

High Street Field Visit Memorandum

To: Village of Hastings on Hudson
From: Sam Schwartz Engineering, DPC
Date: July 10, 2020
Re: High Street Field Observations
Project No: 17-01-2681

1. Overview

Sam Schwartz Engineering, DPC (“*Sam Schwartz*”) has been asked to evaluate traffic operations and safety at four (4) intersections along High Street in the Village of Hastings-on-Hudson. The intersections are Rose Street, James Street, Hudson Street, and Warren Street.

As part of the evaluation, *Sam Schwartz* reviewed traffic and pedestrian volume data and conducted field measurements and observations. The information was collected to determine the need for safety improvements and assess operational impacts of improvements along the corridor. Improvements evaluated included implementing all-way stop control at each of the four intersections and installing pedestrian infrastructure along the corridor. This memorandum documents these efforts and the results of the analyses performed.

2. Existing Conditions

On March 4, 2020, *Sam Schwartz* conducted field observations and measurements, including stopping sight distance deficiencies, roadway widths, and sidewalk inventories.

High Street is an eastbound/westbound two-lane municipal roadway with no marked shoulders, a 28-foot wide pavement width with one 14-foot lane in each direction, and steep inclines. The posted speed within the study area is 25 MPH. On street parking is permitted along both sides of the street at all times. Traffic flow along High Street between Rose Street and Warren Street is uninterrupted, with no stop signs, yield signs, or traffic signals. All intersecting minor streets are two-way stop controlled to give High Street the right of way. Several children were observed crossing or walking along High Street as part of their morning routine getting to school. Along High Street, there is one walkway segment along the north curb line from Rose Street to James Street. Between Rose Street and Warren Street, there are no curb ramps or crosswalks along major and minor streets. Rose Street, James Street, Hudson Street and Warren Street support two-way traffic, but there are not lane delineations and pavement markings indicating two-way traffic on any of these cross streets. Intersection data measurements can be found in **Appendix A**.

3. Preliminary Safety and Complete Streets Analysis

Crash data and field observations were also reviewed to evaluate vehicular and pedestrian safety along the corridor and the area surrounding it. Pedestrians observed during the March 2020 field visit included children on their way to school, people walking their dogs, and adults

presumably going to work. High Street has minimal pedestrian facilities and no marked shoulders, forcing these pedestrians to walk in the travel lanes. These conditions are not compliant with the Village of Hastings-on-Hudson Complete Streets Policy, which was adopted in October of 2014.

Further, there have been 22 bicycle and pedestrian crashes from years 2015 to 2019 along High Street and its intersecting roads, with 2 crashes occurring on High Street at James Street. Almost half of the total crashes (10) occurred between 7:30 – 8:30 AM and 3:00 – 4:00PM, when there are likely to be higher volumes of walking schoolchildren and motor vehicles. The safety of pedestrians in the Hastings-on-Hudson community could likely be improved by the implementation of a comprehensive pedestrian facility network that connects residential communities and desirable destinations such as schools, parks, and transit. A vehicle crash analysis was not completed as part of this evaluation.

4. Traffic Control Warrants and Traffic Volume Review

Consideration was given to implementing all-way stop control at intersections along High Street to improve traffic and pedestrian safety. The FHWA Manual on Uniform Traffic Control Devices (MUTCD) guidance (Section 2B.07) was utilized to determine if an all-way stop condition should be installed at the intersection of High Street and James Street. The evaluation was performed using 2020 traffic growth estimates from New York State Department of Transportation Traffic Count Hourly Report Data (included as **Appendix B**).

The MUTCD guidance states *“The vehicular volume entering the intersection from the major street approaches (total of both approaches) average at least 300 vehicles per hour for any 8 hours of an average day; and The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) average at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.”*

NYS traffic data collection from 2015 at High Street and James Street indicates that during a typical weekday in August, there is only one hour where High Street traffic exceeded 300 vehicles; however, traffic volume adjustments were required to account for yearly traffic growth and seasonal fluctuations. To adjust from 2015 to 2020, we assumed a growth rate of 4% over the 5-year period. This increase is based on the 2010-2035 Regional Transportation Plan, published by New York Metropolitan Transportation Council (NYMTC) in 2010 and is a projection of anticipated employment growth in the region. Additionally, because the count data was collected outside of the school year, we are using an industry standard of 10% to increase the traffic volume numbers. The resultant estimated hourly traffic volumes are included in **Appendix B**.

Even with the traffic volume adjustments, both of which grew the traffic estimate from 2015 NYS traffic data, High Street did not meet the guidance in the MUTCD as a major street approach. In the 2020 hourly traffic volume estimates without a seasonal adjustment, there was only one hour estimated to have a volume greater than 300 vehicles. In 2020 traffic volume estimates that adjusted for seasonal fluctuation, only three hours in a typical weekday were estimated to have a volume is greater than 300 vehicles per hour. As a result, we do not expect a current data collection effort to yield a different conclusion.

Additionally, the minor street approach at Rose Street, James Street, Hudson Street, or Warren Street are not likely to have enough vehicle, pedestrian, and bicycle volumes to warrant a 4-way stop control as a minor street. Therefore, traffic volumes are not a basis for recommending 4-way stop at intersections along High Street in the study area.

5. Stopping Sight Distance Deficiencies

Per the MUTCD (Section 2B.07.05), “*Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop*” are also candidates for multi-way stop sign applications. High Street and James Street, in addition to High Street at Rose Street, Hudson Street and Warren Street, were observed to have significantly obstructed sight distances. Field observations and measurements were taken to evaluate the current sight distance from minor street approaches on High Street.

Sight distance standards are calculated using the speed of the road, type of traffic control, and typical reaction time to give vehicles adequate opportunity to avoid collision while maneuvering through an intersection. The sight distance standards on High Street were determined by NYSDOT Highway Design Manual guidelines for scenarios with minor street stop control and a design speed of 30 miles per hour (roadway speed limits are generally posted 5 MPH below the design speed). In these conditions, 355 feet of sight distance is required to the right in order to execute a left turn, and 290 feet of sight distance is required to the left in order to execute a right turn.

Based on our field observations, the only maneuver that has adequate sight distance at the four intersections investigated is the northbound left turn movement from Hudson Street onto High Street. Graphics depicting the stopping sight distance at these intersections can be found in **Appendix C**. The stopping sight distances at Rose Street, James Street, Hudson Street, and Warren Street were observed in March, meaning that visibility in summer months may be decreased due to overgrown vegetation, resulting in even shorter sight distances.

To address stopping sight distance deficiencies along this corridor, measures may be taken including roadway realignment, grading, speed limit adjustments, and altering traffic controls at intersections. Converting these intersections to 4-way stop control would eliminate the need for stopping sight distance requirements for minor approaches. Implementing 4-way stop control may also be one of the most feasible and cost-effective measures to address stopping sight distance deficiencies and corresponding safety issues.

6. Recommendations

To address stopping sight distance deficiencies from minor roads on High Street, it is feasible to implement all-way stop control at Rose Street, James Street, Hudson Street, or Warren Street intersections. Implementing all-way stop control at each of these intersections would eliminate the need for clear, lengthy sight distances along the length of High Street and would allow vehicles from minor streets to maneuver through the intersection more safely.

Given the presence of pedestrians and the Village of Hastings-on-Hudson’s Complete Streets Policy, it is recommended that Americans with Disabilities (ADA) compliant pedestrian facilities,

including curb ramps, crosswalks and sidewalks be implemented in this area. Next steps should include the design of these facilities, which will require a field survey to determine Right-of-Way constraints, subsurface utilities, ground utilities, and roadway elevation.

Appendix A

High Street And Warren Street Intersection



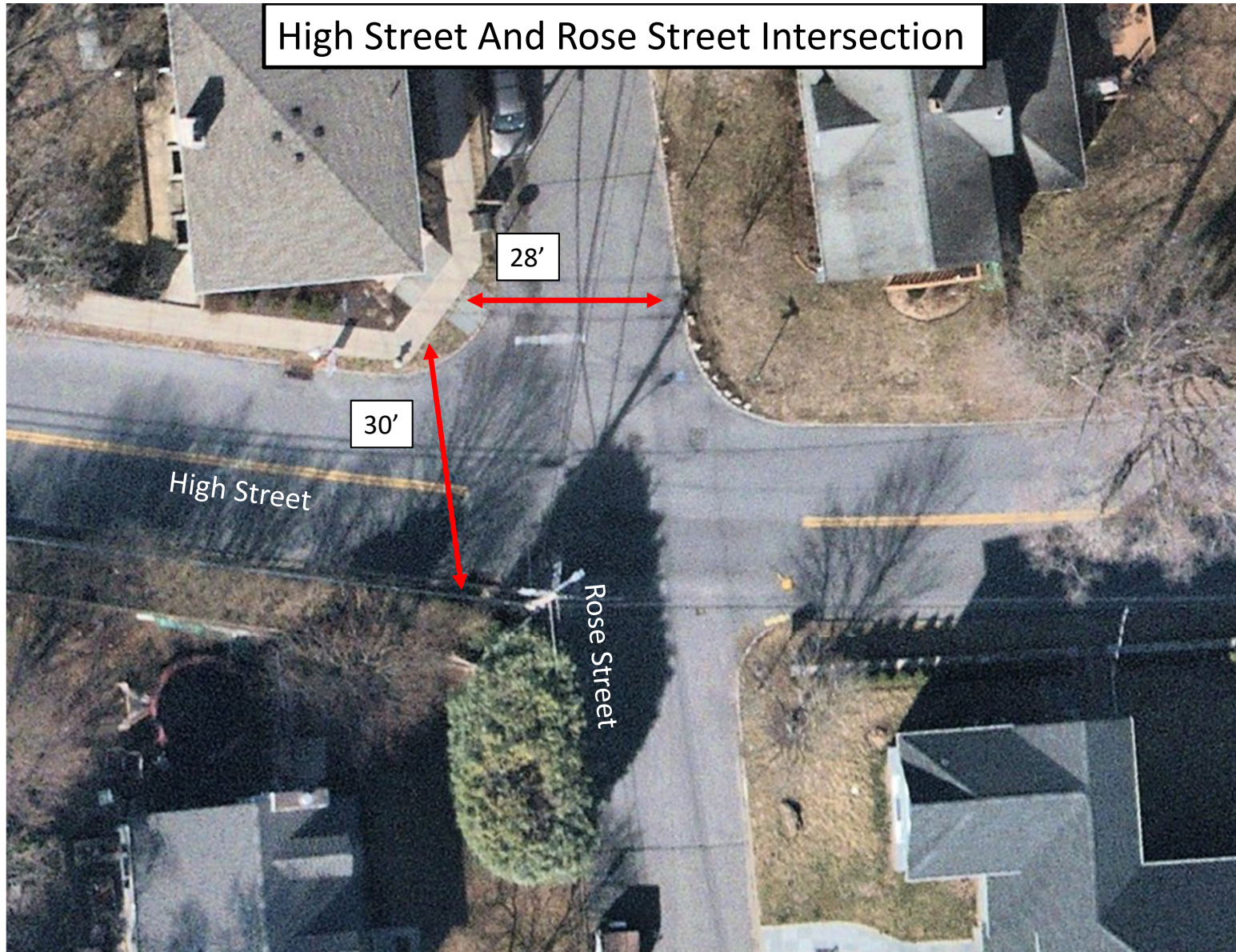
High Street And Hudson Street Intersection



High Street And James Street Intersection



High Street And Rose Street Intersection



Appendix B

STATION: 875551

New York State Department of Transportation

Traffic Count Hourly Report

Page 1 of 2

ROAD #: ROAD NAME: **HIGH ST** FROM: **JAMES ST** TO: **ROSE ST** COUNTY: **Westchester**
 DIRECTION: Eastbound FACTOR GROUP: 30 REC. SERIAL #: JA97 FUNC. CLASS: 19 VILLAGE:
 STATE DIR CODE: 6 WK OF YR: 34 PLACEMENT: 107 Ft E of James Street NHS: no LION#:
 DATE OF COUNT: 08/17/2015 @ REF MARKER: JURIS: County BIN:
 NOTES LANE 1: ADDL DATA: CC Stn: RR CROSSING:
 COUNT TYPE: AXLE PAIRS BATCH ID: DOT-R08V34ETDB51564 PMS SAMPLE:

COUNT TAKEN BY: ORG CODE: TDB INITIALS: dja PROCESSED BY: ORG CODE: DOT INITIALS: KCF

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
1	S																											
2	S																											
3	M																											
4	T																											
5	W																											
6	T																											
7	F																											
8	S																											
9	S																											
10	M																											
11	T																											
12	W																											
13	T																											
14	F																											
15	S																											
16	S																											
17	M																											
18	T	16	1	0	1	5	13	35	95	122	95	72	85	105	81	100	152	133	92	63	42	30	18	18				
19	W	17	6	1	1	5	8	36	94	95	91	79	85	78	87	103	106	140	215	102	73	39	37	28	14	1562	215	17
20	T	9	2	3	1	6	11	38	87	103	88	82	89	93	76	100	113	137	200	89	59	48	33	30	18	1515	200	17
21	F	4	7	1	3	4	12	28	89	97	97	70																
22	S																											
23	S																											
24	M																											
25	T																											
26	W																											
27	T																											
28	F																											
29	S																											
30	S																											
31	M																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)																								ADT
12	4	1	2	5	11	34	91	104	93	76	86	88	86	96	109	147	186	96	64	43	31	24	19	1508
<u>DAYS Counted</u>	<u>HOURS Counted</u>			<u>WEEKDAYS Counted</u>	<u>WEEKDAY Hours</u>	<u>AVERAGE WEEKDAY</u>		<u>Axle Adj. Factor</u>	<u>Seasonal/Weekday Adjustment Factor</u>	<u>ESTIMATED</u>														
						High Hour	% of day																	
4	94			4	94	186	12%	1.000	1.089	AADT 1385														

ROAD #: ROAD NAME: **HIGH ST** FROM: **JAMES ST** TO: **ROSE ST** COUNTY: **Westchester**
 STATION: **875551** STATE DIR CODE: **6** PLACEMENT: **107 Ft E of James Street** DATE OF COUNT: **08/17/2015**

STATION: 875551

New York State Department of Transportation

Traffic Count Hourly Report

Page 2 of 2

ROAD #: ROAD NAME: **HIGH ST** FROM: **JAMES ST** TO: **ROSE ST** COUNTY: **Westchester**
 DIRECTION: Westbound FACTOR GROUP: 30 REC. SERIAL #: JA97 FUNC. CLASS: 19 VILLAGE:
 STATE DIR CODE: 7 WK OF YR: 34 PLACEMENT: 107 Ft E of James Street NHS: no LION#:
 DATE OF COUNT: 08/17/2015 @ REF MARKER: JURIS: County BIN:
 NOTES LANE 1: ADDL DATA: CC Stn: RR CROSSING:
 COUNT TYPE: AXLE PAIRS BATCH ID: DOT-R08V34ETDB51564 PMS SAMPLE:

COUNT TAKEN BY: ORG CODE: TDB INITIALS: dja PROCESSED BY: ORG CODE: DOT INITIALS: KCF

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
1	S																											
2	S																											
3	M																											
4	T																											
5	W																											
6	T																											
7	F																											
8	S																											
9	S																											
10	M																											
11	T																											
12	W																											
13	T																											
14	F																											
15	S																											
16	S																											
17	M													101	90	103	137	133	126	98	64	61	33	22				
18	T	12	5	1	2	3	11	36	152	195	116	86	105	83	97	80	115	129	160	129	81	73	71	35	18	1795	195	8
19	W	22	3	2	6	6	10	30	154	176	133	85	107	109	108	101	107	138	138	131	88	74	50	41	26	1845	176	8
20	T	13	7	3	1	1	17	37	155	180	143	92	93	112	81	87	111	130	181	106	83	87	65	45	31	1861	181	17
21	F	14	4	2	3	5	8	42	153	158	133	71																
22	S																											
23	S																											
24	M																											
25	T																											
26	W																											
27	T																											
28	F																											
29	S																											
30	S																											
31	M																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)																							ADT	
15	5	2	3	4	12	36	154	177	131	84	102	101	97	90	109	134	153	123	88	74	62	38	24	1818
<u>DAYS Counted</u>	<u>HOURS Counted</u>			<u>WEEKDAYS Counted</u>	<u>WEEKDAY Hours</u>	<u>AVERAGE WEEKDAY</u>		<u>Axle Adj. Factor</u>	<u>Seasonal/Weekday Adjustment Factor</u>	<u>ESTIMATED</u>														
						High Hour	% of day																	
5	94			5	94	177	10%	1.000	1.089															
										AADT 1669														

ROAD #: 875551 ROAD NAME: **HIGH ST** FROM: **JAMES ST** TO: **ROSE ST** COUNTY: **Westchester**
 STATION: STATE DIR CODE: 7 PLACEMENT: 107 Ft E of James Street DATE OF COUNT: 08/17/2015

High Street from James Street to Rose Street - August 2015

HOURS	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

Eastbound High Street from James Street and Rose Street	M														105	81	100	152	133	92	63	42	30	18	18
	T	16	1	0	1	5	13	35	95	122	95	72	85	78	87	103	106	140	215	102	73	39	37	28	14
	W	17	6	1	1	5	8	36	94	95	91	79	85	94	77	99	118	158	194	103	61	42	24	20	26
	Th	9	2	3	1	6	11	38	87	103	88	82	89	93	76	100	113	137	200	89	59	48	33	30	18
	F	4	7	1	3	4	12	28	89	97	97	70													

Westbound High Street from James Street and Rose Street	M														101	90	103	137	133	126	98	64	61	33	22
	T	12	5	1	2	3	11	36	152	195	116	86	105	83	97	80	115	129	160	129	81	73	71	35	18
	W	22	3	2	6	6	10	30	154	176	133	85	107	109	108	101	107	138	138	131	88	74	50	41	26
	Th	13	7	3	1	1	17	37	155	180	143	92	93	112	81	87	111	130	181	106	83	87	65	45	31
	F	14	4	2	3	5	8	42	153	158	133	71													

Total	M														206	171	203	289	266	218	161	106	91	51	40
	T	28	6	1	3	8	24	71	247	317	211	158	190	161	184	183	221	269	375	231	154	112	108	63	32
	W	39	9	3	7	11	18	66	248	271	224	164	192	203	185	200	225	296	332	234	149	116	74	61	52
	Th	22	9	6	2	7	28	75	242	283	231	174	182	205	157	187	224	267	381	195	142	135	98	75	49
	F	18	11	3	6	9	20	70	242	255	230	141													
Weekday Average		27	9	3	5	9	23	71	245	282	224	159	188	190	183	185	218	280	339	220	152	117	93	63	43

LEGEND	
#	Hourly Volumes Greater Than 300 Vehicles

High Street from James Street to Rose Street - August 2020 Volume Adjustment

HOURS	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

Eastbound High Street from James Street and Rose Street	M														109	84	104	158	138	96	66	44	31	19	19
	T	17	1	0	1	5	14	36	99	127	99	75	88	81	90	107	110	146	224	106	76	41	38	29	15
	W	18	6	1	1	5	8	37	98	99	95	82	88	98	80	103	123	164	202	107	63	44	25	21	27
	Th	9	2	3	1	6	11	40	90	107	92	85	93	97	79	104	118	142	208	93	61	50	34	31	19
	F	4	7	1	3	4	12	29	93	101	101	73													

Westbound High Street from James Street and Rose Street	M														105	94	107	142	138	131	102	67	63	34	23
	T	12	5	1	2	3	11	37	158	203	121	89	109	86	101	83	120	134	166	134	84	76	74	36	19
	W	23	3	2	6	6	10	31	160	183	138	88	111	113	112	105	111	144	144	136	92	77	52	43	27
	Th	14	7	3	1	1	18	38	161	187	149	96	97	116	84	90	115	135	188	110	86	90	68	47	32
	F	15	4	2	3	5	8	44	159	164	138	74													

Total	M														214	178	211	300	276	227	168	111	94	53	42
	T	29	6	1	3	8	25	73	257	330	220	164	197	167	191	190	230	280	390	240	160	117	112	65	34
	W	41	9	3	7	11	18	68	258	282	233	170	199	211	192	208	234	308	346	243	155	121	77	64	54
	Th	23	9	6	2	7	29	78	251	294	241	181	190	213	163	194	233	277	396	203	147	140	102	78	51
	F	19	11	3	6	9	20	73	252	265	239	147													
Weekday Average		28	9	3	5	9	23	73	255	293	233	166	195	197	190	193	227	291	352	228	158	122	96	65	45

LEGEND	
#	Hourly Volumes Greater Than 300 Vehicles

High Street from James Street to Rose Street - 2020 School Year Adjustment

	HOURS	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
		To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To	To
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Eastbound High Street from James Street and Rose Street	M														120	92	114	174	152	106	73	48	34	21	21
	T	19	1	0	1	6	15	40	109	140	109	83	97	89	99	118	121	161	246	117	84	45	42	32	17
	W	20	7	1	1	6	9	41	108	109	105	90	97	108	88	113	135	180	222	118	69	48	28	23	30
	Th	10	2	3	1	7	12	44	99	118	101	94	102	107	87	114	130	156	229	102	67	55	37	34	21
	F	4	8	1	3	4	13	32	102	111	111	80													
Westbound High Street from James Street and Rose Street	M													116	103	118	156	152	144	112	74	69	37	25	
	T	13	6	1	2	3	12	41	174	223	133	98	120	95	111	91	132	147	183	147	92	84	81	40	21
	W	25	3	2	7	7	11	34	176	201	152	97	122	124	123	116	122	158	158	150	101	85	57	47	30
	Th	15	8	3	1	1	20	42	177	206	164	106	107	128	92	99	127	149	207	121	95	99	75	52	35
	F	17	4	2	3	6	9	48	175	180	152	81													
Total	M														236	195	232	330	304	250	185	122	103	58	46
	T	32	7	1	3	9	27	81	283	363	242	181	217	184	210	209	253	308	429	264	176	129	123	72	38
	W	45	10	3	8	13	20	75	284	310	257	187	219	232	211	229	257	338	380	268	170	133	85	70	60
	Th	25	10	6	2	8	32	86	276	324	265	200	209	235	179	213	257	305	436	223	162	154	112	86	56
	F	21	12	3	6	10	22	80	277	291	263	161													
Weekday Average		31	10	3	5	10	25	81	280	322	257	182	215	217	209	212	250	320	387	251	173	135	106	72	50

LEGEND	
#	Hourly Volumes Greater Than 300 Vehicles

Appendix C

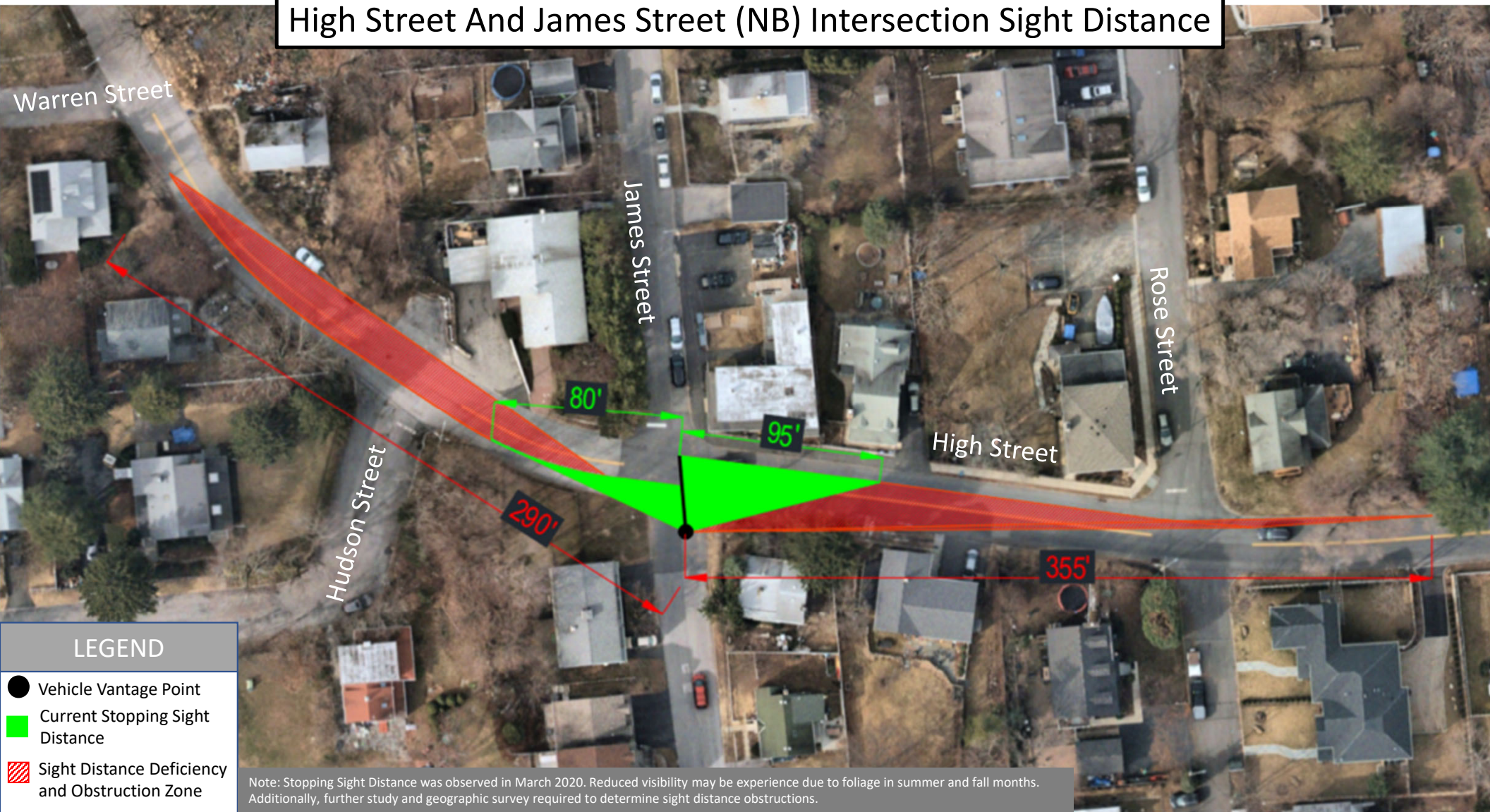
High Street And Warren Street Intersection Sight Distance



High Street And Hudson Street Intersection Sight Distance



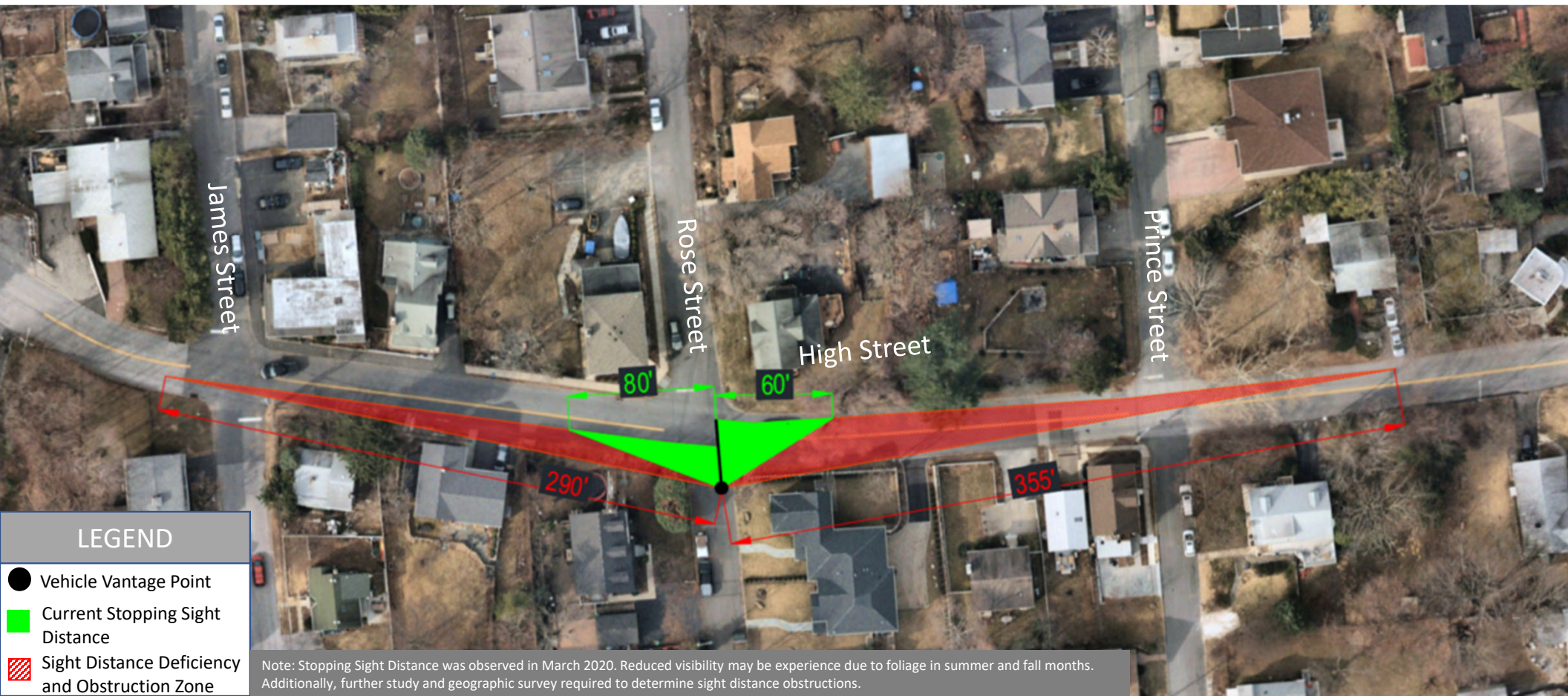
High Street And James Street (NB) Intersection Sight Distance



High Street And James Street (SB) Intersection Sight Distance



High Street And Rose Street (NB) Intersection Sight Distance



High Street And Rose Street (SB) Intersection Sight Distance

