Sam Schwartz
1 North Broadway, Suite 403
White Plains, NY 10601
(914) 340-0020
samschwartz.com

Sam Schwartz

High Street Traffic and Safety Operations Memorandum

To: Village of Hastings on Hudson
From: Sam Schwartz Engineering, DPC
Date: June 3, 2020
Re: High Street Traffic and Safety Operations
Project No: 17-01-2680

1. Overview

Sam Schwartz Engineering, DPC ("*Sam Schwartz*") has been asked to evaluate traffic operations and safety at three (3) intersections along High Street in the Village of Hastings-on-Hudson. The intersections are Rose Street, James 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, including the feasibility of installing a 4-way stop sign and pedestrian infrastructure. 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 a two-way, 25-MPH posted roadway with no shoulders, 28-foot wide pavement width, steep inclines and high traffic volumes in the AM peak hours. On street parking is permitted on both sides of the street. Along High Street between Rose Street and Hudson Street, there is no impeding traffic control in the form of stop signs, yield signs, or traffic signals. All intersecting minor streets are stop controlled to give High Street the right of way. Based on field observation, there are also several children who cross or walk along High Street as part of their morning routine getting to school. Along High Street, there is one walkway segment along the north curb 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, with lane delineations and pavement markings indicating two-way traffic being the clearest on James Street and Rose Street. Intersections, and their measurements can be found in **Appendix A.**

3. Preliminary Safety and Complete Streets Analysis

Preliminary crash data and field observations have also been 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 shoulder, forcing these pedestrians to walk in the travel lanes. These conditions are not in keeping with the Village of Hastings-on-Hudson Complete Streets Policy, which was adopted in October of 2014.

There have been 22 bicycle and pedestrian crashes from years 2015 to 2019 on 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 school children. 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 altering the traffic control at intersections along High Street to improve traffic and pedestrian safety, in this case installing a 4-way stop sign. 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 New York State Department of Transportation Traffic Count Hourly Report Data (included as **Appendix B**).

The MUTCD guidance requires "*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.*"

Based on the NYS traffic data, these volumes do not meet the guidance in the MUTCD as High Street (the major street approach) only has three hours in a typical day where the volume is greater than 300 vehicles per hour, therefore not meeting the volume threshold. It is noted that the data used is dated 8/17/2015. 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 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. Even with these calculations, the same three hours are estimated to exceed the guidance threshold. 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 volume to warrant a 4-way stop control as a minor street. Therefore, a 4-way stop control is not recommended by traffic volume for 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 Safety 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 the appropriate sight distance is turning left from Hudson Street onto High Street. Graphics depicting the stopping sight distance at these intersections can be found in **Appendix C.** It is important to note that the stopping sight distances at Rose Street, James Street, Hudson Street, and Warren Street were measured in March when trees and bushes were still bare. Visibility in the spring and summer months may be decreased due to foliage resulting in even shorter sight distances.

To address stopping sight distance 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 a 4-way stop control at Rose Street, James Street, Hudson Street, and Warren Street intersections. Implementing 4-way stop control at any of these intersections would eliminate the need for visibility along the length of High Street and would allow vehicles from minor streets to maneuver through the intersection more safely.

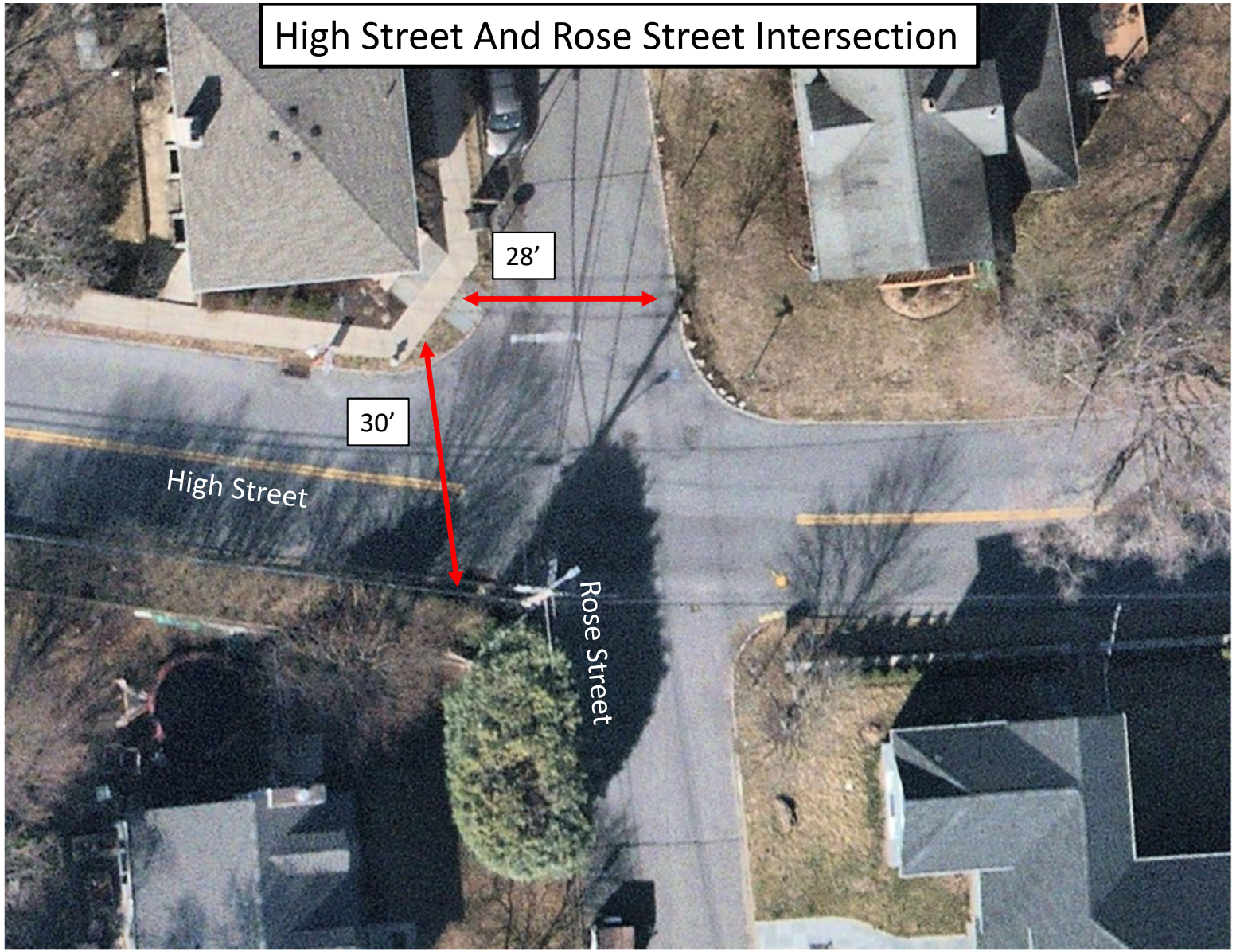
Given the presence of pedestrians and the Village of Hastings-on-Hudson Complete Streets Policy, it is recommended that Americans with Disabilities (ADA) compliant pedestrian facilities, including curb ramps, crosswalks and sidewalks be implemented in this area. Next steps should include the design of 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
28’
28’
Warren Street


High Street And Hudson Street Intersection
High Street
40’
30’
Hudson Street


High Street And James Street Intersection
29’
28’
High Street
James Street


High Street And Rose Street Intersection
28’
30’
High Street
Rose Street

Appendix B

New York State Department of Transportation

Traffic Count Hourly Report

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-R08V34ETDB5156 HPMS SAMPLE:
COUNT TAKEN BY: ORG CODE: TDB INITIALS: dja PROCESSED BY: ORG CODE: DOT INITIALS: KCF

DATE	DAY	12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
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													**105**	**81**	**100**	**152**	**133**	**92**	**63**	**42**	**30**	**18**	**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**	1562	215	17
19	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**	1534	194	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)

12	4	1	2	5	11	34	91	104	93	76	86	88	86	96	109	147	186	96	64	43	31	24	19	ADT 1508

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
4	94	4	94	186	12%	1.000	1.089

ESTIMATED

AADT

1385

New York State Department of Transportation

Traffic Count Hourly Report

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-R08V34ETDB5156 HPMS SAMPLE:
COUNT TAKEN BY: ORG CODE: TDB INITIALS: dja PROCESSED BY: ORG CODE: DOT INITIALS: KCF

DATE	DAY	12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
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**

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
5	94	5	94	177	10%	1.000	1.089

ESTIMATED

AADT

1669

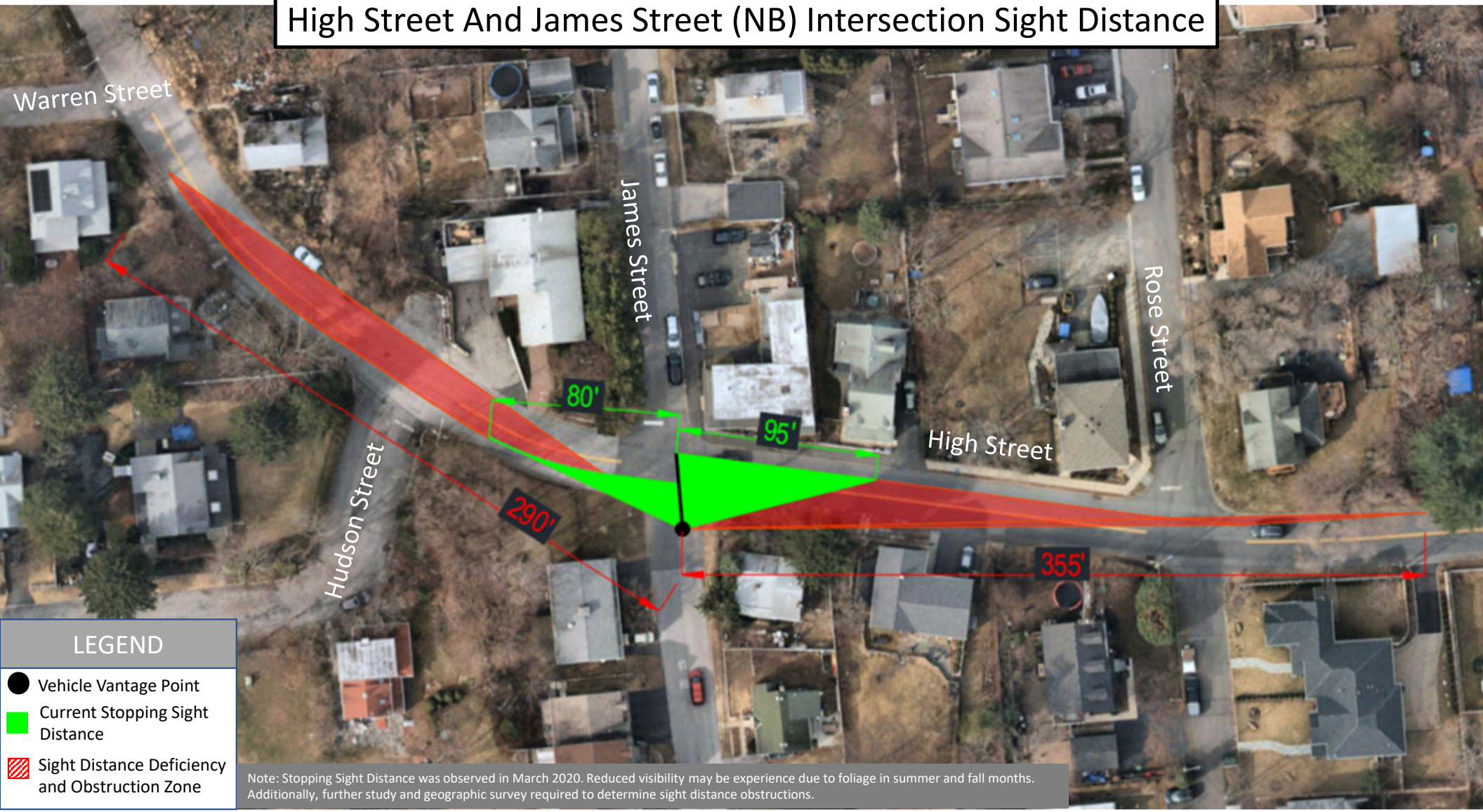
Appendix C

High Street And Warren Street Intersection Sight Distance

Note: Stopping Sight Distance was observed in March 2020. Reduced visibility may be experience due to foliage in summer and fall months. Additionally, further study and geographic survey required to determine sight distance obstructions.

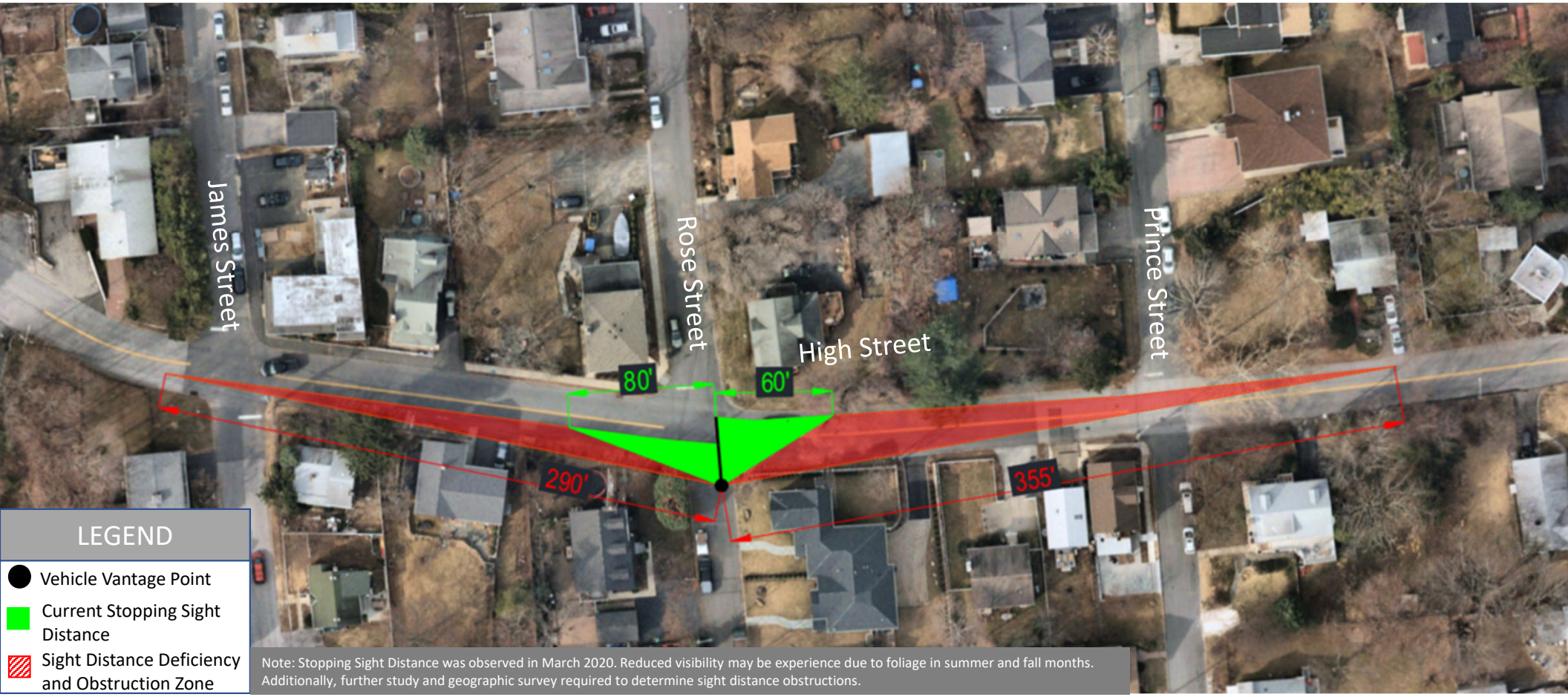

High Street And Hudson Street Intersection Sight Distance
Warren Street
290'
High Street
James Street
Rose Street
135'
Hudson Street
355'
LEGEND
Vehicle Vantage Point
Current Stopping Sight Distance
Sight Distance Deficiency and Obstruction Zone
Note: Stopping Sight Distance was observed in March 2020. Reduced visibility may be experience due to foliage in summer and fall months. Additionally, further study and geographic survey required to determine sight distance obstructions.

High Street And James Street (NB) Intersection Sight Distance

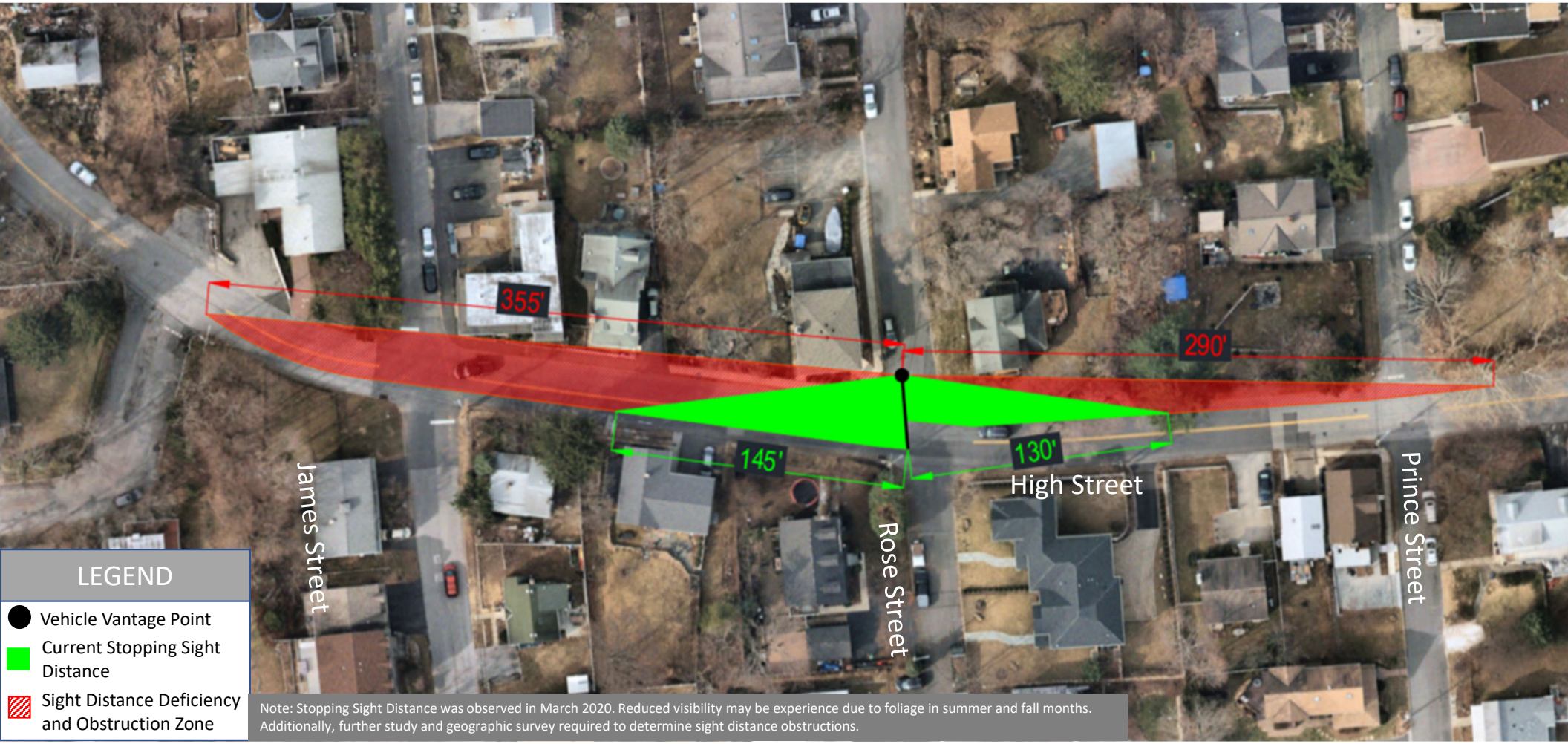


High Street And James Street (SB) Intersection Sight Distance

High Street And Rose Street (NB) Intersection Sight Distance



High Street And Rose Street (SB) Intersection Sight Distance



Note: Stopping Sight Distance was observed in March 2020. Reduced visibility may be experience due to foliage in summer and fall months. Additionally, further study and geographic survey required to determine sight distance obstructions.