5	107	0	0	112	287
Hourly Total	5	0	4	1	9	25	0	18	0	43	4	693	41	0	738	16	598	2	0	616	1406

Grand Total	24	3	38	8	65	338	4	134	5	476	33	6565	292	1	6890	113	5287	35	0	5435	12866
Approach %	36.9	4.6	58.5	-	-	71.0	0.8	28.2	-	-	0.5	95.3	4.2	-	-	2.1	97.3	0.6	-	-	-
Total %	0.2	0.0	0.3	-	0.5	2.6	0.0	1.0	-	3.7	0.3	51.0	2.3	-	53.6	0.9	41.1	0.3	-	42.2	-
Lights	22	2	37	-	61	314	1	114	-	429	32	6350	267	-	6649	96	5119	30	-	5245	12384
% Lights	91.7	66.7	97.4	-	93.8	92.9	25.0	85.1	-	90.1	97.0	96.7	91.4	-	96.5	85.0	96.8	85.7	-	96.5	96.3
Other Vehicles	2	1	1	-	4	24	3	20	-	47	1	215	25	-	241	17	168	5	-	190	482
% Other Vehicles	8.3	33.3	2.6	-	6.2	7.1	75.0	14.9	-	9.9	3.0	3.3	8.6	-	3.5	15.0	3.2	14.3	-	3.5	3.7
Pedestrians	-	-	-	8	-	-	-	-	5	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-



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Count Name: 12 Count S Market Street (SR 0114) & Despina Drive/Hemlock Drive
Site Code: S Market Street (SR 0114) & Despina Drive/Hemlock
Start Date: 09/27/2022
Page No: 3



Turning Movement Data Plot



Traffic Planning and Design, Inc
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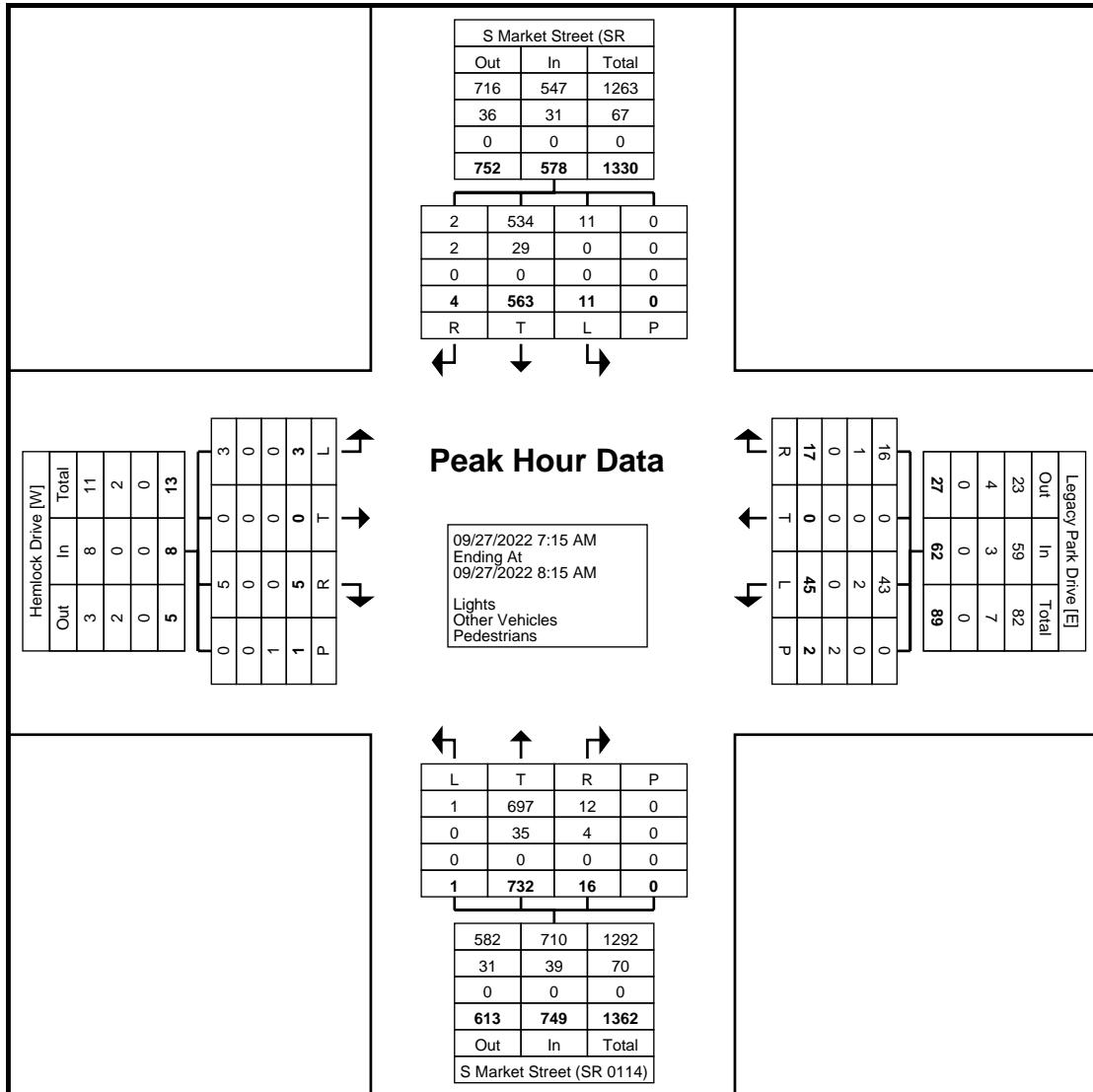
Count Name: 12 Count S Market
Street (SR 0114) & Despina
Drive/Hemlock Drive
Site Code: S Market Street (SR
0114) & Despina Drive/Hemlock
Start Date: 09/27/2022
Page No: 4

Turning Movement Peak Hour Data (7:15 AM)



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Count Name: 12 Count S Market Street (SR 0114) & Despina Drive/Hemlock Drive
 Site Code: S Market Street (SR 0114) & Despina Drive/Hemlock
 Start Date: 09/27/2022
 Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)



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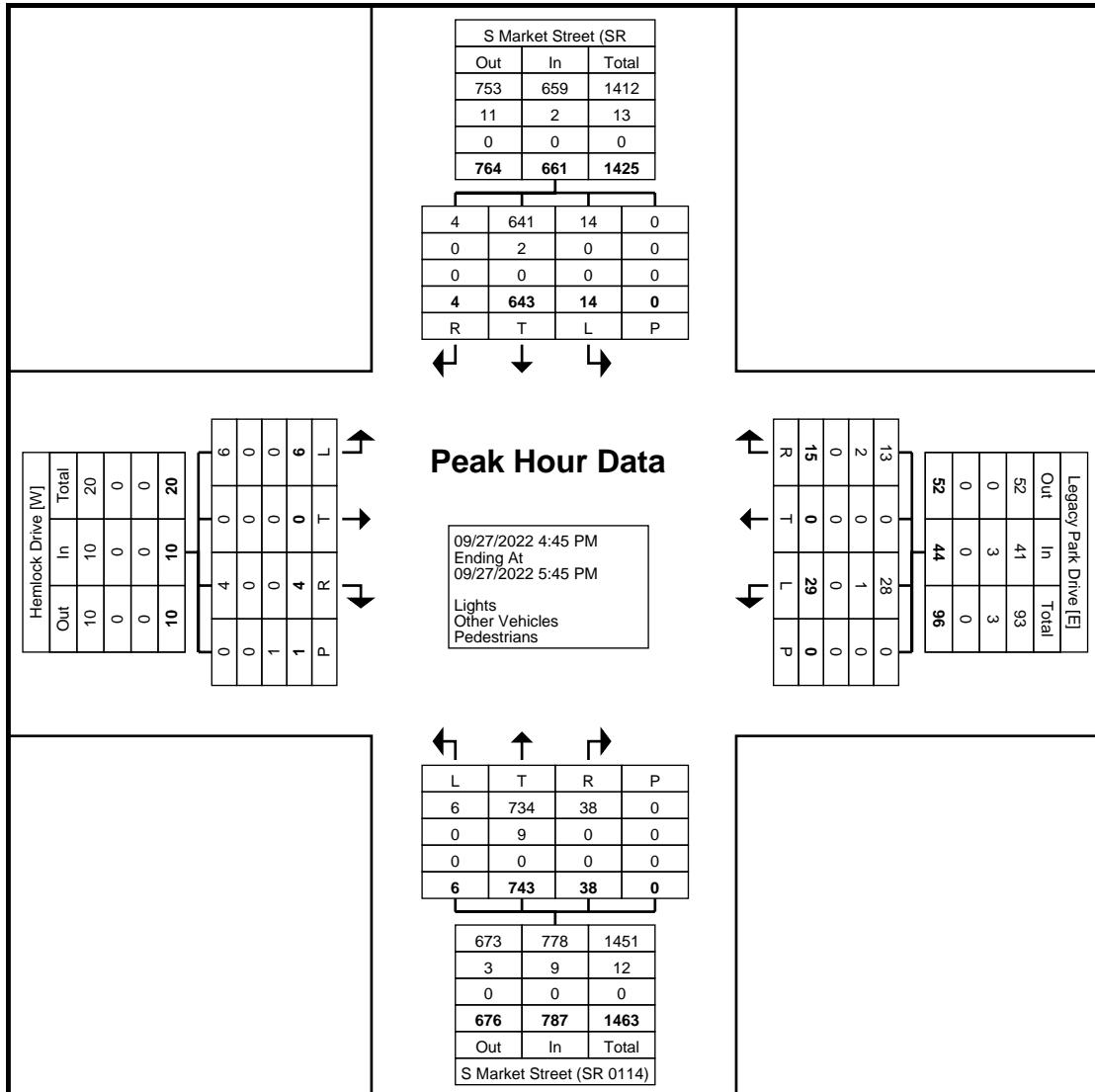
Count Name: 12 Count S Market
Street (SR 0114) & Despina
Drive/Hemlock Drive
Site Code: S Market Street (SR
0114) & Despina Drive/Hemlock
Start Date: 09/27/2022
Page No: 6

Turning Movement Peak Hour Data (4:45 PM)



Traffic Planning and Design, Inc
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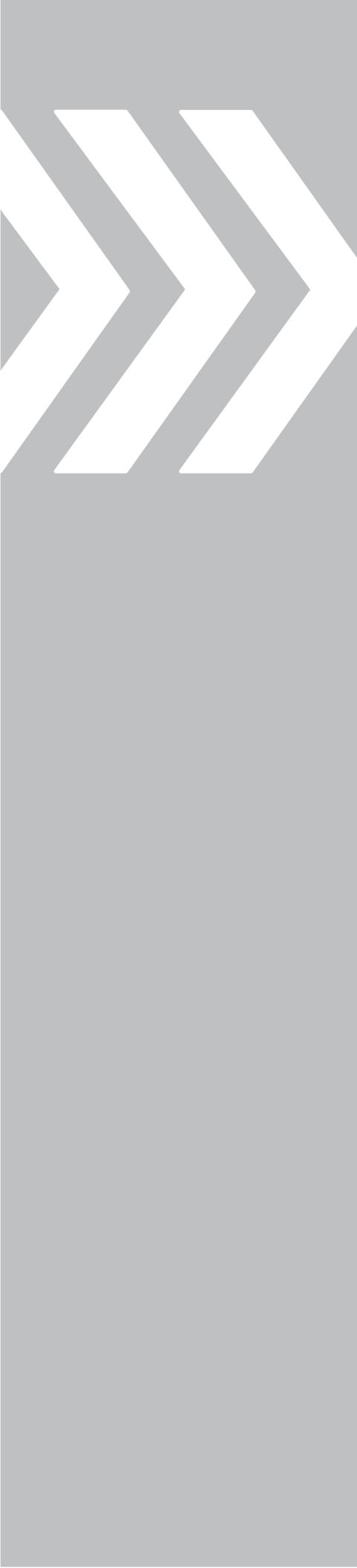
Count Name: 12 Count S Market Street (SR 0114) & Despina Drive/Hemlock Drive
Site Code: S Market Street (SR 0114) & Despina Drive/Hemlock
Start Date: 09/27/2022
Page No: 7



Peak Hour Data

09/27/2022 4:45 PM
Ending At
09/27/2022 5:45 PM
Lights
Other Vehicles
Pedestrians

Turning Movement Peak Hour Data Plot (4:45 PM)



Appendix B

Trip Generation

(Remaining Build-Out)

Date: 10/26/22

Project: Legacy Park

TPD #: LMBU.0003

Trip Generation Calculations:

Remaining Build-Out

Average Weekday

Land Use	ITE #	Size (X)		Rate/Equation		Total Trips			
				a	b	Total	Enter %	Enter	Exit
Single Family Detached Homes	210	160	Units	0.92	2.68	1555	50%	778	777
Senior Adult Housing - SF Detached	251	87	Units	0.85	2.47	526	50%	263	263
multifamily (low-rise) housing	220	102	Units	6.41	75.31	729	50%	365	364
Single Family Attached Homes	215	68	Units	7.62	-50.48	468	50%	234	234
Total					3278		1640	1638	



Appendix C

Volume Development

Hourly Distribution of Entering and Exiting Vehicle

Trips by Land Use

Source: ITE Trip Generation Manual, 11th Edition

Land Use Code	210				Based on 160 dwelling units
Land Use	Single-Family Detached Housing				
Setting	General Urban/Suburban				
Time Period	Weekday				
Trip Type	New Trips			Enter	
# Data Sites	7		Total Trips	778	Exit
	% of 24-Hour Traffic			777	
Time	Entering	Exiting	Entering	Exiting	
6-7 AM	1.6	5.8	12	45	
7-8 AM	3.1	10.0	24	78	
8-9 AM	3.8	8.5	30	66	
9-10 AM	3.3	5.8	26	45	
10-11 AM	4.2	5.6	33	44	
11-12 PM	5.4	5.1	42	40	
12-1 PM	5.7	5.7	44	44	
1-2 PM	6.1	6.0	47	47	
2-3 PM	7.1	6.1	55	47	
3-4 PM	8.7	6.2	68	48	
4-5 PM	10.5	7.4	82	57	
5-6 PM	10.0	7.3	78	57	

Hourly Distribution of Entering and Exiting Vehicle

Trips by Land Use

Source: ITE Trip Generation Manual, 11th Edition

Land Use Code	215			
Land Use	Single-Family Attached Housing			
Setting	General Urban/Suburban			
Time Period	Weekday			
Trip Type	New Trips			
# Data Sites	7			
	% of 24-Hour Traffic		Total Trips	
Time	Entering	Exiting	Entering	Exiting
6-7 AM	1.1	5.8	3	14
7-8 AM	2.7	13.2	6	31
8-9 AM	3.8	9.3	9	22
9-10 AM	3.7	6.9	9	16
10-11 AM	4.0	4.3	9	10
11-12 PM	4.8	5.7	11	13
12-1 PM	5.4	5.1	13	12
1-2 PM	4.5	4.8	11	11
2-3 PM	5.5	6.0	13	14
3-4 PM	8.2	4.8	19	11
4-5 PM	9.8	5.1	23	12
5-6 PM	12.1	6.8	28	16

Based on 68 dwelling units

Enter

234

Exit

234

Hourly Distribution of Entering and Exiting Vehicle

Trips by Land Use

Source: ITE Trip Generation Manual, 11th Edition

Land Use Code	220				Based on 102 dwelling units			
Land Use	Multifamily Housing (Low-Rise)							
Setting	General Urban/Suburban							
Time Period	Weekday							
Trip Type	New Trips				Enter	Exit		
# Data Sites	6				365	364		
	% of 24-Hour Traffic		Total Trips					
Time	Entering	Exiting	Entering	Exiting				
6-7 AM	1.4	6.9	5	25				
7-8 AM	2.0	10.8	7	39				
8-9 AM	3.1	8.5	11	31				
9-10 AM	2.9	4.9	11	18				
10-11 AM	2.4	4.8	9	17				
11-12 PM	3.8	4.7	14	17				
12-1 PM	4.5	4.1	16	15				
1-2 PM	4.0	4.4	15	16				
2-3 PM	5.6	4.9	20	18				
3-4 PM	6.9	5.3	25	19				
4-5 PM	10.1	5.6	37	20				
5-6 PM	11.4	7.6	42	28				

Hourly Distribution of Entering and Exiting Vehicle

Trips by Land Use

Source: ITE Trip Generation Manual, 11th Edition

Land Use Code	251				Based on 87 dwelling units	
Land Use	Senior Adult Housing - Single-Family					
Setting	General Urban/Suburban					
Time Period	Weekday					
Trip Type	New Trips					
# Data Sites	8					
	% of 24-Hour Traffic		Total Trips			
Time	Entering	Exiting	Entering	Exiting	Enter 263 Exit 263	
6-7 AM	1.0	3.7	3	10		
7-8 AM	2.8	8.0	7	21		
8-9 AM	3.9	8.8	10	23		
9-10 AM	5.2	8.4	14	22		
10-11 AM	6.1	8.1	16	21		
11-12 PM	7.1	7.9	19	21		
12-1 PM	7.8	7.9	21	21		
1-2 PM	7.3	7.3	19	19		
2-3 PM	7.8	7.0	21	18		
3-4 PM	9.0	6.8	24	18		
4-5 PM	9.4	6.2	25	16		
5-6 PM	9.4	6.1	25	16		

Hourly Distribution of Entering and Exiting Vehicle Trips

Legacy Park Remaining Build-Out			Movement Trip Distribution %	Entering Trips		Exiting Trips	
Time	Entering	Total Trips		SB L 25%	NB R 30%	WB L 30%	WB R 25%
6-7 AM	23	93	6-7 AM	6	7	28	23
7-8 AM	45	169	7-8 AM	11	14	51	42
8-9 AM	60	142	8-9 AM	15	18	43	35
9-10 AM	59	101	9-10 AM	15	18	30	25
10-11 AM	67	92	10-11 AM	17	20	28	23
11-12 PM	86	91	11-12 PM	21	26	27	23
12-1 PM	94	92	12-1 PM	23	28	28	23
1-2 PM	92	93	1-2 PM	23	28	28	23
2-3 PM	109	98	2-3 PM	27	33	29	24
3-4 PM	136	97	3-4 PM	34	41	29	24
4-5 PM	166	106	4-5 PM	42	50	32	27
5-6 PM	172	116	5-6 PM	43	52	35	29

Hourly Distribution of Entering and Exiting Vehicle Trips

Remaining Build-out of Legacy Park

Movement	SB L	NB R	WB R	WB L
Time				
6-7 AM	6	7	23	28
7-8 AM	11	14	42	51
8-9 AM	15	18	35	43
9-10 AM	15	18	25	30
10-11 AM	17	20	23	28
11-12 PM	21	26	23	27
12-1 PM	23	28	23	28
1-2 PM	23	28	23	28
2-3 PM	27	33	24	29
3-4 PM	34	41	24	29
4-5 PM	42	50	27	32
5-6 PM	43	52	29	35

Hourly Volume Development for Signal Warrant Analysis

2022 Existing Volumes						S. Market Street (SR 0114) & Legacy Park Drive 2025 Base No-Build Conditions (Existing Volume *Growth Factor)						2025 Projected Build Conditions Base Volume + Site Trips					
Time	Northbound	Southbound	Eastbound	Westbound	Growth Rate	Northbound	Southbound	Eastbound	Westbound	Time	Northbound	Southbound	Eastbound	Westbound			
6-7 AM	308	243	2	30	1.0178	313	247	2	30	6-7 AM	320	253	2	81			
7-8 AM	723	517	11	62		736	526	11	62	7-8 AM	749	537	11	155			
8-9 AM	598	438	11	47		609	446	11	47	8-9 AM	627	461	11	125			
9-10 AM	443	367	3	33		451	374	3	33	9-10 AM	468	388	3	89			
10-11 AM	481	317	2	27		490	323	2	27	10-11 AM	510	339	2	78			
11-12 PM	508	411	4	30		517	418	4	30	11-12 PM	543	440	4	80			
12-1 PM	478	399	6	35		487	406	6	35	12-1 PM	515	430	6	86			
1-2 PM	491	416	4	27		500	423	4	27	1-2 PM	527	446	4	78			
2-3 PM	606	499	6	48		617	508	6	48	2-3 PM	650	535	6	102			
3-4 PM	732	610	5	52		745	621	5	52	3-4 PM	786	655	5	105			
4-5 PM	784	602	2	42		798	613	2	42	4-5 PM	848	654	2	100			
5-6 PM	738	616	9	43		751	627	9	43	5-6 PM	803	670	9	107			



Appendix D

Signal Warrant Analysis

Traffic Signal Warrant Analysis Workbook

10/18/2022

2022 Existing Conditions

STUDY AND ANALYSIS INFORMATION

Municipality:	Mechanicsburg Borough
County:	Cumberland County
PennDOT Engineering District:	8

Analysis Date:	10/18/2022
Conducted By:	JW
Agency/Company Name:	TPD

Analysis Information

Data Collection Date:	9/27/2022
Day of the Week:	Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Market Street (SR 0114)
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach:	1	LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street:	35	MPH

Minor Street Information

Minor Street Name and Route Number:	Hemlock Drive/Legacy Park Drive
Minor Street Approach #1 Direction:	E-Bound
Minor Street Approach #2 Direction:	W-Bound

Number of Lanes for Moving Traffic on Each Minor Street Approach: 1 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No
Warrant 4, Pedestrian Volume	No	N/A
Warrant 5, School Crossing	No	N/A
Warrant 6, Coordinated Signal System	No	N/A
Warrant 7, Crash Experience	No	N/A
Warrant 8, Roadway Network	No	N/A
Warrant 9, Intersection Near a Grade Crossing	No	N/A
Warrant PA-1, ADT Volume Warrant	No	N/A
Warrant PA-2, Midblock and Trail Crossings	No	N/A

Traffic Signal Warrant Analysis Workbook
2022 Existing Conditions

10/18/2022

ENTER VOLUME DATA PER 15 MINUTE INTERVAL, PER APPROACH

Time Interval		Major Street Approach #1 (N-Bound)	Major Street Approach #2 (S-Bound)	Major Street Combined	Minor Street Approach #1 (E-Bound)	Minor Street Approach #2 (W-Bound)
Begin At	End Of	Volume	Volume	Total Volume	Volume	Volume
12:00 AM	12:14 AM			0		
12:15 AM	12:29 AM			0		
12:30 AM	12:44 AM			0		
12:45 AM	12:59 AM			0		
1:00 AM	1:14 AM			0		
1:15 AM	1:29 AM			0		
1:30 AM	1:44 AM			0		
1:45 AM	1:59 AM			0		
2:00 AM	2:14 AM			0		
2:15 AM	2:29 AM			0		
2:30 AM	2:44 AM			0		
2:45 AM	2:59 AM			0		
3:00 AM	3:14 AM			0		
3:15 AM	3:29 AM			0		
3:30 AM	3:44 AM			0		
3:45 AM	3:59 AM			0		
4:00 AM	4:14 AM			0		
4:15 AM	4:29 AM			0		
4:30 AM	4:44 AM			0		
4:45 AM	4:59 AM			0		
5:00 AM	5:14 AM			0		
5:15 AM	5:29 AM			0		
5:30 AM	5:44 AM			0		
5:45 AM	5:59 AM			0		
6:00 AM	6:14 AM	42	37	79	1	5
6:15 AM	6:29 AM	65	50	115	0	6
6:30 AM	6:44 AM	83	70	153	0	6
6:45 AM	6:59 AM	118	86	204	1	13
7:00 AM	7:14 AM	145	77	222	5	17
7:15 AM	7:29 AM	184	92	276	3	13
7:30 AM	7:44 AM	194	182	376	0	20
7:45 AM	7:59 AM	200	166	366	3	12
8:00 AM	8:14 AM	171	138	309	2	17
8:15 AM	8:29 AM	150	120	270	6	14
8:30 AM	8:44 AM	136	100	236	2	6
8:45 AM	8:59 AM	141	80	221	1	10
9:00 AM	9:14 AM	109	88	197	0	6
9:15 AM	9:29 AM	116	91	207	0	8
9:30 AM	9:44 AM	114	94	208	3	9
9:45 AM	9:59 AM	104	94	198	0	10
10:00 AM	10:14 AM	112	66	178	1	8
10:15 AM	10:29 AM	133	92	225	1	5
10:30 AM	10:44 AM	115	82	197	0	9
10:45 AM	10:59 AM	121	77	198	0	5
11:00 AM	11:14 AM	117	107	224	0	8
11:15 AM	11:29 AM	133	109	242	0	2
11:30 AM	11:44 AM	137	86	223	1	10
11:45 AM	11:59 AM	121	109	230	3	10

Traffic Signal Warrant Analysis Workbook

10/18/2022

2022 Existing Conditions

ENTER VOLUME DATA PER 15 MINUTE INTERVAL, PER APPROACH

Time Interval		Major Street Approach #1 (N-Bound)	Major Street Approach #2 (S-Bound)	Major Street Combined	Minor Street Approach #1 (E-Bound)	Minor Street Approach #2 (W-Bound)
Begin At	End Of	Volume	Volume	Total Volume	Volume	Volume
12:00 PM	12:14 PM	108	97	205	2	10
12:15 PM	12:29 PM	131	97	228	1	10
12:30 PM	12:44 PM	116	101	217	1	5
12:45 PM	12:59 PM	123	104	227	2	10
1:00 PM	1:14 PM	117	109	226	2	6
1:15 PM	1:29 PM	121	96	217	1	5
1:30 PM	1:44 PM	117	125	242	0	6
1:45 PM	1:59 PM	136	86	222	1	10
2:00 PM	2:14 PM	132	102	234	1	8
2:15 PM	2:29 PM	154	121	275	0	11
2:30 PM	2:44 PM	182	133	315	5	13
2:45 PM	2:59 PM	138	143	281	0	16
3:00 PM	3:14 PM	163	161	324	1	12
3:15 PM	3:29 PM	171	164	335	0	7
3:30 PM	3:44 PM	204	155	359	2	15
3:45 PM	3:59 PM	194	130	324	2	18
4:00 PM	4:14 PM	203	163	366	1	10
4:15 PM	4:29 PM	182	131	313	0	10
4:30 PM	4:44 PM	187	151	338	0	9
4:45 PM	4:59 PM	212	157	369	1	13
5:00 PM	5:14 PM	215	191	406	6	5
5:15 PM	5:29 PM	179	153	332	2	11
5:30 PM	5:44 PM	181	160	341	1	15
5:45 PM	5:59 PM	163	112	275	0	12
6:00 PM	6:14 PM			0		
6:15 PM	6:29 PM			0		
6:30 PM	6:44 PM			0		
6:45 PM	6:59 PM			0		
7:00 PM	7:14 PM			0		
7:15 PM	7:29 PM			0		
7:30 PM	7:44 PM			0		
7:45 PM	7:59 PM			0		
8:00 PM	8:14 PM			0		
8:15 PM	8:29 PM			0		
8:30 PM	8:44 PM			0		
8:45 PM	8:59 PM			0		
9:00 PM	9:14 PM			0		
9:15 PM	9:29 PM			0		
9:30 PM	9:44 PM			0		
9:45 PM	9:59 PM			0		
10:00 PM	10:14 PM			0		
10:15 PM	10:29 PM			0		
10:30 PM	10:44 PM			0		
10:45 PM	10:59 PM			0		
11:00 PM	11:14 PM			0		
11:15 PM	11:29 PM			0		
11:30 PM	11:44 PM			0		
11:45 PM	11:59 PM			0		

Approach Totals:

6890

5435

12325

65

476

2022 Existing Conditions

MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
---	----

Combination of Conditions A and B Necessary?*: No

*Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: **0**

Condition A Satisfied? **No**

Condition B Evaluation

Number of Unique Hours Met: **0**

Condition B Satisfied? **No**

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: **N/A**

Number of Unique Hours Met for Condition B: **N/A**

Combination of Condition A and Condition B Satisfied? **N/A**

2022 Existing Conditions

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach		Total Number of Unique Hours Met On Figure 4C-1
Major Street:	1 Lane	
Minor Street:	1 Lane	0

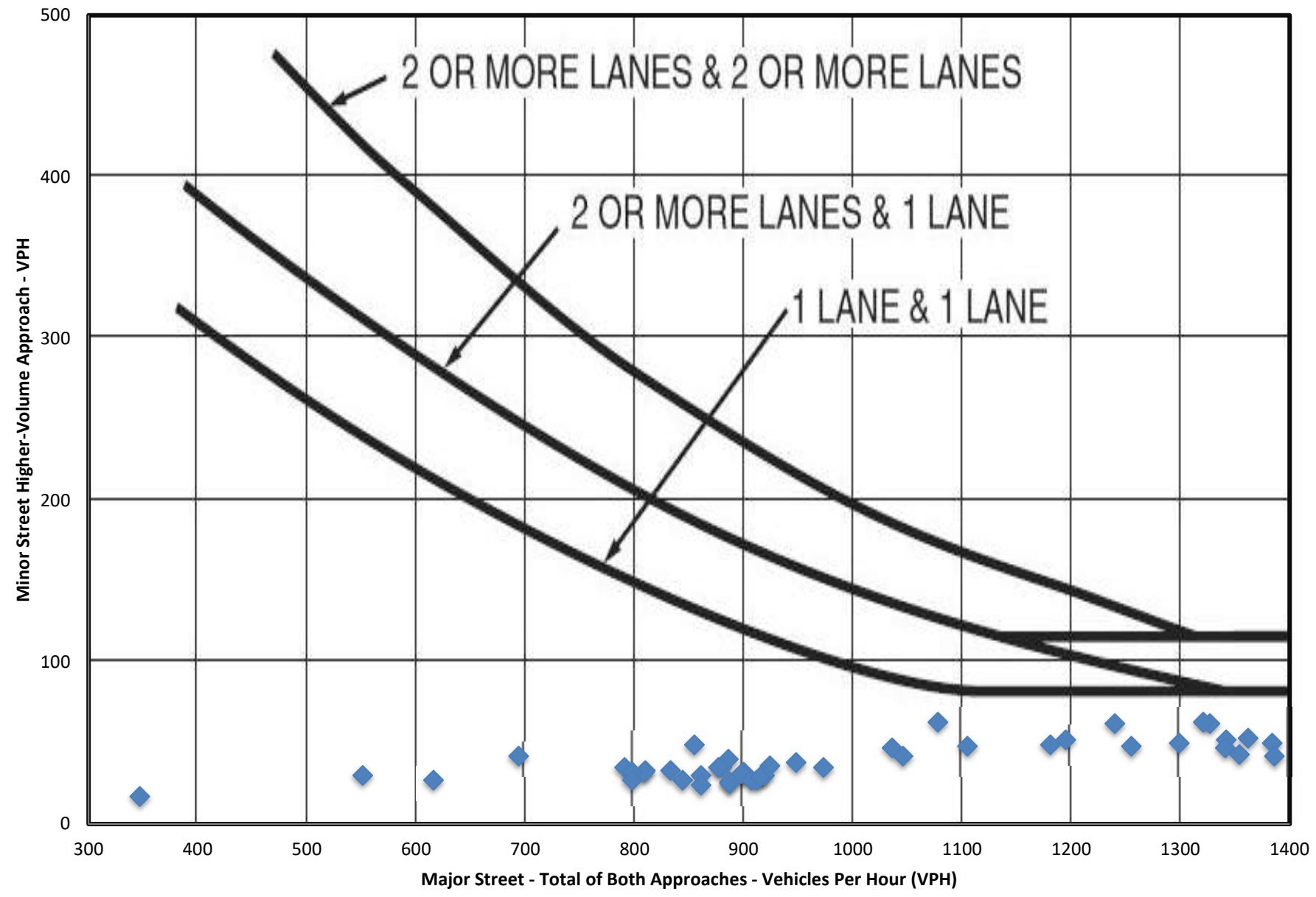
Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
---	----

Hourly Vehicular Volume			
Hour Interval	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
Beginning At			
12:00 AM	0	0	
12:15 AM	0	0	
12:30 AM	0	0	
12:45 AM	0	0	
1:00 AM	0	0	
1:15 AM	0	0	
1:30 AM	0	0	
1:45 AM	0	0	
2:00 AM	0	0	
2:15 AM	0	0	
2:30 AM	0	0	
2:45 AM	0	0	
3:00 AM	0	0	
3:15 AM	0	0	
3:30 AM	0	0	
3:45 AM	0	0	
4:00 AM	0	0	
4:15 AM	0	0	
4:30 AM	0	0	
4:45 AM	0	0	
5:00 AM	0	0	
5:15 AM	79	5	
5:30 AM	194	11	
5:45 AM	347	17	
6:00 AM	551	30	
6:15 AM	694	42	
6:30 AM	855	49	
6:45 AM	1078	63	
7:00 AM	1240	62	
7:15 AM	1327	62	
7:30 AM	1321	63	
7:45 AM	1181	49	
8:00 AM	1036	47	
8:15 AM	924	36	
8:30 AM	861	30	
8:45 AM	833	33	
9:00 AM	810	33	
9:15 AM	791	35	
9:30 AM	809	32	
9:45 AM	798	32	
10:00 AM	798	27	
10:15 AM	844	27	
10:30 AM	861	24	
10:45 AM	887	25	
11:00 AM	919	30	
11:15 AM	900	32	
11:30 AM	886	40	
11:45 AM	880	35	

2022 Existing Conditions

Hourly Vehicular Volume			
Hour Interval	Major Street Combined	Highest Minor Street Approach	Hour Met?
Beginning At	Vehicles Per Hour (VPH)	Vehicles Per Hour (VPH)	
12:00 PM	877	35	
12:15 PM	898	31	
12:30 PM	887	26	
12:45 PM	912	27	
1:00 PM	907	27	
1:15 PM	915	29	
1:30 PM	973	35	
1:45 PM	1046	42	
2:00 PM	1105	48	
2:15 PM	1195	52	
2:30 PM	1255	48	
2:45 PM	1299	50	
3:00 PM	1342	52	
3:15 PM	1384	50	
3:30 PM	1362	53	
3:45 PM	1341	47	
4:00 PM	1386	42	
4:15 PM	1426	37	
4:30 PM	1445	38	
4:45 PM	1448	44	
5:00 PM	1354	43	
5:15 PM	948	38	
5:30 PM	616	27	
5:45 PM	275	12	
6:00 PM	0	0	
6:15 PM	0	0	
6:30 PM	0	0	
6:45 PM	0	0	
7:00 PM	0	0	
7:15 PM	0	0	
7:30 PM	0	0	
7:45 PM	0	0	
8:00 PM	0	0	
8:15 PM	0	0	
8:30 PM	0	0	
8:45 PM	0	0	
9:00 PM	0	0	
9:15 PM	0	0	
9:30 PM	0	0	
9:45 PM	0	0	
10:00 PM	0	0	
10:15 PM	0	0	
10:30 PM	0	0	
10:45 PM	0	0	
11:00 PM	0	0	

2022 Existing Conditions

MUTCD Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume

2022 Existing Conditions

MUTCD WARRANT 3, PEAK HOUR

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
---	----

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time? Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	N/A
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	N/A

*If applicable, attach all supporting calculations and documentation.

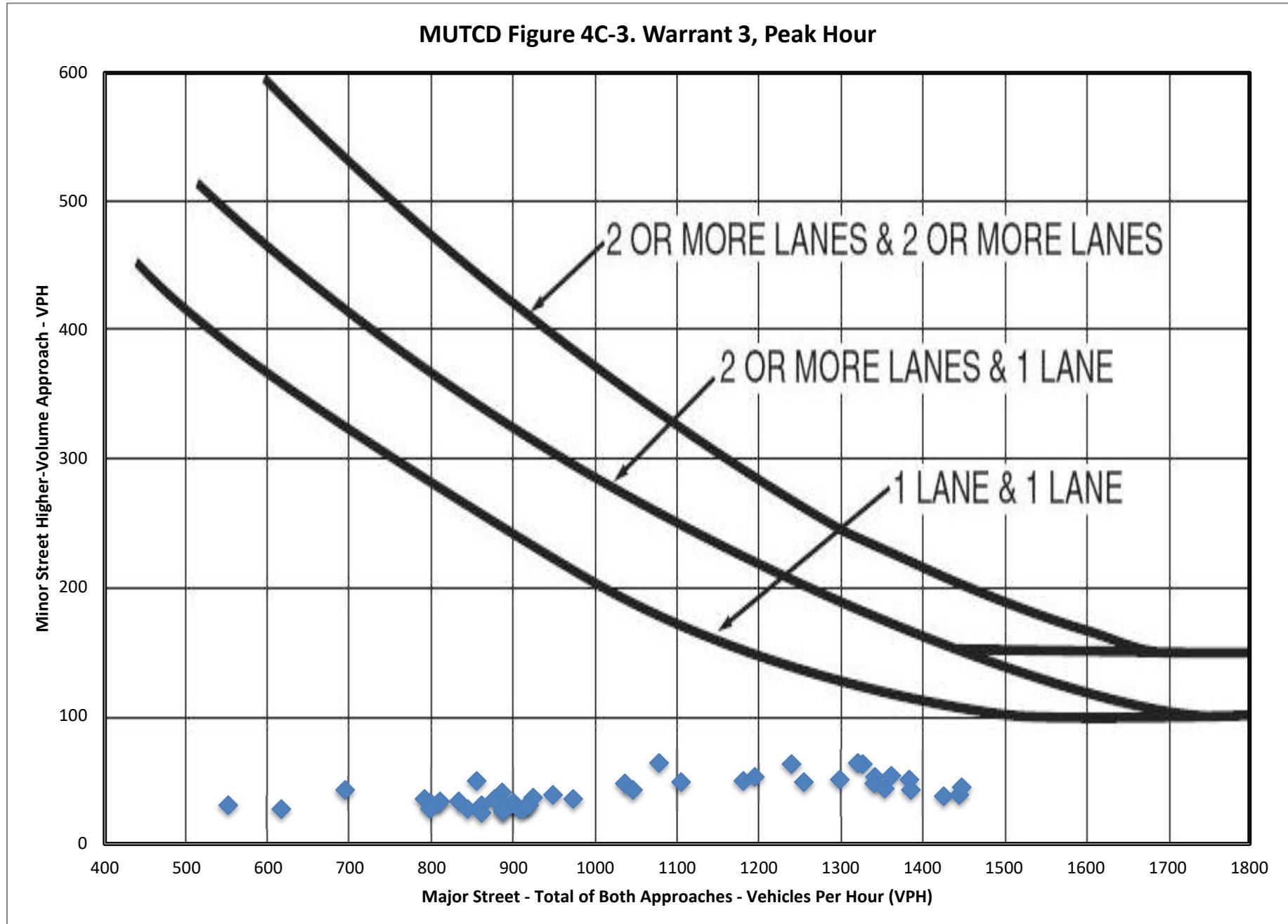
Total Number of Unique Hours Met On Figure 4C-3
0

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach	Hour Met?
		Vehicles Per Hour (VPH)	
12:00 AM	0	0	
12:15 AM	0	0	
12:30 AM	0	0	
12:45 AM	0	0	
1:00 AM	0	0	
1:15 AM	0	0	
1:30 AM	0	0	
1:45 AM	0	0	
2:00 AM	0	0	
2:15 AM	0	0	
2:30 AM	0	0	
2:45 AM	0	0	
3:00 AM	0	0	
3:15 AM	0	0	
3:30 AM	0	0	
3:45 AM	0	0	
4:00 AM	0	0	
4:15 AM	0	0	
4:30 AM	0	0	
4:45 AM	0	0	
5:00 AM	0	0	
5:15 AM	79	5	
5:30 AM	194	11	
5:45 AM	347	17	
6:00 AM	551	30	
6:15 AM	694	42	
6:30 AM	855	49	
6:45 AM	1078	63	
7:00 AM	1240	62	
7:15 AM	1327	62	
7:30 AM	1321	63	
7:45 AM	1181	49	
8:00 AM	1036	47	
8:15 AM	924	36	

2022 Existing Conditions

Hourly Vehicular Volume			
Hour Interval	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
Beginning At			
8:30 AM	861	30	
8:45 AM	833	33	
9:00 AM	810	33	
9:15 AM	791	35	
9:30 AM	809	32	
9:45 AM	798	32	
10:00 AM	798	27	
10:15 AM	844	27	
10:30 AM	861	24	
10:45 AM	887	25	
11:00 AM	919	30	
11:15 AM	900	32	
11:30 AM	886	40	
11:45 AM	880	35	
12:00 PM	877	35	
12:15 PM	898	31	
12:30 PM	887	26	
12:45 PM	912	27	
1:00 PM	907	27	
1:15 PM	915	29	
1:30 PM	973	35	
1:45 PM	1046	42	
2:00 PM	1105	48	
2:15 PM	1195	52	
2:30 PM	1255	48	
2:45 PM	1299	50	
3:00 PM	1342	52	
3:15 PM	1384	50	
3:30 PM	1362	53	
3:45 PM	1341	47	
4:00 PM	1386	42	
4:15 PM	1426	37	
4:30 PM	1445	38	
4:45 PM	1448	44	
5:00 PM	1354	43	
5:15 PM	948	38	
5:30 PM	616	27	
5:45 PM	275	12	
6:00 PM	0	0	
6:15 PM	0	0	
6:30 PM	0	0	
6:45 PM	0	0	
7:00 PM	0	0	
7:15 PM	0	0	
7:30 PM	0	0	
7:45 PM	0	0	
8:00 PM	0	0	
8:15 PM	0	0	
8:30 PM	0	0	
8:45 PM	0	0	
9:00 PM	0	0	
9:15 PM	0	0	
9:30 PM	0	0	
9:45 PM	0	0	
10:00 PM	0	0	
10:15 PM	0	0	
10:30 PM	0	0	
10:45 PM	0	0	
11:00 PM	0	0	

2022 Existing Conditions

MUTCD Figure 4C-3. Warrant 3, Peak Hour

Traffic Signal Warrant Analysis Workbook
2025 Projected (Build) Condition

11/9/2022

STUDY AND ANALYSIS INFORMATION

Municipality:	Mechanicsburg Borough	Analysis Date:	10/18/2022
County:	Cumberland County	Conducted By:	JW
PennDOT Engineering District:	8	Agency/Company Name:	TPD

Analysis Information

Data Collection Date:	9/27/2022
Day of the Week:	Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Market Street (SR 0114)
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street: MPH

Minor Street Information

Minor Street Name and Route Number:	Hemlock Drive/Legacy Park Drive
Minor Street Approach #1 Direction:	E-Bound
Minor Street Approach #2 Direction:	W-Bound

Number of Lanes for Moving Traffic on Each Minor Street Approach: LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Warrant 2, Four-Hour Vehicular Volume	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Warrant 3, Peak Hour	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Warrant 4, Pedestrian Volume	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant 5, School Crossing	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant 6, Coordinated Signal System	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant 7, Crash Experience	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant 8, Roadway Network	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant 9, Intersection Near a Grade Crossing	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant PA-1, ADT Volume Warrant	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Warrant PA-2, Midblock and Trail Crossings	<input type="checkbox"/> No	<input type="checkbox"/> N/A

Traffic Signal Warrant Analysis Workbook

11/9/2022

2025 Projected (Build) Condition

ENTER VOLUME DATA PER 15 MINUTE INTERVAL, PER APPROACH

Time Interval		Major Street Approach #1 (N-Bound)	Major Street Approach #2 (S-Bound)	Major Street Combined	Minor Street Approach #1 (E-Bound)	Minor Street Approach #2 (W-Bound)
Begin At	End Of	Volume	Volume	Total Volume	Volume	Volume
12:00 AM	12:14 AM			0		
12:15 AM	12:29 AM			0		
12:30 AM	12:44 AM			0		
12:45 AM	12:59 AM			0		
1:00 AM	1:14 AM			0		
1:15 AM	1:29 AM			0		
1:30 AM	1:44 AM			0		
1:45 AM	1:59 AM			0		
2:00 AM	2:14 AM			0		
2:15 AM	2:29 AM			0		
2:30 AM	2:44 AM			0		
2:45 AM	2:59 AM			0		
3:00 AM	3:14 AM			0		
3:15 AM	3:29 AM			0		
3:30 AM	3:44 AM			0		
3:45 AM	3:59 AM			0		
4:00 AM	4:14 AM			0		
4:15 AM	4:29 AM			0		
4:30 AM	4:44 AM			0		
4:45 AM	4:59 AM			0		
5:00 AM	5:14 AM			0		
5:15 AM	5:29 AM			0		
5:30 AM	5:44 AM			0		
5:45 AM	5:59 AM			0		
6:00 AM	6:14 AM	320	253	573	2	81
6:15 AM	6:29 AM	0	0	0	0	0
6:30 AM	6:44 AM	0	0	0	0	0
6:45 AM	6:59 AM	0	0	0	0	0
7:00 AM	7:14 AM	749	537	1286	11	155
7:15 AM	7:29 AM	0	0	0	0	0
7:30 AM	7:44 AM	0	0	0	0	0
7:45 AM	7:59 AM	0	0	0	0	0
8:00 AM	8:14 AM	627	461	1088	11	125
8:15 AM	8:29 AM	0	0	0	0	0
8:30 AM	8:44 AM	0	0	0	0	0
8:45 AM	8:59 AM	0	0	0	0	0
9:00 AM	9:14 AM	468	388	856	3	89
9:15 AM	9:29 AM	0	0	0	0	0
9:30 AM	9:44 AM	0	0	0	0	0
9:45 AM	9:59 AM	0	0	0	0	0
10:00 AM	10:14 AM	510	339	849	2	78
10:15 AM	10:29 AM	0	0	0	0	0
10:30 AM	10:44 AM	0	0	0	0	0
10:45 AM	10:59 AM	0	0	0	0	0
11:00 AM	11:14 AM	543	440	983	4	80
11:15 AM	11:29 AM	0	0	0	0	0
11:30 AM	11:44 AM	0	0	0	0	0
11:45 AM	11:59 AM	0	0	0	0	0

Traffic Signal Warrant Analysis Workbook

11/9/2022

2025 Projected (Build) Condition

ENTER VOLUME DATA PER 15 MINUTE INTERVAL, PER APPROACH

Time Interval		Major Street Approach #1 (N-Bound)	Major Street Approach #2 (S-Bound)	Major Street Combined	Minor Street Approach #1 (E-Bound)	Minor Street Approach #2 (W-Bound)
Begin At	End Of	Volume	Volume	Total Volume	Volume	Volume
12:00 PM	12:14 PM	515	430	945	6	86
12:15 PM	12:29 PM	0	0	0	0	0
12:30 PM	12:44 PM	0	0	0	0	0
12:45 PM	12:59 PM	0	0	0	0	0
1:00 PM	1:14 PM	527	446	973	4	78
1:15 PM	1:29 PM	0	0	0	0	0
1:30 PM	1:44 PM	0	0	0	0	0
1:45 PM	1:59 PM	0	0	0	0	0
2:00 PM	2:14 PM	650	535	1185	6	102
2:15 PM	2:29 PM	0	0	0	0	0
2:30 PM	2:44 PM	0	0	0	0	0
2:45 PM	2:59 PM	0	0	0	0	0
3:00 PM	3:14 PM	786	655	1441	5	105
3:15 PM	3:29 PM	0	0	0	0	0
3:30 PM	3:44 PM	0	0	0	0	0
3:45 PM	3:59 PM	0	0	0	0	0
4:00 PM	4:14 PM	848	654	1502	2	100
4:15 PM	4:29 PM	0	0	0	0	0
4:30 PM	4:44 PM	0	0	0	0	0
4:45 PM	4:59 PM	0	0	0	0	0
5:00 PM	5:14 PM	803	670	1473	9	107
5:15 PM	5:29 PM	0	0	0	0	0
5:30 PM	5:44 PM	0	0	0	0	0
5:45 PM	5:59 PM	0	0	0	0	0
6:00 PM	6:14 PM			0		
6:15 PM	6:29 PM			0		
6:30 PM	6:44 PM			0		
6:45 PM	6:59 PM			0		
7:00 PM	7:14 PM			0		
7:15 PM	7:29 PM			0		
7:30 PM	7:44 PM			0		
7:45 PM	7:59 PM			0		
8:00 PM	8:14 PM			0		
8:15 PM	8:29 PM			0		
8:30 PM	8:44 PM			0		
8:45 PM	8:59 PM			0		
9:00 PM	9:14 PM			0		
9:15 PM	9:29 PM			0		
9:30 PM	9:44 PM			0		
9:45 PM	9:59 PM			0		
10:00 PM	10:14 PM			0		
10:15 PM	10:29 PM			0		
10:30 PM	10:44 PM			0		
10:45 PM	10:59 PM			0		
11:00 PM	11:14 PM			0		
11:15 PM	11:29 PM			0		
11:30 PM	11:44 PM			0		
11:45 PM	11:59 PM			0		

Approach Totals:

7346

5808

13154

65

1186

2025 Projected (Build) Condition

MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
---	----

Combination of Conditions A and B Necessary?*: No

*Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 1

Condition A Satisfied? No

Condition B Evaluation

Number of Unique Hours Met: 11

Condition B Satisfied? Yes

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

Combination of Condition A and Condition B Satisfied? N/A

2025 Projected (Build) Condition

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

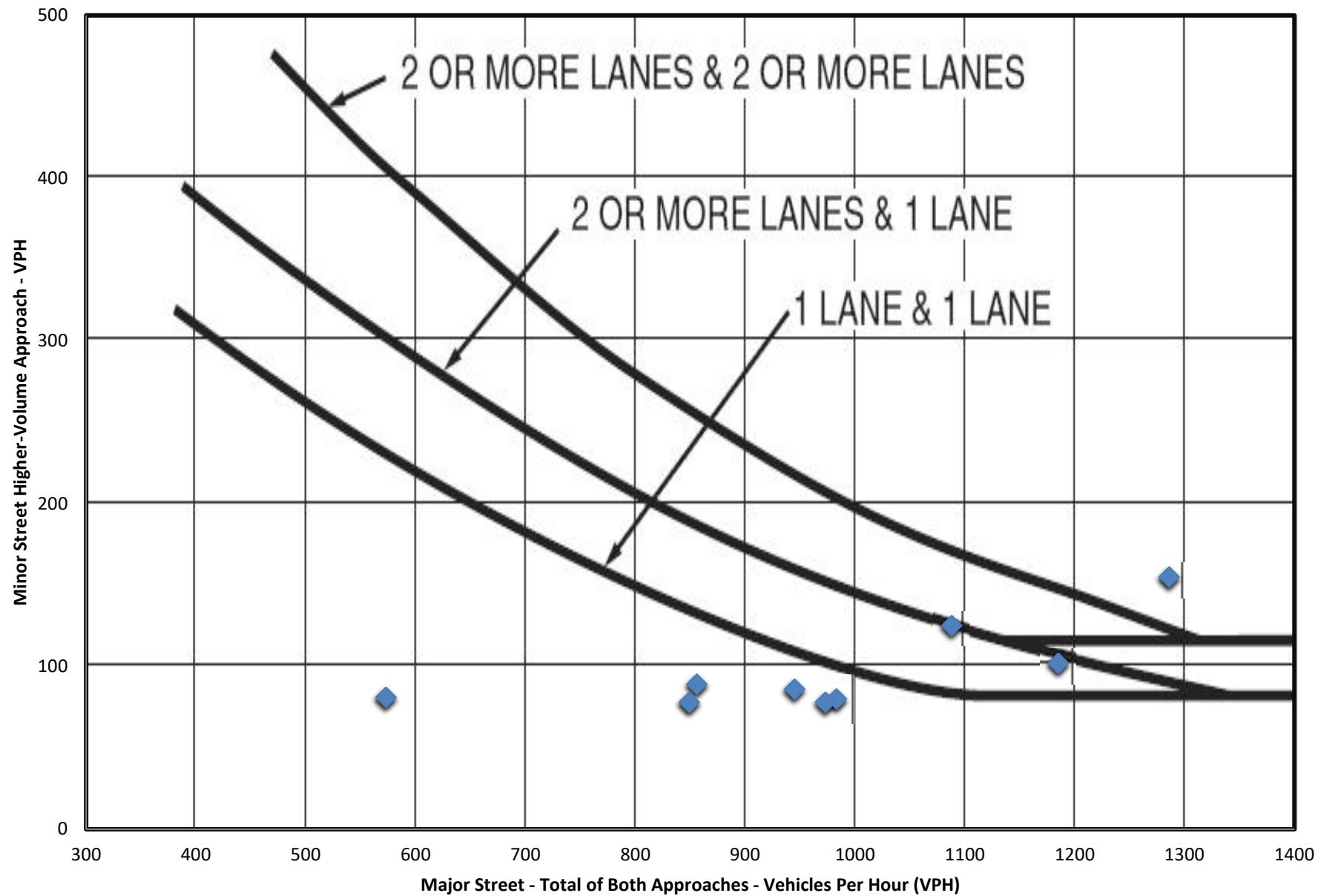
Number of Lanes for Moving Traffic on Each Approach		Total Number of Unique Hours Met On Figure 4C-1
Major Street:	1 Lane	
Minor Street:	1 Lane	6

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
---	----

Hourly Vehicular Volume			
Hour Interval	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
Beginning At			
12:00 AM	0	0	
12:15 AM	0	0	
12:30 AM	0	0	
12:45 AM	0	0	
1:00 AM	0	0	
1:15 AM	0	0	
1:30 AM	0	0	
1:45 AM	0	0	
2:00 AM	0	0	
2:15 AM	0	0	
2:30 AM	0	0	
2:45 AM	0	0	
3:00 AM	0	0	
3:15 AM	0	0	
3:30 AM	0	0	
3:45 AM	0	0	
4:00 AM	0	0	
4:15 AM	0	0	
4:30 AM	0	0	
4:45 AM	0	0	
5:00 AM	0	0	
5:15 AM	573	81	
5:30 AM	573	81	
5:45 AM	573	81	
6:00 AM	573	81	
6:15 AM	1286	155	Met
6:30 AM	1286	155	Met
6:45 AM	1286	155	Met
7:00 AM	1286	155	Met
7:15 AM	1088	125	Met
7:30 AM	1088	125	Met
7:45 AM	1088	125	Met
8:00 AM	1088	125	Met
8:15 AM	856	89	
8:30 AM	856	89	
8:45 AM	856	89	
9:00 AM	856	89	
9:15 AM	849	78	
9:30 AM	849	78	
9:45 AM	849	78	
10:00 AM	849	78	
10:15 AM	983	80	
10:30 AM	983	80	
10:45 AM	983	80	
11:00 AM	983	80	
11:15 AM	945	86	
11:30 AM	945	86	
11:45 AM	945	86	

2025 Projected (Build) Condition

Hourly Vehicular Volume			
Hour Interval	Major Street Combined	Highest Minor Street Approach	Hour Met?
Beginning At	Vehicles Per Hour (VPH)	Vehicles Per Hour (VPH)	
12:00 PM	945	86	
12:15 PM	973	78	
12:30 PM	973	78	
12:45 PM	973	78	
1:00 PM	973	78	
1:15 PM	1185	102	Met
1:30 PM	1185	102	Met
1:45 PM	1185	102	Met
2:00 PM	1185	102	Met
2:15 PM	1441	105	Met
2:30 PM	1441	105	Met
2:45 PM	1441	105	Met
3:00 PM	1441	105	Met
3:15 PM	1502	100	Met
3:30 PM	1502	100	Met
3:45 PM	1502	100	Met
4:00 PM	1502	100	Met
4:15 PM	1473	107	Met
4:30 PM	1473	107	Met
4:45 PM	1473	107	Met
5:00 PM	1473	107	Met
5:15 PM	0	0	
5:30 PM	0	0	
5:45 PM	0	0	
6:00 PM	0	0	
6:15 PM	0	0	
6:30 PM	0	0	
6:45 PM	0	0	
7:00 PM	0	0	
7:15 PM	0	0	
7:30 PM	0	0	
7:45 PM	0	0	
8:00 PM	0	0	
8:15 PM	0	0	
8:30 PM	0	0	
8:45 PM	0	0	
9:00 PM	0	0	
9:15 PM	0	0	
9:30 PM	0	0	
9:45 PM	0	0	
10:00 PM	0	0	
10:15 PM	0	0	
10:30 PM	0	0	
10:45 PM	0	0	
11:00 PM	0	0	

MUTCD Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume

2025 Projected (Build) Condition

MUTCD WARRANT 3, PEAK HOUR

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
---	----

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time? Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	N/A
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	N/A

*If applicable, attach all supporting calculations and documentation.

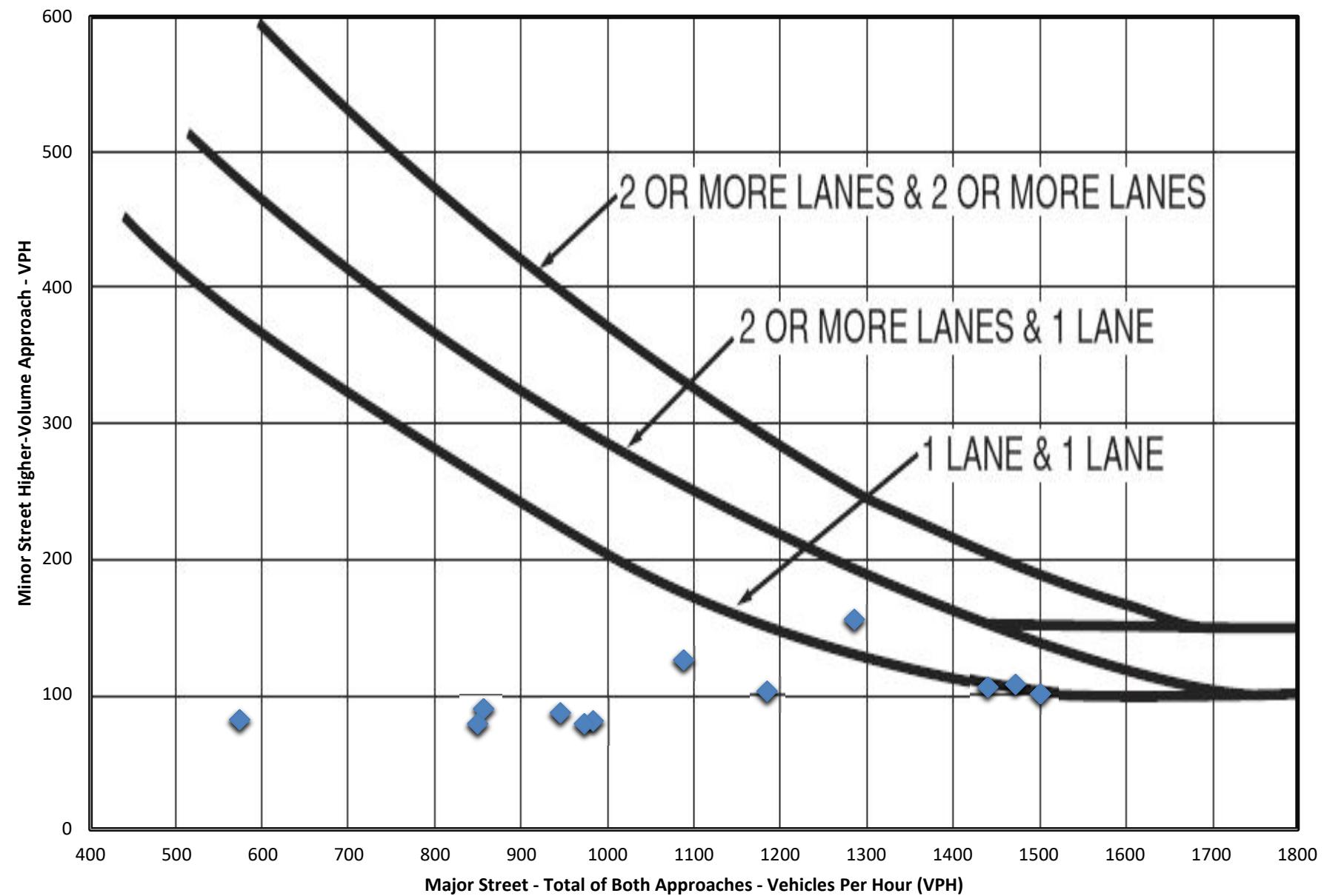
Total Number of Unique Hours Met On Figure 4C-3
4

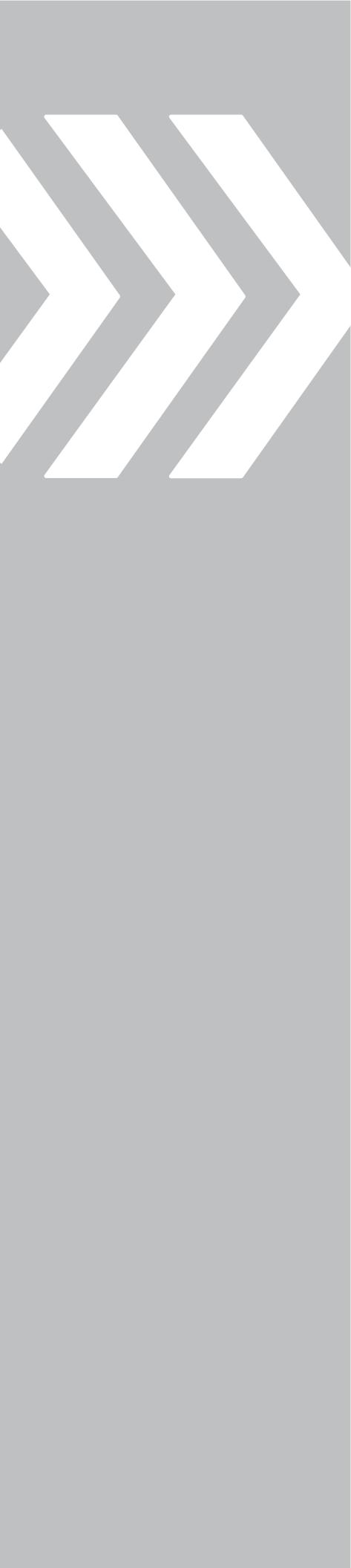
Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined	Highest Minor Street Approach	Hour Met?
	Vehicles Per Hour (VPH)	Vehicles Per Hour (VPH)	
12:00 AM	0	0	
12:15 AM	0	0	
12:30 AM	0	0	
12:45 AM	0	0	
1:00 AM	0	0	
1:15 AM	0	0	
1:30 AM	0	0	
1:45 AM	0	0	
2:00 AM	0	0	
2:15 AM	0	0	
2:30 AM	0	0	
2:45 AM	0	0	
3:00 AM	0	0	
3:15 AM	0	0	
3:30 AM	0	0	
3:45 AM	0	0	
4:00 AM	0	0	
4:15 AM	0	0	
4:30 AM	0	0	
4:45 AM	0	0	
5:00 AM	0	0	
5:15 AM	573	81	
5:30 AM	573	81	
5:45 AM	573	81	
6:00 AM	573	81	
6:15 AM	1286	155	Met
6:30 AM	1286	155	Met
6:45 AM	1286	155	Met
7:00 AM	1286	155	Met
7:15 AM	1088	125	
7:30 AM	1088	125	
7:45 AM	1088	125	
8:00 AM	1088	125	
8:15 AM	856	89	

2025 Projected (Build) Condition

Hourly Vehicular Volume			
Hour Interval	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
Beginning At			
8:30 AM	856	89	
8:45 AM	856	89	
9:00 AM	856	89	
9:15 AM	849	78	
9:30 AM	849	78	
9:45 AM	849	78	
10:00 AM	849	78	
10:15 AM	983	80	
10:30 AM	983	80	
10:45 AM	983	80	
11:00 AM	983	80	
11:15 AM	945	86	
11:30 AM	945	86	
11:45 AM	945	86	
12:00 PM	945	86	
12:15 PM	973	78	
12:30 PM	973	78	
12:45 PM	973	78	
1:00 PM	973	78	
1:15 PM	1185	102	
1:30 PM	1185	102	
1:45 PM	1185	102	
2:00 PM	1185	102	
2:15 PM	1441	105	Met
2:30 PM	1441	105	Met
2:45 PM	1441	105	Met
3:00 PM	1441	105	Met
3:15 PM	1502	100	Met
3:30 PM	1502	100	Met
3:45 PM	1502	100	Met
4:00 PM	1502	100	Met
4:15 PM	1473	107	Met
4:30 PM	1473	107	Met
4:45 PM	1473	107	Met
5:00 PM	1473	107	Met
5:15 PM	0	0	
5:30 PM	0	0	
5:45 PM	0	0	
6:00 PM	0	0	
6:15 PM	0	0	
6:30 PM	0	0	
6:45 PM	0	0	
7:00 PM	0	0	
7:15 PM	0	0	
7:30 PM	0	0	
7:45 PM	0	0	
8:00 PM	0	0	
8:15 PM	0	0	
8:30 PM	0	0	
8:45 PM	0	0	
9:00 PM	0	0	
9:15 PM	0	0	
9:30 PM	0	0	
9:45 PM	0	0	
10:00 PM	0	0	
10:15 PM	0	0	
10:30 PM	0	0	
10:45 PM	0	0	
11:00 PM	0	0	

MUTCD Figure 4C-3. Warrant 3, Peak Hour





Appendix E

Excerpts from Legacy Park TIS

TRAFFIC PLANNING

Est. 1989

AND DESIGN, INC.



Legacy Park (Formerly Hess Farm)

Transportation Impact Study

Mechanicsburg Borough, Cumberland County

For Submission To:

PennDOT District 8-0 &

Mechanicsburg Borough

Last Revised: February 11, 2014

TPD# LMBU.A.00003



**LEGACY PARK
(FORMERLY HESS FARM)
TRANSPORTATION IMPACT STUDY**

For Submission to:

**Mechanicsburg Borough, Cumberland County, PA
& PennDOT District 8-0**

Prepared For:

**Landmark Homes
Lee Bothell
1737 W. Main Street
Ephrata, Pennsylvania 17522**

**Phone: (717) 733-1536
Fax: (717) 738-4183**

**May 16, 2014
Revised August 26, 2014
Revised October 15, 2014
Revised December 29, 2014
Revised February 11, 2015
TPD # LMBU.A.00003**

Prepared By:

**Traffic Planning and Design, Inc.
1426 North Third Street, Suite 250
Harrisburg, Pennsylvania 17102**

**Phone: (717) 234-1430
Fax: (717) 234-4490
E-mail: TPD@TrafficPD.com
Web Site: www.trafficpd.com**



2/11/15

**Craig Mellott, P.E., PTOE
Principal, Central PA Regional Leader
Pennsylvania License Number PE071485**

EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed Legacy Park development on the roadway network in Mechanicsburg Borough, Cumberland County, PA. Based on this evaluation, the following conclusions were reached:

1. A formal Transportation Impact Study (TIS) for this site was previously prepared by TPD in 2006/2007 for a proposed development (Hess Farm) very similar in scope to the proposed Legacy Farm project. This previous TIS was reviewed extensively by both PennDOT and Mechanicsburg Borough. Since the former project did not move forward, TPD has updated the TIS for the Legacy Park project in order to incorporate current traffic volumes and to account for PennDOT's current TIS standards.
2. The project scope and the extent of the study area were confirmed with representatives of PennDOT and Township staff at a meeting on January 7, 2014. The study area intersections included in this TIS are as follows:
 - Market Street (SR 0114) and Main Street (SR 0641);
 - Market Street and Simpson Street (SR 2014);
 - Market Street and Marble Street (SR 2011/Boro);
 - Market Street and Shepherdstown Road (SR 2023);
 - Market Street and Hemlock Drive;
 - Market Street and Cumberland Parkway/Market Plaza Way;
 - Shepherdstown Road and Simpson Street;
 - Shepherdstown Road and Marble Street (Boro);
 - Walnut Street (SR 1011) and Main Street;
 - Walnut Street and Simpson Street;
 - Filbert Street and Simpson Street;
 - Norway Street and Marble Street (Boro);
 - Allendale Road and Simpson Street;
 - Allendale Road and Apple Drive;
 - Allendale Road and Charles Street;
 - Allendale Road and Alison Avenue.
2. The project site is located on the eastern side of S. Market Street (SR 0114), just south of the S. Market Street (SR 0114)/Shepherdstown Road (SR 2023) intersection. The proposed development is expected to consist of the following uses at full build-out:
 - Single Family-Detached Homes (209 dwelling units);
 - Age-Qualified Single Family-Detached Homes (97 dwelling units);
 - Apartments (216 dwelling units);
 - Residential Townhomes/Condominiums (171 dwelling units);
 - Strip Retail/Commercial (36,744 s.f.).

-
3. Access to the site is proposed via one new full-movement local road to Market Street (SR 0114), located opposite Hemlock Drive, and a second full-movement local road to Allendale Road (T-608), south of Jenna Court. In addition, the development will be linked to the adjacent (existing) community roadway network via the extension of Norway Street and Despania Drive southward into the site.
 4. Under the 2025 and 2030 projected conditions, with implementation of the site-related recommendations, all approaches and turning movements at the site driveway intersections with the external roadway network will operate at LOS C or better during the weekday A.M., weekday P.M., and Saturday midday peak hours.
 5. All proposed driveway location sight distances will exceed PennDOT's Desirable and Safe Stopping Sight Distance (SSSD) criteria.
 6. Upon full build-out, the proposed Legacy Park development is expected to generate 416 new vehicle-trips during the weekday A.M. peak hour, 543 new vehicle-trips during the weekday P.M. peak hour, and 516 new vehicle-trips during the Saturday midday peak hour.
 7. Traffic Planning and Design Inc. (TPD) recommends the following roadway improvements as outlined at the study area intersections:

Elmwood Avenue and Despania Drive (Proposed Site Access)

- Erect a "Stop" sign on the existing Despania Drive approach to control exiting traffic.

Allendale Road and Proposed Site Access Road

- Erect a "Stop" sign on the Site Access Road approach to control exiting traffic;
- It is proposed to realign Allendale Road along the site frontage to provide a smooth horizontal curve at the northeastern tip of the site, which will eliminate the sharp reverse curves that presently exist in this area. The Allendale Road realignment should be designed in a manner that provides adequate sight distances at the site access road intersection.

Market Street (SR 0114) and Hemlock Drive/Proposed Site Access Road

- Design the site access in accordance with PennDOT's local road standards and obtain a Highway Occupancy Permit (HOP).
- Construct a 150' dedicated left turn lane with a 75' taper on the southbound Market Street approach.
- Construct a 150' dedicated right turn lane with a 100' taper on the northbound Market Street approach.
- Construct a 75' dedicated left turn lane with a 75' taper on the northbound Market Street approach.
- Construct an additional thru lane with a 150' lane opening taper on the northbound Market Street approach to the intersection.
- Monitor signal warrants as development progresses on the site; at the time applicable signal warrants are met, install a fully-actuated traffic signal with permitted/protected advance left turn phasing on the southbound Market Street approach.

- Design the proposed site access road to accommodate one ingress lane and two egress lanes near its intersection with Market Street. Under the initial unsignalized control, the driveway egress should be striped as a single lane and a “Stop” sign should be erected on the egress driveway approach. Upon signalization of the intersection, the driveway egress should be striped to provide a 100’ dedicated right turn lane and a shared through/left lane.
- If the driveway is initially constructed with unsignalized control, install underground conduit in conjunction with construction of the proposed local road and auxiliary turn lanes.

Market Street (SR 0114) and Shepherdstown Road (SR 2023)

- Install a fully-actuated, two-phase traffic signal.
- Coordinate this new signal with the proposed signal at the Market Street/Hemlock Drive/Proposed Site Driveway intersection.
- Widen northbound Market Street to provide a right turn lane. The inner northbound thru lane from the Market Street/Hemlock Drive/Site Driveway intersection should drop into this right turn lane.

Market Street (SR 0114) and Cumberland Parkway/Market Plaza Way

- Extend the existing southbound left turn lane on Market Street to provide 285’ of additional storage (485’ total storage bay with lengthening).

Market Street (SR 0114) and Marble Street (SR 2011/Boro)

- The Developer will provide a fair-share contribution towards potential future improvements at this intersection.

Main Street (SR 0641) and Walnut Street (SR 1011)

- The Developer will provide a fair-share contribution towards potential future improvements at this intersection.

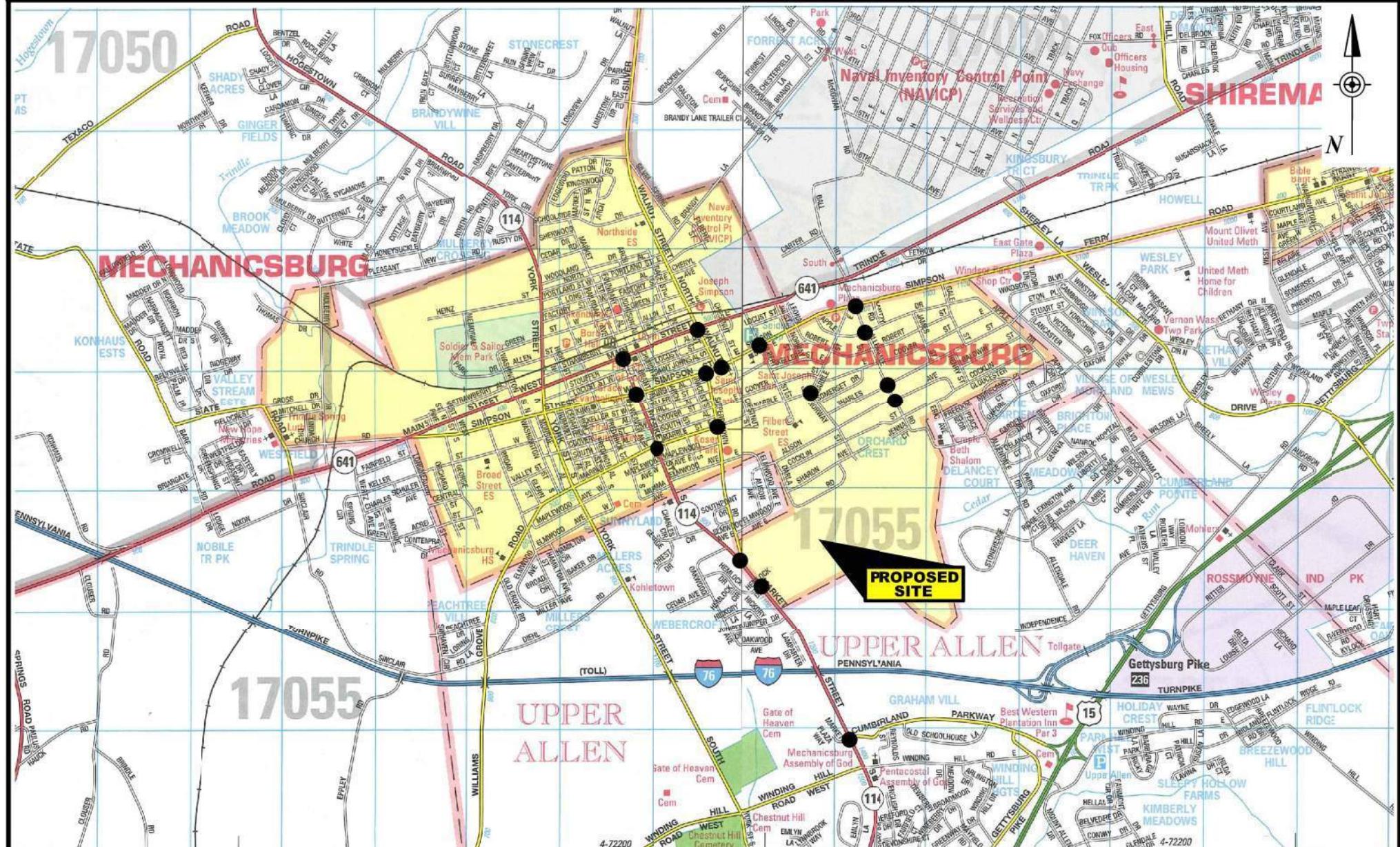
Simpson Street (SR 2014) and Walnut Street (SR 1011)

- The Developer will provide a fair-share contribution towards potential future improvements at this intersection.

As part of PennDOT’s HOP process, the applicant will coordinate and fund the implementation of the recommended roadway improvements. All improvements will be designed and constructed in full compliance with ADA requirements unless otherwise directed or approved by the Department.

In accordance with §22-513.B(5) of the Mechanicsburg Borough Subdivision and Land Development Ordinance, the applicant shall, as a condition of approval of the final plat, agree to construct the traffic improvements noted above at the applicant’s cost or in lieu thereof, and with the written consent of the Borough, reimburse the Borough for the cost of the improvements.

Preliminary construction costs have not been determined at this time, conceptual plans for the



KEY:

● = STUDY AREA INTERSECTION

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FIGURE 1

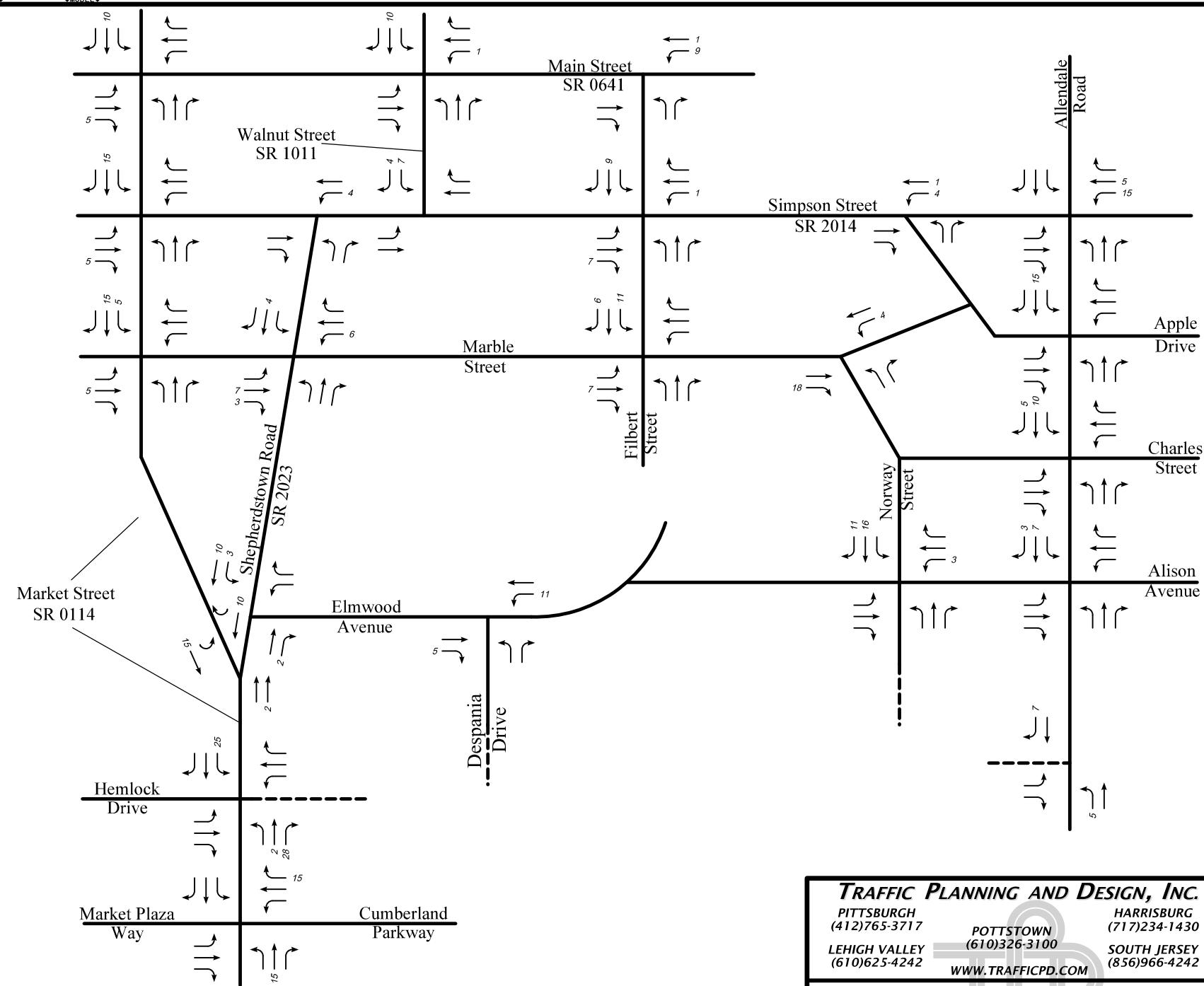
LOCATION AND
STUDY AREA MAP



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FIGURE 2

SITE PLAN

**KEY:**

----- PROPOSED DRIVEWAY

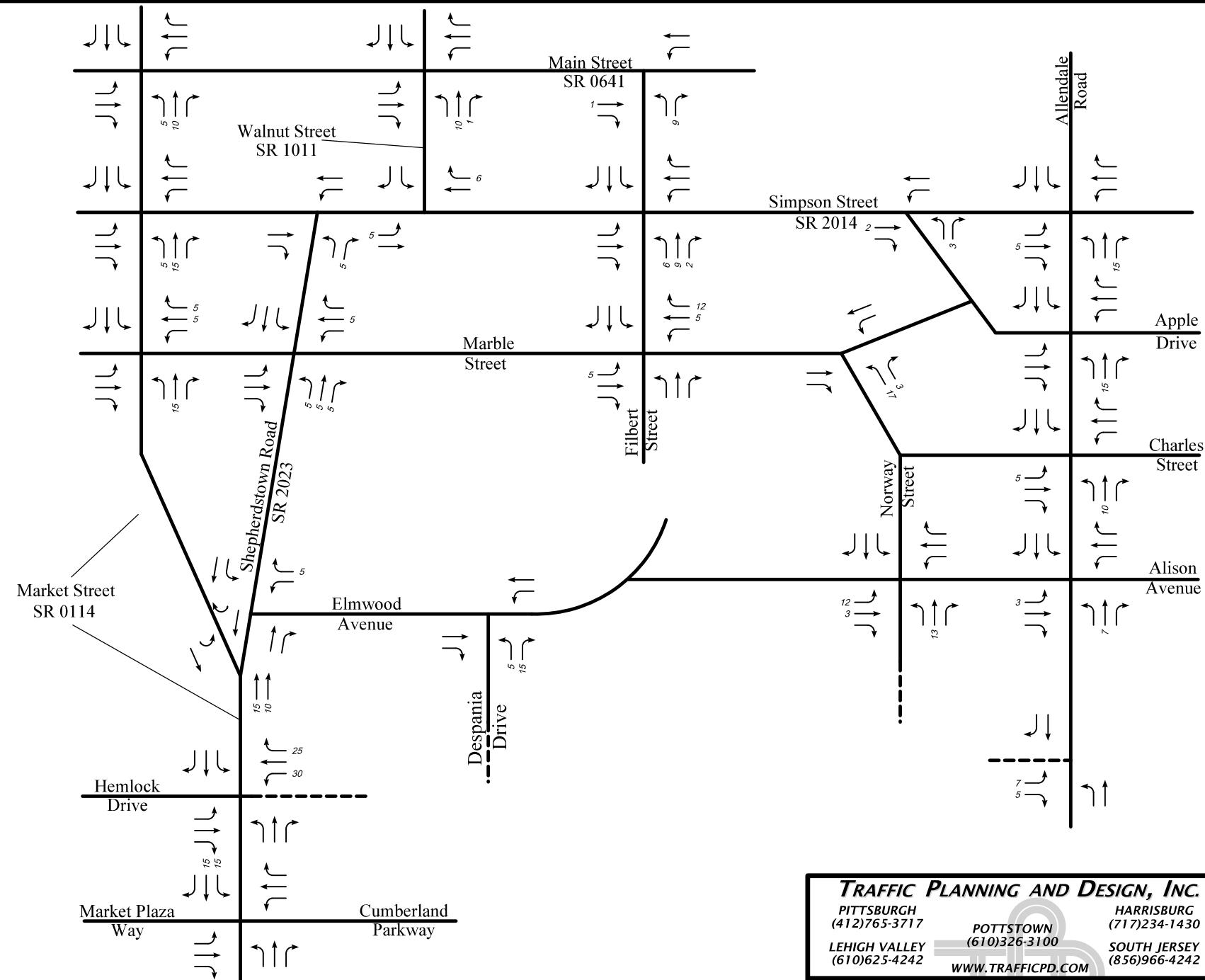
SCHEMATIC DRAWING: NOT TO SCALE

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FIGURE E-1
HESS FARM TND
NEW TRIP DISTRIBUTION AND ASSIGNMENT
ENTERING PERCENTAGES

**KEY:**

----- PROPOSED DRIVEWAY

SCHEMATIC DRAWING: NOT TO SCALE

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FIGURE E-2
HESS FARM TND
 NEW TRIP DISTRIBUTION AND ASSIGNMENT
 EXITING PERCENTAGES



Appendix F

Phasing/Circulation Plans

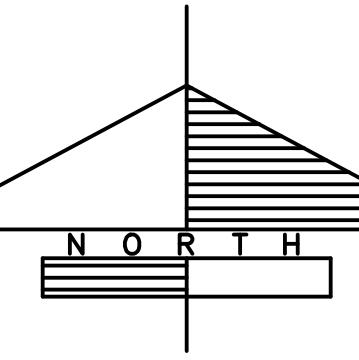
LEGEND

PROPOSED PHASING LINE

TENTATIVE CONSTRUCTION SCHEDULE

PHASE	ESTIMATED COMPLETION
PHASE 1	BEGINNING SPRING OF 2016
PHASE 2	BEGINNING SPRING OF 2018
PHASE 3	BEGINNING SPRING OF 2020
PHASE 4	BEGINNING FALL OF 2022
PHASE 5	BEGINNING SPRING OF 2023 (SCHEDULE SUBJECT TO CHANGE)

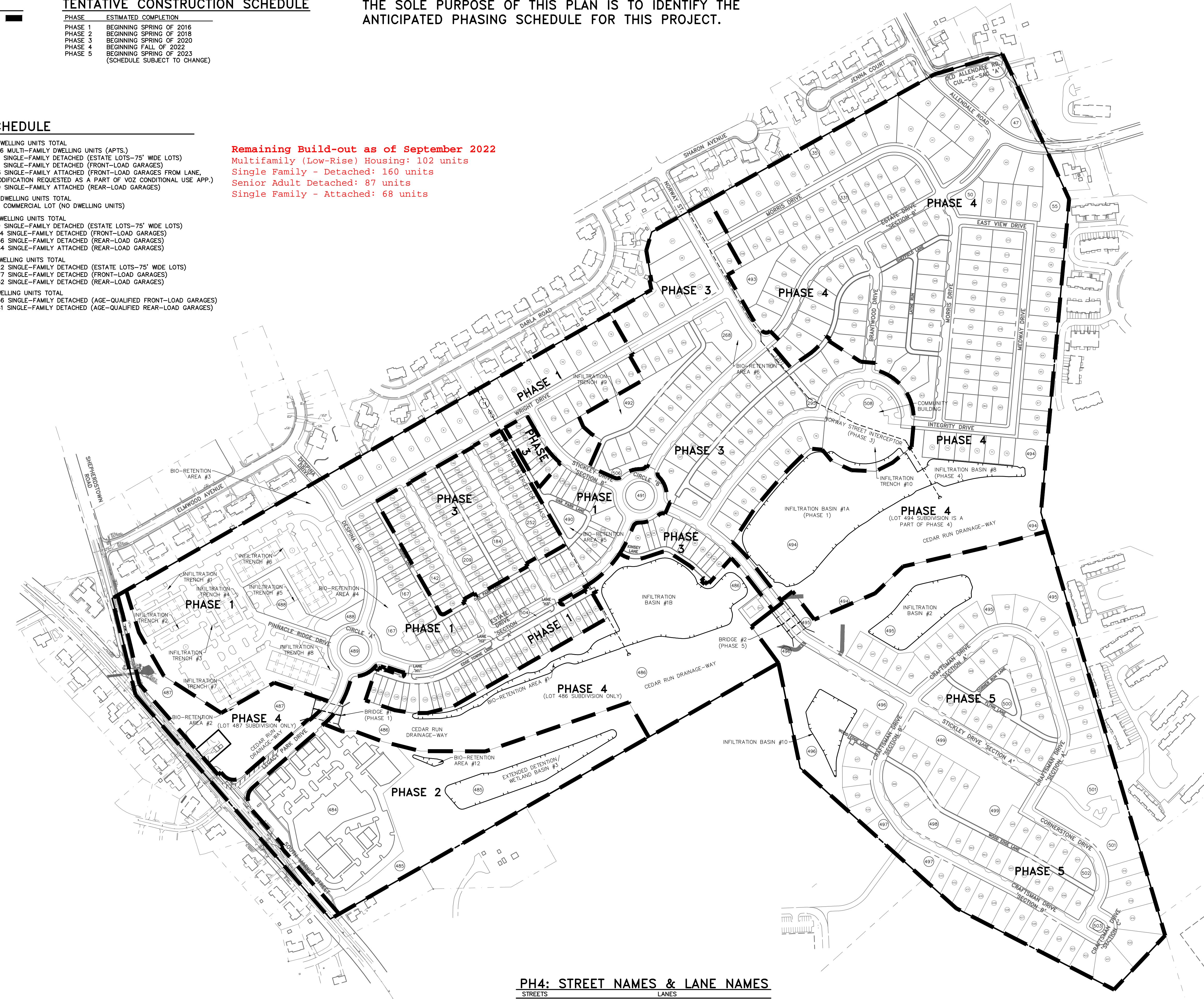
THE SOLE PURPOSE OF THIS PLAN IS TO IDENTIFY THE
ANTICIPATED PHASING SCHEDULE FOR THIS PROJECT.



DWELLING SCHEDULE

PHASE 1	-----	325 DWELLING UNITS TOTAL • 216 MULTI-FAMILY DWELLING UNITS (APTS.) • 17 SINGLE-FAMILY DETACHED (ESTATE LOTS-75' WIDE LOTS) • 10 SINGLE-FAMILY DETACHED (FRONT-LOAD GARAGES) • 33 SINGLE-FAMILY ATTACHED (FRONT-LOAD GARAGES FROM LANE, MODIFICATION REQUESTED AS A PART OF VOZ CONDITIONAL USE APP.) • 49 SINGLE-FAMILY ATTACHED (REAR-LOAD GARAGES)
PHASE 2	-----	0 DWELLING UNITS TOTAL 1 COMMERCIAL LOT (NO DWELLING UNITS)
PHASE 3	-----	143 DWELLING UNITS TOTAL • 9 SINGLE-FAMILY DETACHED (ESTATE LOTS-75' WIDE LOTS) • 14 SINGLE-FAMILY DETACHED (FRONT-LOAD GARAGES) • 36 SINGLE-FAMILY DETACHED (REAR-LOAD GARAGES) • 84 SINGLE-FAMILY ATTACHED (REAR-LOAD GARAGES)
PHASE 4	-----	131 DWELLING UNITS TOTAL • 22 SINGLE-FAMILY DETACHED (ESTATE LOTS-75' WIDE LOTS) • 77 SINGLE-FAMILY DETACHED (FRONT-LOAD GARAGES) • 32 SINGLE-FAMILY DETACHED (REAR-LOAD GARAGES)
PHASE 5	-----	87 DWELLING UNITS TOTAL • 46 SINGLE-FAMILY DETACHED (AGE-QUALIFIED FRONT-LOAD GARAGES) • 41 SINGLE-FAMILY DETACHED (AGE-QUALIFIED REAR-LOAD GARAGES)

Remaining Build-out as of September 2022
Multifamily (Low-Rise) Housing: 102 units
Single Family - Detached: 160 units
Senior Adult Detached: 87 units
Single Family - Attached: 68 units



THIS SHEET SHALL SERVE AS A REVISED PRELIMINARY PLAN SHEET. THIS SHEET WILL SUPERCEDE THE OVERALL PHASING PLAN (PRELIMINARY PLAN SHEET 7 OF 179) IN THE APPROVED PRELIMINARY PLAN. CONDITIONAL PRELIMINARY PLAN APPROVAL WAS OBTAINED ON NOVEMBER 17, 2015.

OVERALL PHASING PLAN & REVISED PRELIMINARY PLAN	PHASE 4 FINAL SUBDIVISION PLAN/REVISED PRELIMINARY SUBDIVISION PLAN & LOT ADD-ON PLAN FOR LEGACY PARK
DATE: AUGUST 12, 2022	MECHANICSBURG BOROUGH, CUMBERLAND COUNTY, PA
REVISION	NO. 8 OF 76
DWG. NO. 11-0950-01-E	FILED NO. FOR PIONEER MANAGEMENT BY:
F.1111-0950-01-G44-Phase4-Phasing.dwg	
MANAGER: JAMES C. HENKE SURV. CHIEF: RC FIELDBOOK NO.:	
DESIGN BY: JDB/KWG CHKO BY: RC VALUE:	
DRAWING REFERENCE: F.1111-0950-01-G44-Phase4-Phasing.dwg	
XREFS:	
CLIENT: LANDMARK HOMES c/o MR. CLIFF WEAVER 1737 WEST MAIN STREET EPHRATA, PA 17522 (717) 733-1536	
SCALE: 1" = 200' 400' 600'	
111 Millerville Road, Lancaster, PA 17603 Phone (717) 481-5500 • Fax (717) 481-4955 Email: www.pioneermanagementllc.com Website: www.pioneermanagementllc.com	

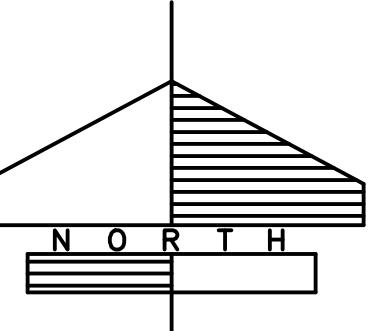
LEGEND

PROPOSED PHASING LINE

TENTATIVE CONSTRUCTION SCHEDULE

PHASE	ESTIMATED COMPLETION
PHASE 1	BEGINNING SPRING OF 2016
PHASE 2	BEGINNING SPRING OF 2018
PHASE 3	BEGINNING SPRING OF 2020
PHASE 4	BEGINNING FALL OF 2022
PHASE 5	BEGINNING SPRING OF 2023 (SCHEDULE SUBJECT TO CHANGE)

THE SOLE PURPOSE OF THIS PLAN IS TO IDENTIFY THE ANTICIPATED ONE-WAY AND TWO-WAY TRAFFIC FLOW PATTERNS WHEN THE DEVELOPMENT IS FULLY COMPLETE.

**DWELLING SCHEDULE**

PHASE 1	-----
	325 DWELLING UNITS TOTAL
	• 216 MULTI-FAMILY DWELLING UNITS (APTS.)
	• 17 SINGLE-FAMILY DETACHED (ESTATE LOTS-75' WIDE LOTS)
	• 10 SINGLE-FAMILY DETACHED (FRONT-LOAD GARAGES)
	• 33 SINGLE-FAMILY ATTACHED (FRONT-LOAD GARAGES FROM LANE, MODIFICATION REQUESTED AS A PART OF VOZ CONDITIONAL USE APP.)
	• 49 SINGLE-FAMILY ATTACHED (REAR-LOAD GARAGES)
PHASE 2	-----
	• 0 DWELLING UNITS TOTAL
	• 1 COMMERCIAL LOT (NO DWELLING UNITS)
PHASE 3	-----
	143 DWELLING UNITS TOTAL
	• 9 SINGLE-FAMILY DETACHED (ESTATE LOTS-75' WIDE LOTS)
	• 14 SINGLE-FAMILY DETACHED (FRONT-LOAD GARAGES)
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PHASE 5	-----
	87 DWELLING UNITS TOTAL
	• 46 SINGLE-FAMILY DETACHED (AGE-QUALIFIED FRONT-LOAD GARAGES)
	• 41 SINGLE-FAMILY DETACHED (AGE-QUALIFIED REAR-LOAD GARAGES)

**ONE-WAY & TWO-WAY TRAFFIC FLOW PLAN**

PHASE 4 FINAL SUBDIVISION PLAN/REVISED ADD-ON PLAN FOR PRELIMINARY SUBDIVISION PLAN

LEGACY PARK CUMBERLAND COUNTY, PA

PIONEER Management, LLCCLIENT
LANDMARK HOMES
c/o MR. CLIFF WEAVER
1737 WEST MAIN STREET
EPHRATA, PA 17522
(717) 733-1536DRAWING REFERENCE:
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XREFS:

TO E:\111-0950-01\G\Phase 4\Traffic\One-Way\OneWayTrafficPlan\Phase 4 Final Subdivision Plan & Revised Add-on Plan.dwg

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DWG. NO. 11-0950-01-E

DATE: OCT. 3, 2022

SHEET NO. 1 OF 1

NO. 1

REVISION