

Traffic Study – Shrewsbury, MA  
**The Pointe at Hills Farm**

Monday, December 28, 2015

# Methodology

- **State Standards for Traffic Study**
  - Existing Conditions: 2015
  - Future Conditions: 2022 (with and without Project)
- **Traffic Counts**
  - April 2014
  - November 2014
- **Safety Analysis**
  - MassDOT data
  - Town of Shrewsbury Police Department data
- **Delay and Vehicle Queue Study**
- **Projections for Future Traffic**
- **Mitigation**
  - Improvements to Route 20 at Stoney Hill Road (west)
  - Pedestrian accommodations
  - Transportation Demand Management Plan

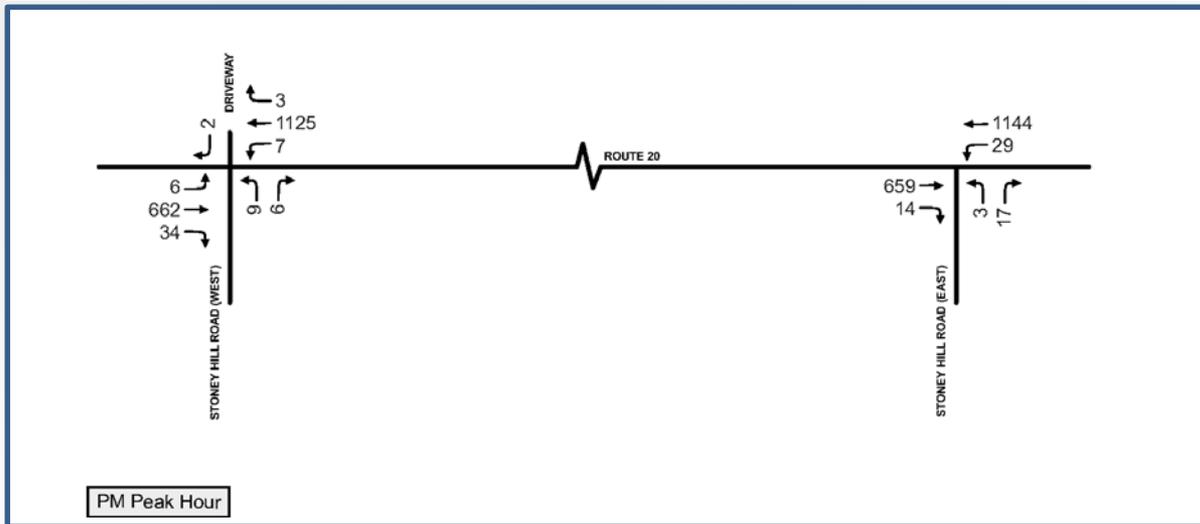
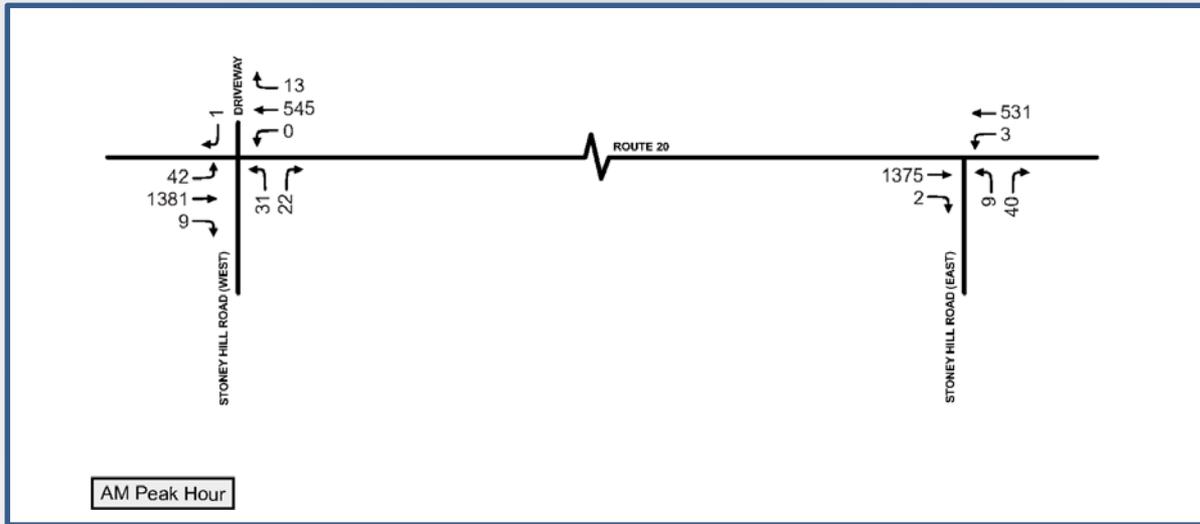
# Study Area



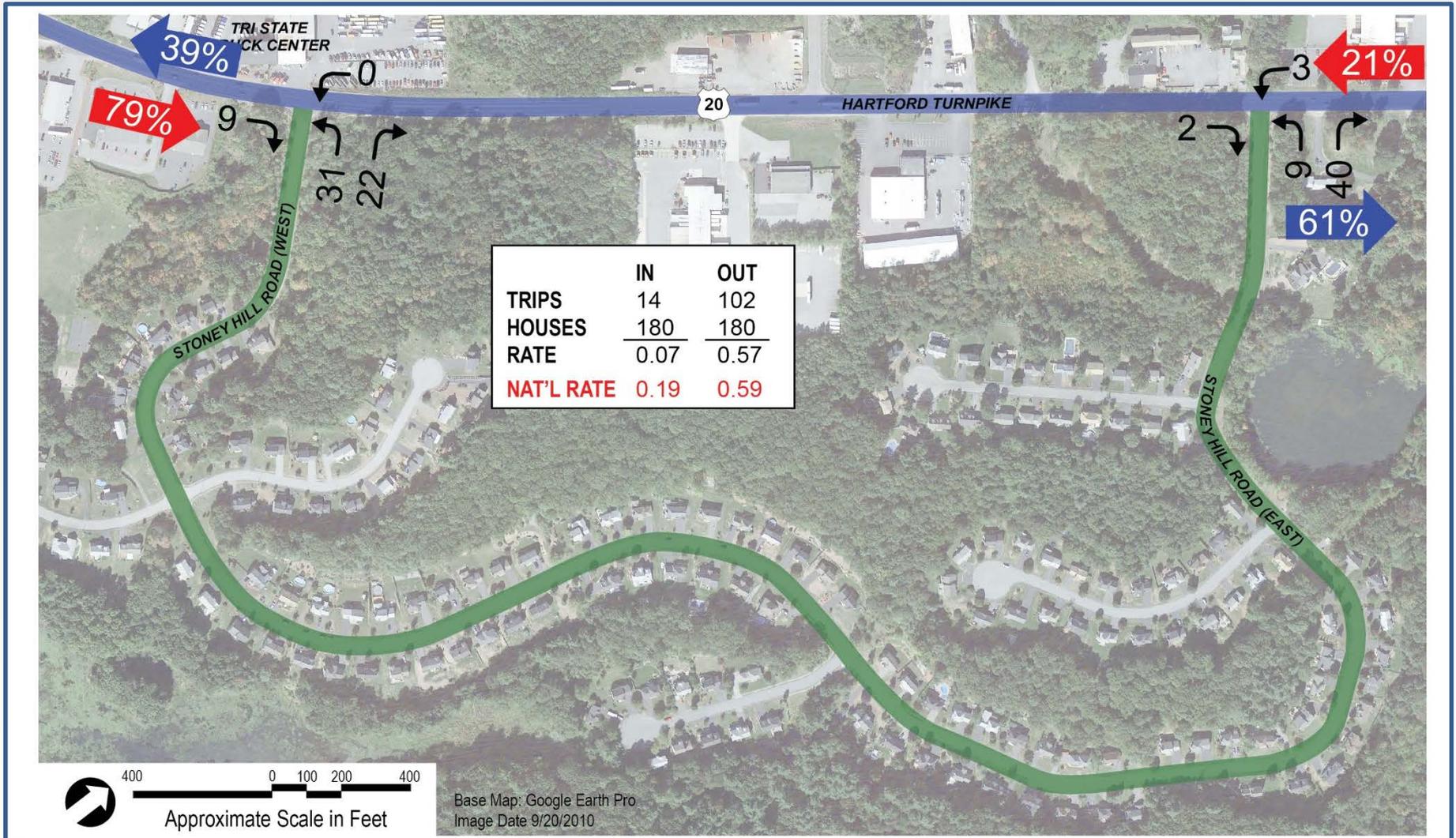
# Existing Roadway Conditions



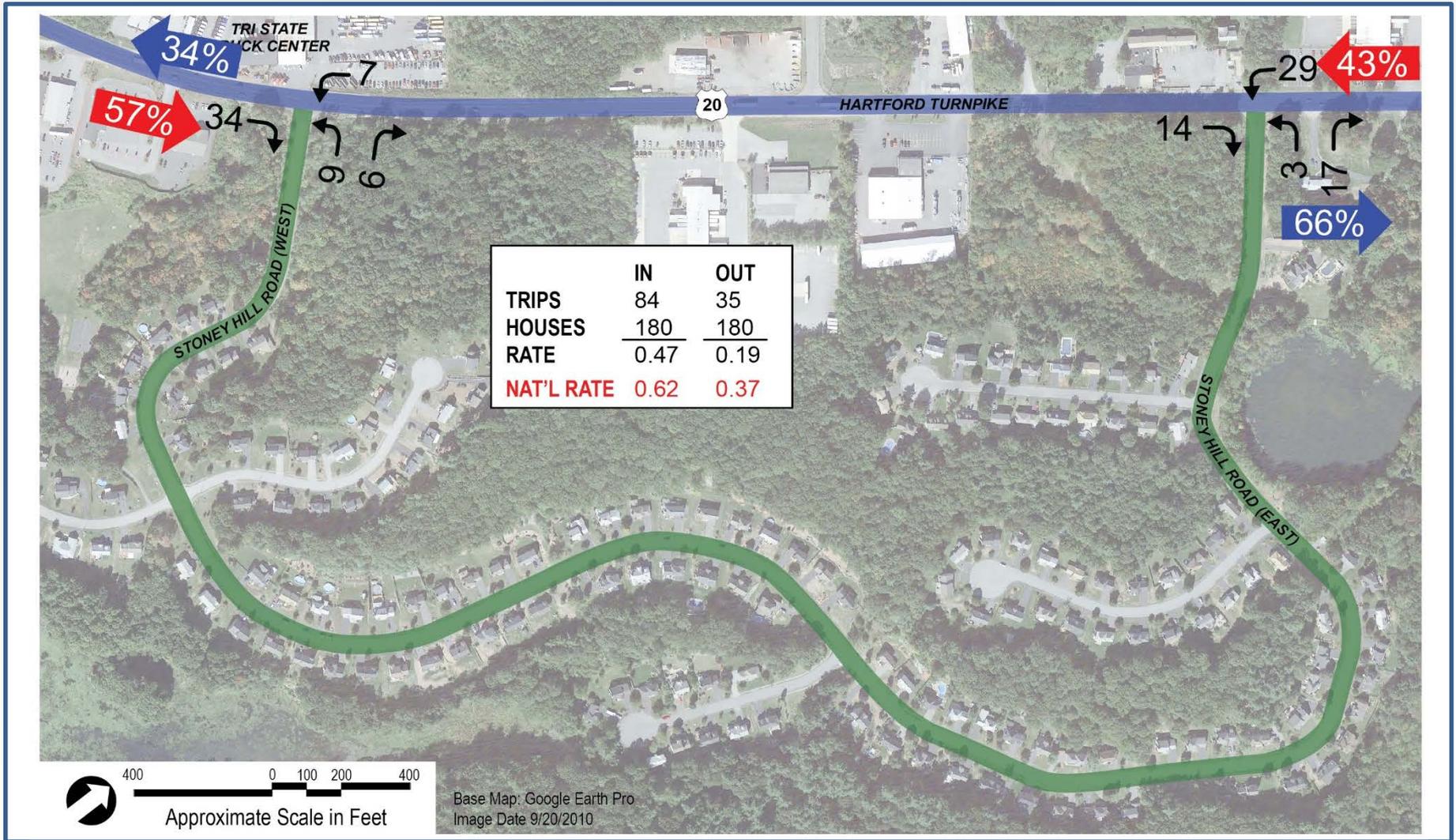
# Existing Traffic Volumes



# Stoney Hill Road Traffic – AM Peak Hour



# Stoney Hill Road – PM Peak Hour



# Stoney Hill Road – West Vehicle Delay and Queuing Study



# Stoney Hill Road – East Vehicle Delay and Queuing Study



# Stoney Hill Road Vehicle Delay and Queuing Study Tuesday, February 24, 2015



# Stoney Hill Road Level of Service

Level of Service	Average Delay per Vehicle (Seconds)
A	≤10.0
B	0.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	>50.0

## West Approach

- 7:30 am to 8:30 am: 28 seconds (LOS D)
- 5:00 pm to 6:00 pm: 10 seconds (LOS A)

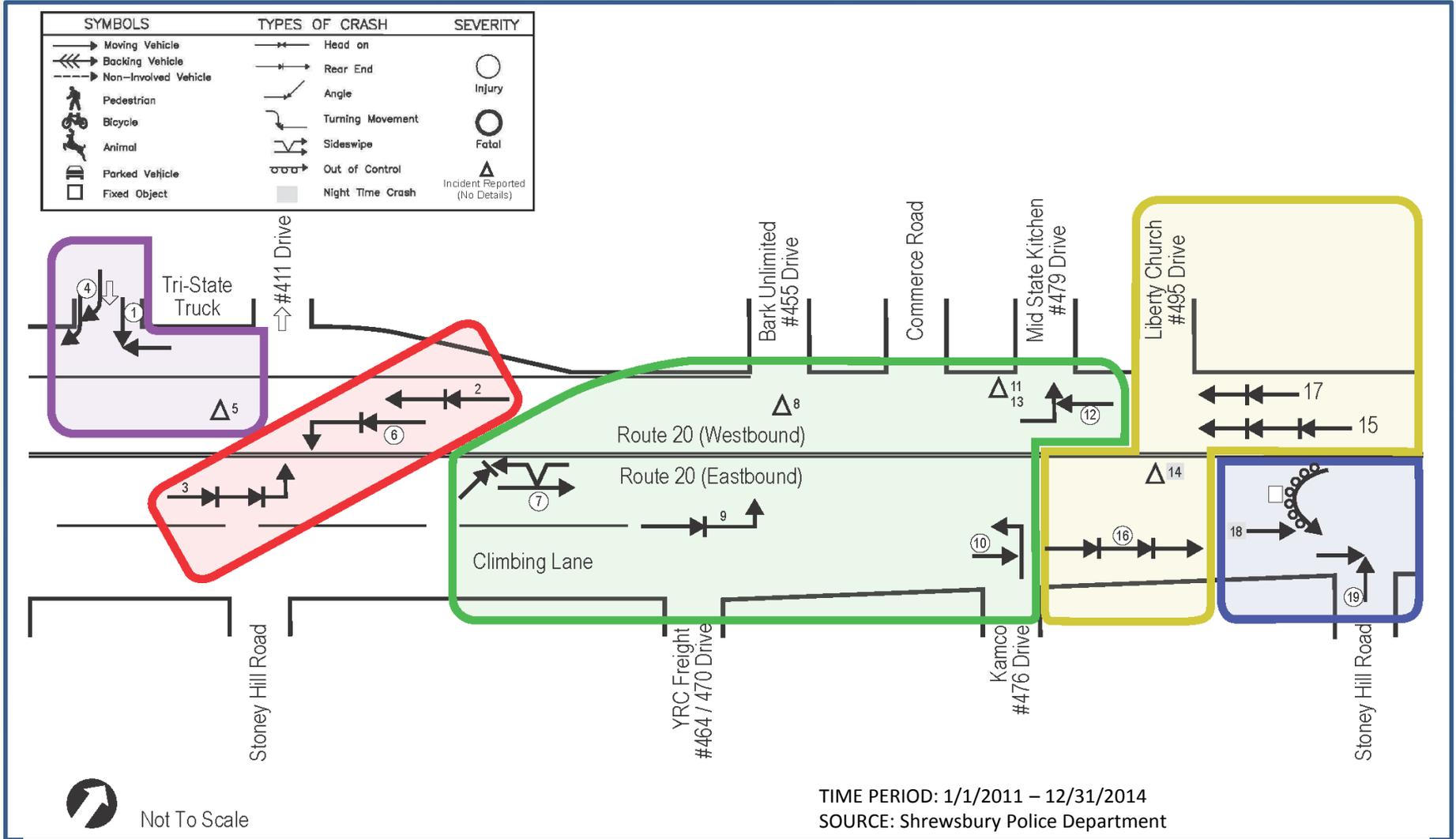
## East Approach

- 7:30 am to 8:30 am: 27 seconds (LOS D)
- 5:00 pm to 6:00 pm: 11 seconds (LOS B)

# Delay Study – Other Observations

- West Approach
  - 7:30 a.m. to 8:30 a.m. **38 minutes no vehicle present**
  - 5:00 p.m. to 6:00 p.m. **58 minutes no vehicle present**
- East Approach
  - 7:30 a.m. to 8:30 a.m. **44 minutes no vehicle present**
  - 5:00 p.m. to 6:00 p.m. **56 minutes no vehicle present**

# Collision Diagram



# Future Volume Projections - 2022

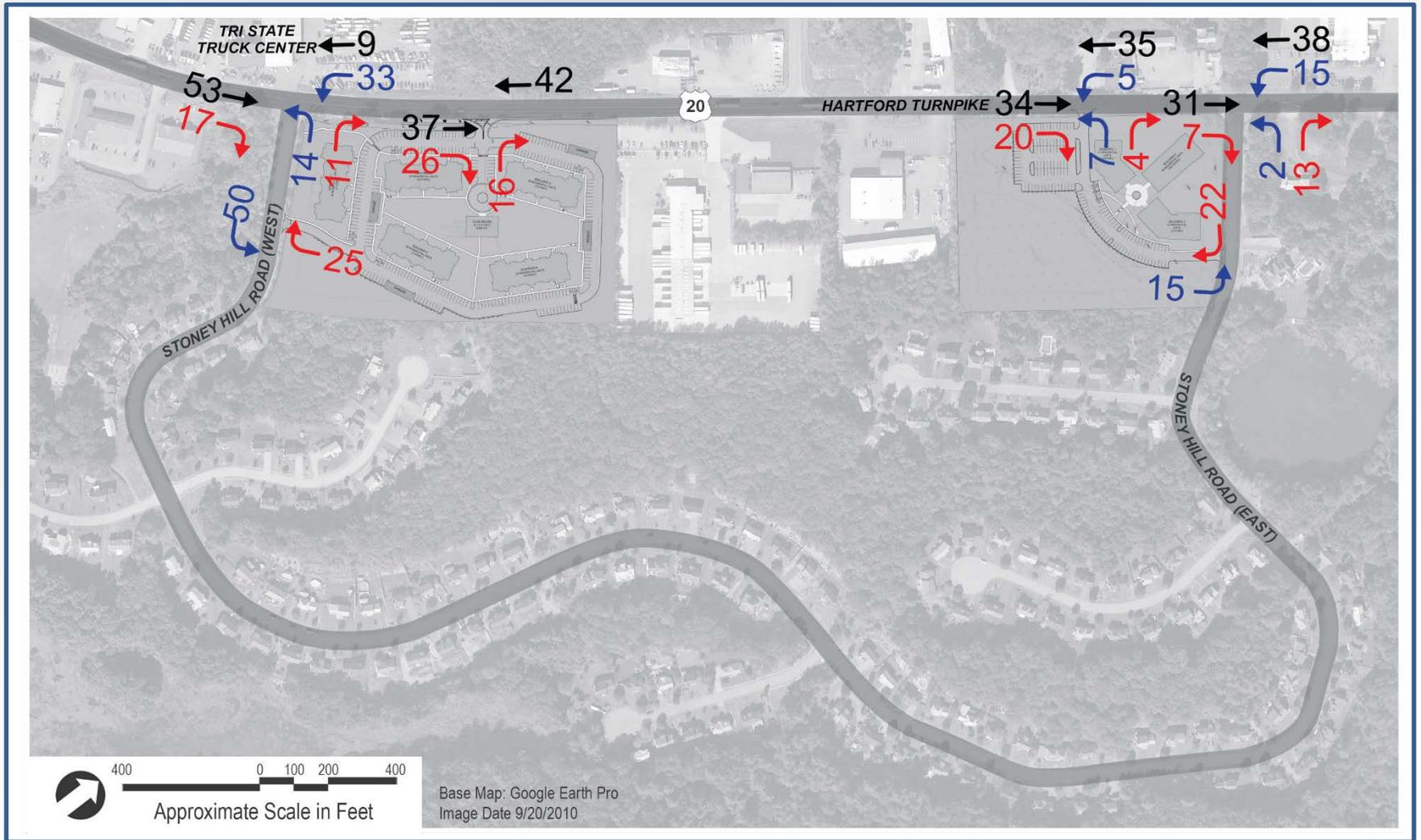
- All traffic increased by 3.5 percent
- Traffic generated by
  - Convenience Store/Gas Station
  - Altec, Inc.
  - Garage Buildings
  - Boston Medical Products

# Project Trip Generation

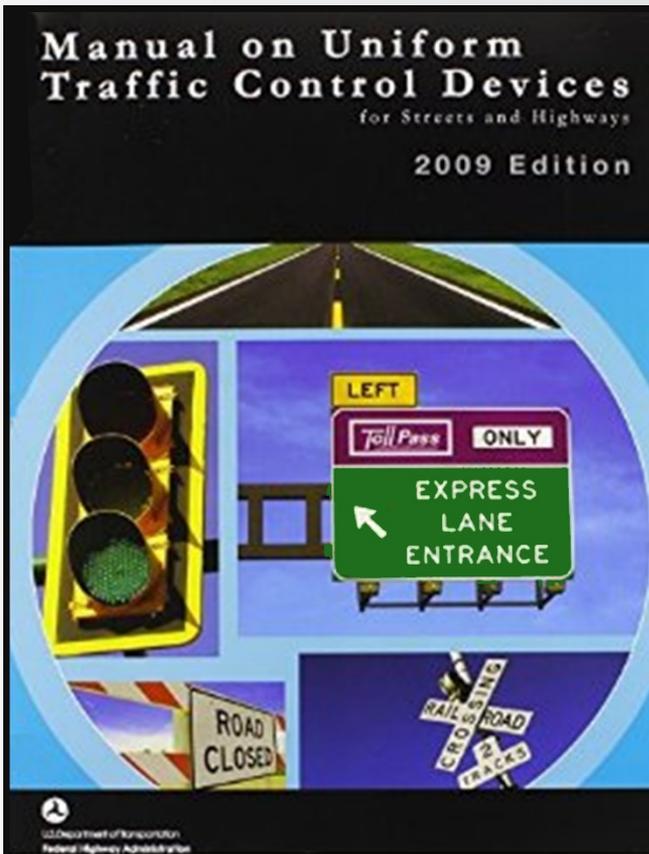
	Phase I – 180 units (Westerly Site)	Phase II – 100 units (Easterly Site)	Total
<b>Weekday Daily</b>	1,214	730	1,944
<b>Morning Peak Hour</b>			
Enter	18	11	29
<u>Exit</u>	<u>74</u>	<u>42</u>	<u>116</u>
Total	92	53	145
<b>Afternoon Peak Hour</b>			
Enter	76	47	123
<u>Exit</u>	<u>41</u>	<u>26</u>	<u>67</u>
Total	117	73	190



# Project Trip PM



# Why Not A Traffic Signal?



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2009 Edition

## CHAPTER 4C. TRAFFIC CONTROL SIGNAL NEEDS STUDIES

### Section 4C.01 Studies and Factors for Justifying Traffic Control Signals

Standard:

- 01 An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.
- 02 The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:

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

- 03 The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

# Why Not A Traffic Signal?

For eight hours over a course of a day, the hourly traffic volume on the major street (both directions), and for the same hour, the traffic volume on the minor street must exceed the criteria listed in the MUTCD.

**Table 4C-1. Warrant 1 Eight-Hour Vehicular Volume**

**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% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>
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	180	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% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>
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

<sup>a</sup> Basic minimum hourly volume

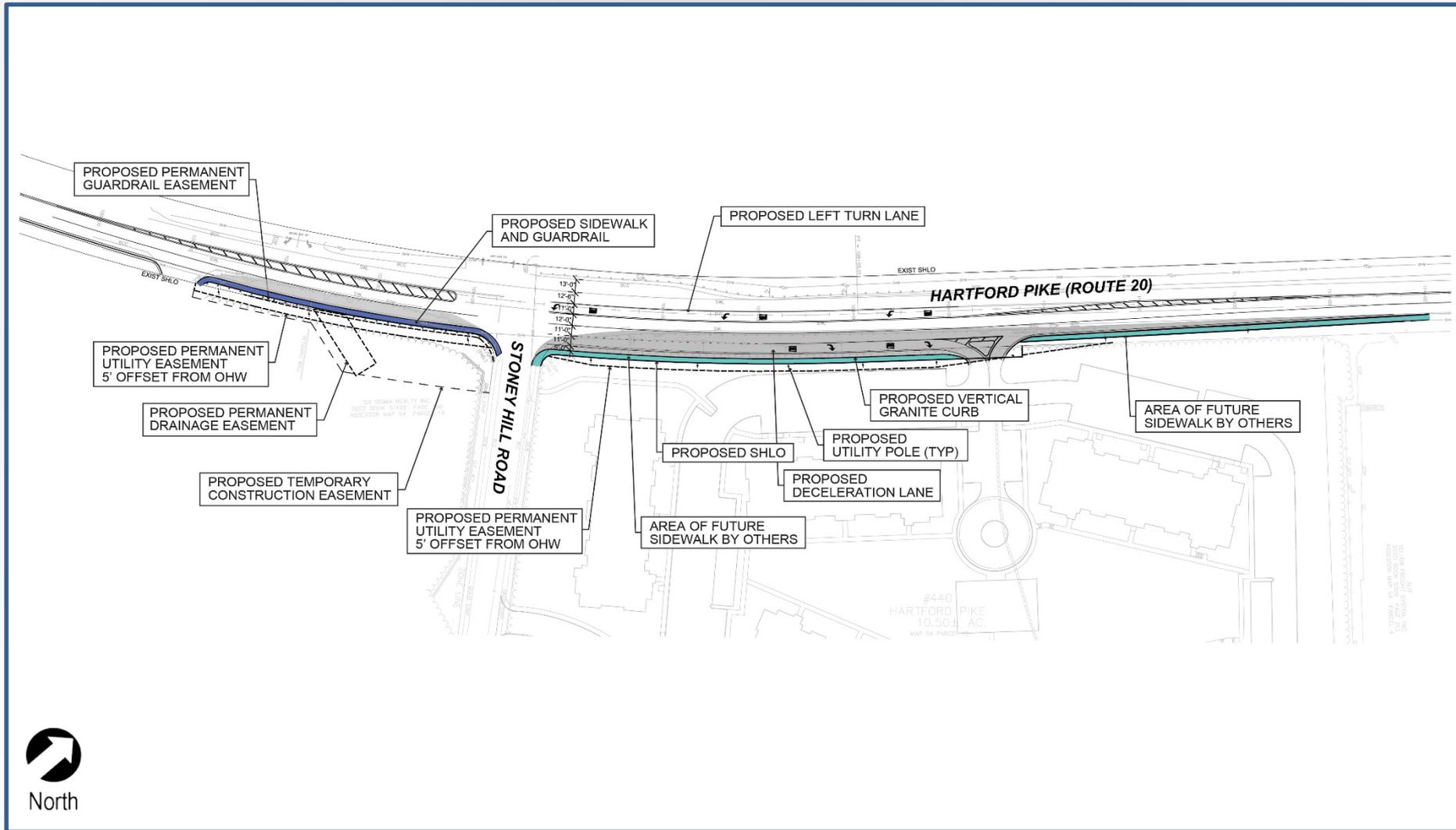
<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

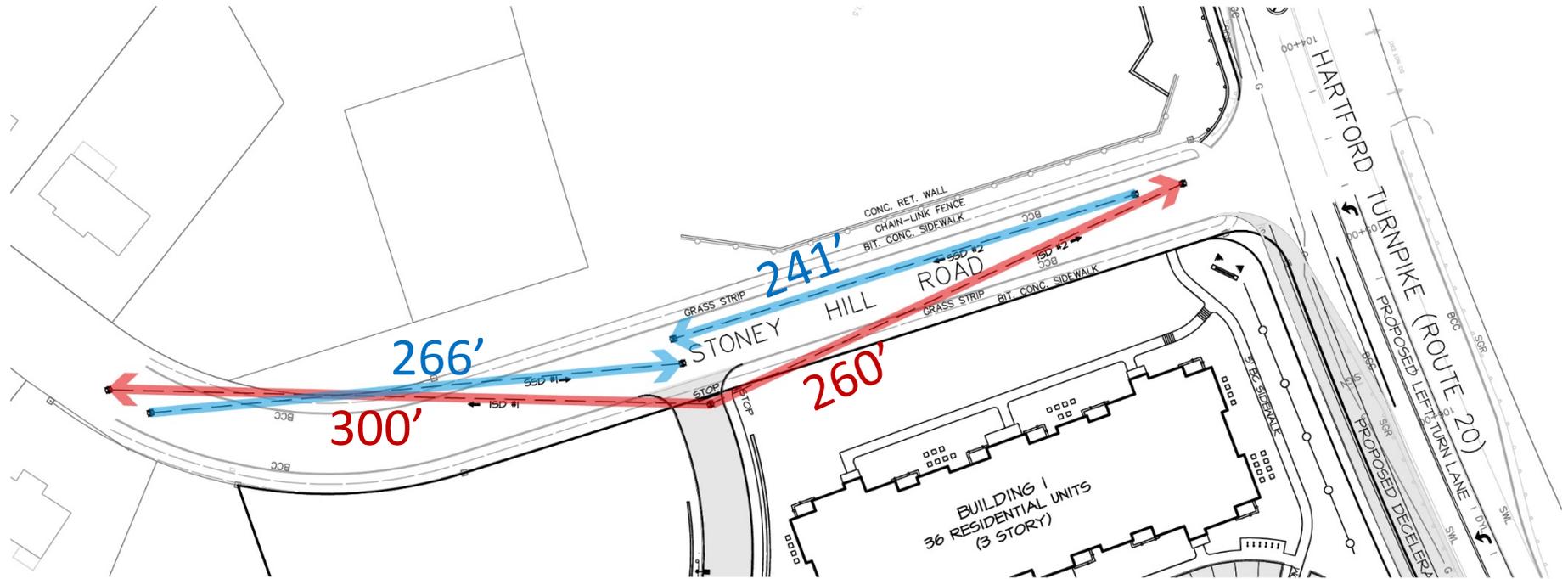
<sup>d</sup> May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

	Rte. 20	Stoney Hill Rd.
Hour	Total	NB
0:00	161	1
1:00	103	0
2:00	93	1
3:00	100	0
4:00	150	3
5:00	528	16
6:00	1301	44
7:00	1859	108
8:00	1752	91
9:00	1333	44
10:00	1245	29
11:00	1253	22
12:00	1342	29
13:00	1319	39
14:00	1472	25
15:00	1698	29
16:00	1815	48
17:00	1955	42
18:00	1502	41
19:00	1061	31
20:00	807	16
21:00	618	6
22:00	401	1
23:00	291	1

# Route 20 – Conceptual Improvements



# Phase I – Sight Lines



Required

Stopping Sight Distance = 216'

Intersection Sight Distance = 216'-364'

Required

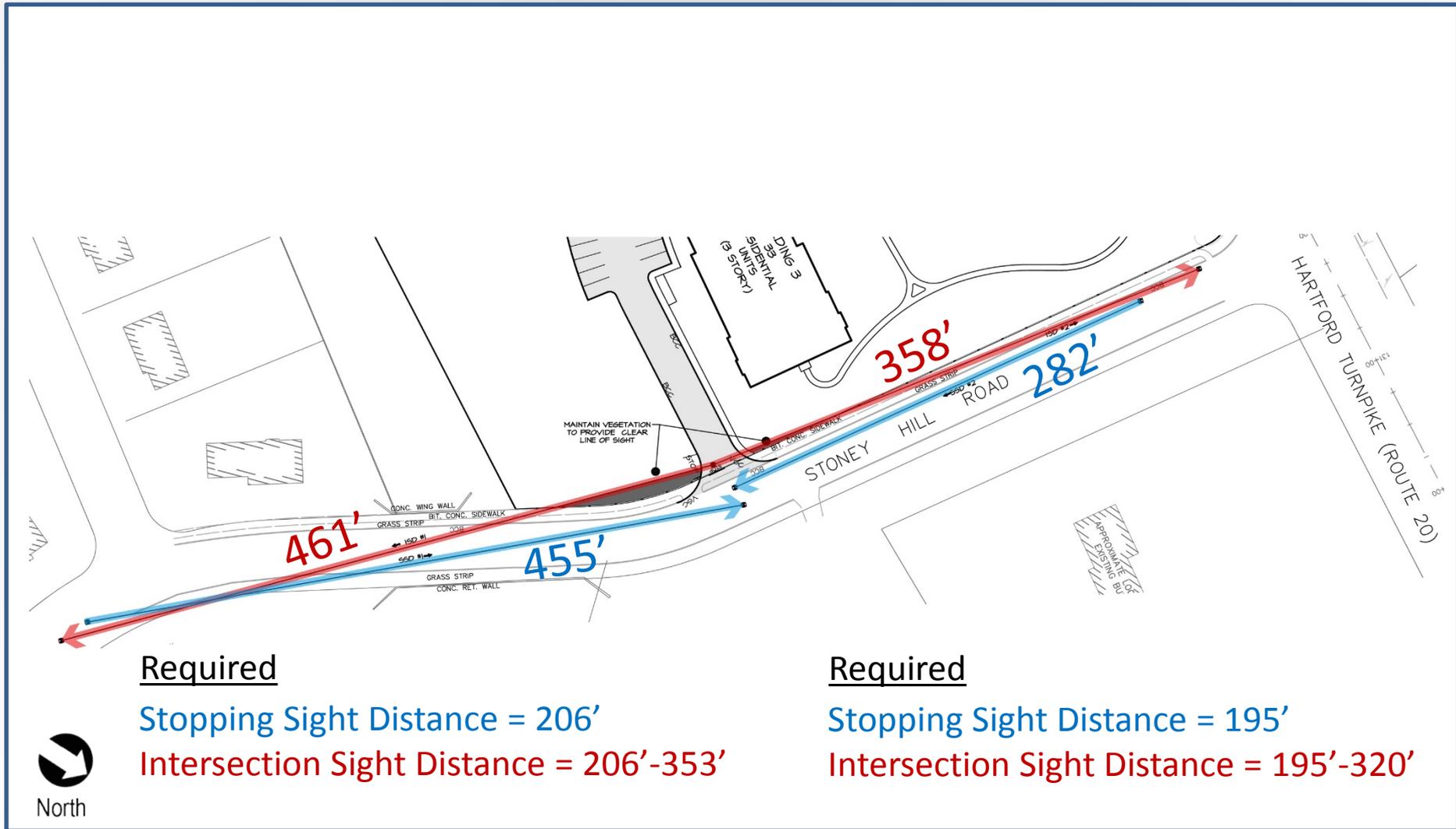
Stopping Sight Distance = 233'

Intersection Sight Distance = 233'-353'



North

# Phase II – Sight Lines



# Transportation Demand Management

- On-Site Amenities
  - Club House
  - Fitness Center
  - Playground
  - Doggie Park
- On-site Transportation Coordinator
- Parking Management
  - Electrical Vehicle Charging Station
- Bicycle Storage
- Public Transit
  - Work with WRTA to provide possible service to Stoney Hill Road