
APPENDIX F
SIGNAL WARRANT ANALYSIS- LITTLE EAST NECK RD
AT SITE DRIVEWAY,

N+P Engineering, Architecture & Land Surveying, PLLC, December 2024

SIGNAL WARRANT ANALYSIS

Suffolk Technology Park Driveway

Wyandanch, Town of Babylon, New York

November 2024

Updated December 2024

N+P Job No.21022



NELSON + POPE

engineers • architects • surveyors

70 Maxess Road, Melville, NY 11747

631.427.5665 nelsonpope.com

Nelson + Pope has conducted a Traffic Signal Warrant Analysis to evaluate whether a traffic signal should be installed at the proposed intersection of Little East Neck Road and the Suffolk Technology Park Center Driveway in the Hamlet of Wyandanch, Town of Babylon, Suffolk County, New York. This analysis was performed in accordance with the latest version of the Federal Manual on Uniform Traffic Control Devices (MUTCD), taking into account existing traffic volumes on Little East Neck Road as well as projected future traffic volumes following the construction of the Suffolk Technology Park. Below is a summary of the pertinent site information and the assessment of each warrant.

EVALUATION OF WARRANTS

The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants and other factors related to existing operation and safety of the study location:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

The satisfaction of a traffic signal warrant, or warrants shall not in itself require the installation of a traffic control signal. The signal warrant is the threshold criteria that should be met in order to consider the installation of a traffic control signal.

EXISTING CONDITIONS

Existing Roadway Condition

Little East Neck Road is a north/south minor arterial roadway under the jurisdiction of the Town of Babylon. Within the vicinity of the study area, it provides one travel lane in each direction. Along Little East Neck Road, the average annual daily traffic (AADT) volume is approximately 10,444 vehicles per day (source: Traffic Volumes collected by Nelson + Pope in October 2024). This section of roadway is relatively flat and straight with a posted speed limit of 30 mph.

Traffic Data

Automatic Traffic Recorder (ATR) machines were installed on Little East Neck Road in the vicinity of the site for a period of seven (7) days (October 9, 2024– October 15, 2024) to collect hourly volumes.

Of the nine warrants listed above, warrants 1, 2 and 3 were considered applicable for evaluation for this location. At this location Little East Neck Road will be considered the Major Street and Site Access will be considered the Minor Street. Signal Warrant Analysis 7, Crash Experience was not studied since the intersection does not currently exist and would not have any accident records.

FUTURE CONDITIONS

Trip Generation

Since the proposed development has not yet been constructed, daily trip generation rates were used to estimate the future traffic volumes expected to access the site driveway on Little East Neck Road. As outlined in the Traffic Impact Study submitted to the Town for this project, the trip generation for the proposed project was derived from the rates gathered from traffic data at Heartland Business Center (“HBC”), which consists of over 40 buildings with a total area of 4,374,599 square feet, of which 3,918,655 square feet are currently occupied. Hourly trip generation rates for the weekday between 7 AM and 7 PM were calculated based on the data collected at HBC. These rates were then applied to the square footage of the proposed project, along with the trip distribution at the driveway was utilized to estimate the future traffic volumes at the site driveway.

2027 Build Conditions

The Build Conditions Warrant Analysis includes the use of the No Build Conditions volumes as well as the anticipated volumes of traffic for the proposed project.

A description and analysis of each of the warrants is provided below and the detailed analyses for each warrant are presented in the attachments:

Warrant 1, Eight Hour Vehicular Volume

This Warrant is intended for use at locations where a significant amount of intersecting traffic is the main factor for considering the installation of a traffic control signal, or where the traffic volume on a major street is so high that vehicles on a minor intersecting street experience excessive delays.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exist for each of any 8 hours of an average day:

- A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or*
- B. The vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.*

In applying each condition, the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours.

Evaluation of Warrant 1

Build Conditions:

As indicated in the HCSC7 Warrant Report appended, volume thresholds for Condition A and B are not met for eight (8) hours but the combination of Conditions A and B are met for eight (8) hours; **therefore, this Warrant is satisfied.**

Warrant 2, Four Hour Vehicular Volume

This warrant applies where volume of intersecting traffic is the principal reason for consideration of a traffic signal. The warrant is satisfied when, for each of four hours of an average day, a point representing the number of vehicles on the artery (in both directions) and the number of vehicles on the higher-volume side road (one direction only) is plotted on a graph. All four points must fall above the appropriate curve (Figure 4C-1) in the MUTCD). The artery and side road volumes are for the same four hours but do not need to be four consecutive hours. When the 85th percentile speed of artery traffic exceeds forty miles per hour, the 4-hour volumes are plotted on a second curve (Figure 4C-2 in the MUTCD). These curves are included in the attached Warrant analyses summary work sheets.

Evaluation of Warrant 2

Build Conditions: Based on an interpretation of Figure 4C-1 in the MUTCD, the weekday traffic volumes needed to meet this warrant on Little East Neck Road and the site access fall above the curve for 5 of 12 hours studied on an average weekday during the Build conditions. **Therefore, Warrant 2 is satisfied.**

Warrant 3, Peak-Hour

This Warrant is intended for application “only in unusual cases, 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.” As the proposed development consists of warehousing and industrial space, this Warrant is applicable.

This warrant applies at locations where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

- A. *If all three of the following conditions exists for the same 1 hour (any four consecutive 15-minute periods) of an average day:*
 1. *The total stopped time delay experienced by the traffic on one minor- street approach (one direction only) controlled by a STOP sign equals or exceeds:*

- 4 vehicle-hours for one-lane approach; or 5 vehicle-hours for a two-lane approach, and*
- 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and*
 - 3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.*
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figures 4C-3 in the MUTCD for the existing combination of approach volumes. When the 85th percentile speed of artery traffic exceeds forty miles per hour, the peak hour volumes are plotted on a second curve (Figure 4C-4 in the MUTCD). These curves are included in the attached Warrant analyses summary work sheets.*

Evaluation of Warrant 3

Build Conditions: Based on an interpretation of Figure 4C-3 in the MUTCD, the volumes needed to meet this warrant on Little East Neck Road and the site access fall above the curve for 3 out of the 12 hours studied on an average weekday during the Build conditions. ***Therefore, Warrant 3 is satisfied.***

Warrant Summary

The results of the signal warrant analysis based on the guidelines provided in the MUTCD demonstrate that all of the three (3) referenced signal warrants were met during the weekday for the 2027 Build conditions.

CONCLUSIONS AND RECOMMENDATIONS

This report was prepared to determine whether a traffic signal should be installed at the proposed intersection of Little East Neck Road and the Suffolk Technology Park Center Driveway in the Hamlet of Wyandanch, Town of Babylon, Suffolk County, New York. Based on the analysis documented herein, MUTCD Warrant 1, Condition A/B (Eight-Hour Vehicular Volume), MUTCD Warrant 2 (Four-Hour Vehicular Volume) and MUTCD Warrant 3 (Peak Hour Vehicle Volumes) are met. As such, signalization is warranted at the intersection of the proposed intersection of Little East Neck Road and the Suffolk Technology Park Center Driveway.

ATTACHMENTS

HCS7 Warrants Report

HCS7 Warrants Report

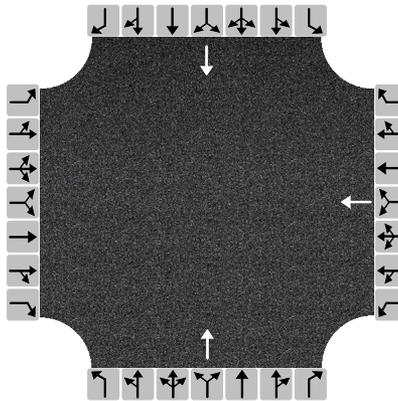
Project Information

Analyst	HM	Date	11/20/2024
Agency	N+P	Analysis Year	2024
Jurisdiction	Town of Babylon	Time Period Analyzed	
Project Description	Little E Neck Rd @ N Site Driveway - Suffolk Technology Park		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	30	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	1700		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	0	0	0	1	0	0	1	0	0	1	0
Lane Usage					T			T			T	
Vehicle Volumes Averages (veh/h)	0	0	0	0	173	0	0	457	0	0	394	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	993	93	1086	0	0	No	No	Yes	Yes	No	No	No	No	No
08 - 09	956	70	1026	0	0	No	No	No	Yes	No	No	No	No	No
09 - 10	741	77	818	0	0	No	No	No	Yes	No	No	No	No	No
10 - 11	657	83	740	0	0	No	No	No	Yes	No	No	No	No	No
11 - 12	609	122	731	0	0	No	Yes	No	Yes	No	No	No	No	No
12 - 13	699	173	872	0	0	Yes	Yes	No	Yes	No	No	No	No	No
13 - 14	765	142	907	0	0	No	Yes	Yes	Yes	No	No	No	No	No
14 - 15	880	153	1033	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
15 - 16	1003	264	1267	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
16 - 17	1039	360	1399	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	998	362	1360	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	884	181	1065	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Total	10224	2080	12304	0	0	6	8	7	12	5	0	3	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	✓
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 2: Four-Hour Vehicular Volume	✓
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	✓
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

Site Daily Volumes Calculation Table

Direction of Travel

NB
SB
WB

Heartland SF 3918655
Suffolk Tech SF 1596.921



	Cars In					Cars Out				
	Heartland In	Rate	Suffolk In	20% NB	45% SB	Heartland Out	Rate	Suffolk Out	80% Out	20% Out NB
7-8am	651	0.166	265	53	119	218	0.056	89	71	18
8-9am	686	0.175	280	56	126	172	0.044	70	56	14
9-10am	493	0.126	201	40	90	187	0.048	76	61	15
10-11am	310	0.079	126	25	57	208	0.053	85	68	17
11-12pm	258	0.066	105	21	47	325	0.083	132	106	26
12-1pm	388	0.099	158	32	71	467	0.119	190	152	38
1-2pm	378	0.096	154	31	69	395	0.101	161	129	32
2-3pm	303	0.077	123	25	56	417	0.106	170	136	34
3-4pm	342	0.087	139	28	63	771	0.197	314	251	63
4-5pm	504	0.129	205	41	92	1068	0.273	435	348	87
5-6pm	440	0.112	179	36	81	1085	0.277	442	354	88
6-7pm	329	0.084	134	27	60	531	0.136	216	173	43

	Trucks In					Trucks Out			
	Heartland In	Rate	Suffolk In	30% NB	15% SB	Heartland Out	Rate	Suffolk Out	100% Out
7-8am	24	0.006	10	3	1	53	0.014	22	22
8-9am	30	0.008	12	4	2	35	0.009	14	14
9-10am	41	0.010	17	5	3	39	0.010	16	16
10-11am	52	0.013	21	6	3	38	0.010	15	15
11-12pm	59	0.015	24	7	4	39	0.010	16	16
12-1pm	51	0.013	21	6	3	52	0.013	21	21
1-2pm	61	0.016	25	7	4	33	0.008	13	13
2-3pm	62	0.016	25	8	4	41	0.010	17	17
3-4pm	51	0.013	21	6	3	30	0.008	12	12
4-5pm	42	0.011	17	5	3	29	0.007	12	12
5-6pm	31	0.008	13	4	2	21	0.005	9	9
6-7pm	34	0.009	14	4	2	20	0.005	8	8

	Little E Neck Rd	
	NB	SB
7-8am	568	230
8-9am	561	193
9-10am	388	200
10-11am	324	224
11-12pm	262	241
12-1pm	264	285
1-2pm	340	282
2-3pm	372	383
3-4pm	367	473
4-5pm	348	463
5-6pm	369	418
6-7pm	371	377

	Final Volumes		
	NB	SB	WB
7-8am	642	351	93
8-9am	635	321	70
9-10am	448	293	77
10-11am	373	284	83
11-12pm	317	292	122
12-1pm	340	359	173
1-2pm	410	355	142
2-3pm	438	442	153
3-4pm	464	539	264
4-5pm	481	558	360
5-6pm	497	501	362
6-7pm	445	439	181

ATR Data

TRAFFIC DATABANK LLC

716 S SIXTH AVE
MT. VERNON NY 10550

Site Code:
Station ID:
LITTLE EAST NECK RD
BABYLON,NY
Latitude: 0' 0.0000 Undefined

Start Time	07-Oct-24		08-Oct-24		09-Oct-24		10-Oct-24		11-Oct-24		Weekday Average		12-Oct-24		13-Oct-24	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	*	*	35	78	41	74	30	84	35	79	58	105	42	76
01:00	*	*	*	*	26	44	23	40	21	36	23	40	34	49	40	48
02:00	*	*	*	*	19	26	20	21	20	38	20	28	13	38	34	30
03:00	*	*	*	*	59	12	50	13	53	22	54	16	50	30	51	24
04:00	*	*	*	*	100	50	86	40	101	44	96	45	63	43	36	35
05:00	*	*	*	*	265	44	232	47	222	56	240	49	84	47	58	27
06:00	*	*	*	*	469	152	445	139	413	124	442	138	163	73	121	60
07:00	*	*	*	*	670	226	662	215	568	230	633	224	193	108	144	95
08:00	*	*	*	*	779	216	675	188	561	193	672	199	211	128	152	94
09:00	*	*	*	*	475	196	480	188	388	200	448	195	266	171	248	130
10:00	*	*	*	*	285	203	300	203	324	224	303	210	279	183	289	173
11:00	*	*	*	*	281	237	298	209	262	241	280	229	302	206	276	220
12:00 PM	*	*	*	*	260	281	271	272	264	285	265	279	325	284	310	209
01:00	*	*	*	*	334	327	329	284	340	282	334	298	342	264	321	227
02:00	*	*	*	*	382	379	335	362	372	383	363	375	336	290	352	254
03:00	*	*	*	*	352	482	353	427	367	473	357	461	324	353	252	308
04:00	*	*	*	*	371	446	375	380	348	463	365	430	278	334	257	259
05:00	*	*	*	*	347	331	337	445	369	418	351	398	337	285	258	228
06:00	*	*	*	*	290	441	343	422	371	377	335	413	365	221	266	209
07:00	*	*	*	*	190	265	236	290	310	283	245	279	291	149	233	178
08:00	*	*	*	*	129	228	187	311	221	355	179	298	265	167	202	239
09:00	*	*	*	*	125	181	131	214	146	295	134	230	169	240	133	251
10:00	*	*	*	*	121	183	122	167	123	228	122	193	107	261	122	187
11:00	*	*	*	*	60	166	70	169	76	178	69	171	70	174	66	122
Total Day	0	0	0	0	6424	5194	6401	5120	6270	5512	6365	5277	4925	4203	4263	3683
AM Peak	-	-	-	-	08:00	11:00	08:00	07:00	07:00	11:00	08:00	11:00	11:00	11:00	10:00	11:00
Vol.	-	-	-	-	779	237	675	215	568	241	672	229	302	206	289	220
PM Peak	-	-	-	-	14:00	15:00	16:00	17:00	14:00	15:00	16:00	15:00	18:00	15:00	14:00	15:00
Vol.	-	-	-	-	382	482	375	445	372	473	365	461	365	353	352	308

TRAFFIC DATABANK LLC

716 S SIXTH AVE
MT. VERNON NY 10550

Site Code:
Station ID:
LITTLE EAST NECK RD
BABYLON, NY
Latitude: 0' 0.0000 Undefined

Start Time	14-Oct-24		15-Oct-24		16-Oct-24		17-Oct-24		18-Oct-24		Weekday Average		19-Oct-24		20-Oct-24	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	30	52	42	60	*	*	*	*	*	*	36	56	*	*	*	*
01:00	23	23	26	35	*	*	*	*	*	*	24	29	*	*	*	*
02:00	19	13	18	23	*	*	*	*	*	*	18	18	*	*	*	*
03:00	46	13	73	15	*	*	*	*	*	*	60	14	*	*	*	*
04:00	68	35	102	47	*	*	*	*	*	*	85	41	*	*	*	*
05:00	173	39	227	55	*	*	*	*	*	*	200	47	*	*	*	*
06:00	320	103	429	125	*	*	*	*	*	*	374	114	*	*	*	*
07:00	449	177	650	233	*	*	*	*	*	*	550	205	*	*	*	*
08:00	488	164	699	208	*	*	*	*	*	*	594	186	*	*	*	*
09:00	352	165	461	184	*	*	*	*	*	*	406	174	*	*	*	*
10:00	316	182	305	190	*	*	*	*	*	*	310	186	*	*	*	*
11:00	283	230	277	204	*	*	*	*	*	*	280	217	*	*	*	*
12:00 PM	295	291	276	257	*	*	*	*	*	*	286	274	*	*	*	*
01:00	379	306	342	287	*	*	*	*	*	*	360	296	*	*	*	*
02:00	352	303	349	342	*	*	*	*	*	*	350	322	*	*	*	*
03:00	318	429	331	485	*	*	*	*	*	*	324	457	*	*	*	*
04:00	286	415	338	404	*	*	*	*	*	*	312	410	*	*	*	*
05:00	351	497	319	353	*	*	*	*	*	*	335	425	*	*	*	*
06:00	229	346	255	429	*	*	*	*	*	*	242	388	*	*	*	*
07:00	174	250	187	267	*	*	*	*	*	*	180	258	*	*	*	*
08:00	155	196	147	215	*	*	*	*	*	*	151	206	*	*	*	*
09:00	113	141	125	175	*	*	*	*	*	*	119	158	*	*	*	*
10:00	124	153	140	148	*	*	*	*	*	*	132	150	*	*	*	*
11:00	75	111	73	130	*	*	*	*	*	*	74	120	*	*	*	*
Total Day	5418	4634	6191	4871	0	0	0	0	0	0	5802	4751	0	0	0	0
AM Peak	08:00	11:00	08:00	07:00	-	-	-	-	-	-	08:00	11:00	-	-	-	-
Vol.	488	230	699	233	-	-	-	-	-	-	594	217	-	-	-	-
PM Peak	13:00	17:00	14:00	15:00	-	-	-	-	-	-	13:00	15:00	-	-	-	-
Vol.	379	497	349	485	-	-	-	-	-	-	360	457	-	-	-	-

Comb. Total	10052	11062	11618	11521	11782	22195	9128	7946
ADT	ADT 10,444	AADT 10,444						