



**COMMUNITY**  
connectivity program

# Norwalk

Connecticut Avenue, Van Buren Avenue, Belden Avenue,  
Cross Street, North Avenue and Westport Avenue.

(Route 1) – Road Safety Audit

June 4, 2018



**AECOM**

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Acknowledgements:

OFFICE OF INTERMODAL PLANNING  
BUREAU OF POLICY AND PLANNING  
CONNECTICUT DEPARTMENT OF TRANSPORTATION

With assistance from AECOM Transportation Planning Group

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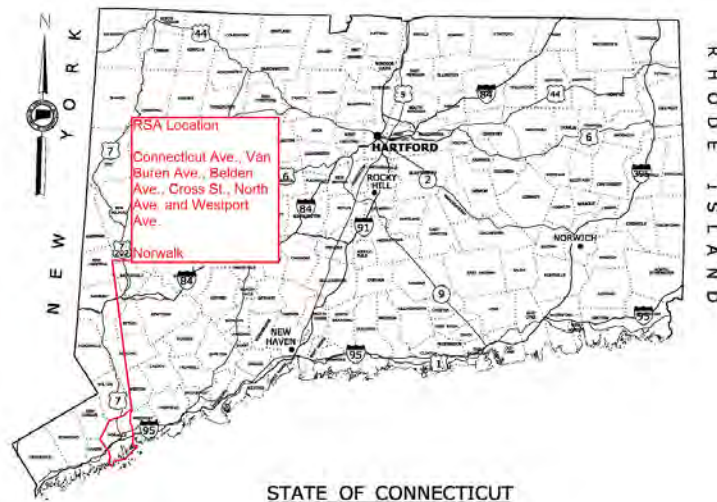




The Connecticut Department of Transportation (CTDOT) is undertaking a Community Connectivity Program that focuses on improving the state's transportation network for all users, with an emphasis on bicyclists and pedestrians. A major component of this program is conducting Road Safety Audits (RSA's) at selected locations. An RSA is a formal safety assessment of the existing conditions of walking and biking routes and is intended to identify the issues that may discourage or prevent walking and bicycling. It is a qualitative review by an independent team experienced in traffic, pedestrian, and bicycle operations and design that considers the safety of all road users and proactively assesses mitigation measures to improve the safe operation of the facility by reducing the potential crash risk frequency or severity.

The RSA team is made up of CTDOT staff, municipal officials and staff, enforcement agents, AECOM staff, and community leaders. An RSA Team is established for each municipality based on the requirements of the individual location. They assess and review factors that can promote or obstruct safe walking and bicycling routes. These factors include traffic volumes and speeds, topography, presence or absence of bicycle lanes or sidewalks, and social influences.

Each RSA was conducted using RSA protocols published by the FHWA. For details on this program, please refer to [www.ctconnectivity.com](http://www.ctconnectivity.com). Prior to the site visit, area topography and land use characteristics are examined using available mapping and imagery. Potential sight distance issues, sidewalk locations, on-street and off-street parking, and bicycle facilities are also investigated using available resources. The site visit includes a "Pre-Audit" meeting, the "Field Audit" itself, and a "Post-Audit" meeting to discuss the field observations and formulate recommendations. This procedure is discussed in the following sections.



# 1 Introduction to Connecticut Avenue, Van Buren Avenue, Belden Avenue, Cross Street, North Avenue and Westport Avenue Norwalk RSA

The Connecticut Department of Transportation (CTDOT) is undertaking an RSA along the U.S. Route 1 corridor between the New York State line and the Westport/Fairfield border, a total distance of 22.77 miles. This corridor encompasses five municipalities: Greenwich, Stamford, Darien, Norwalk, and Westport. Because of the length of the corridor, and the differing stakeholders in the various municipalities, it was decided to treat each town as an individual RSA corridor. This report presents the findings of the RSA conducted in the City of Norwalk.

The City of Norwalk corridor includes US Route 1 (Connecticut Avenue, Van Buren Avenue, Belden Avenue, Cross Street, North Avenue and Westport Avenue) from Darien to the Westport border, a distance of 5.11 miles. The study corridor generally has sidewalks on at least one side of the street throughout the project limits, but eliminating any sporadic gaps would improve safety for pedestrians and bicyclists, and the improved connectivity would create and expand the vibrant use of the corridor.

## 1.1 Location

The RSA corridor includes Connecticut Avenue, Van Buren Avenue, Belden Avenue, Cross Street, North Avenue, and Westport Avenue (Figure 1). Figure 2 shows the study area in a regional context. Route 1 is classified as a principal arterial and runs parallel with Interstate 95. The Average Daily Traffic (ADT) on Route 1 is as follows:

- Connecticut Avenue 15,900-29,400 vehicles per day (vpd)
- Van Buren Avenue 14,700-16,600 vpd
- Belden Avenue 13,500-16,500 vpd
- Cross Street 12,600-15,900 vpd
- North Avenue 14,400 vpd
- Westport Avenue 19,300 – 23,100 vpd

These are considered moderate to high volumes for suburban/urban roadways. A majority of the corridor has two lanes in each direction. All major intersections throughout the study area are controlled by traffic signals.

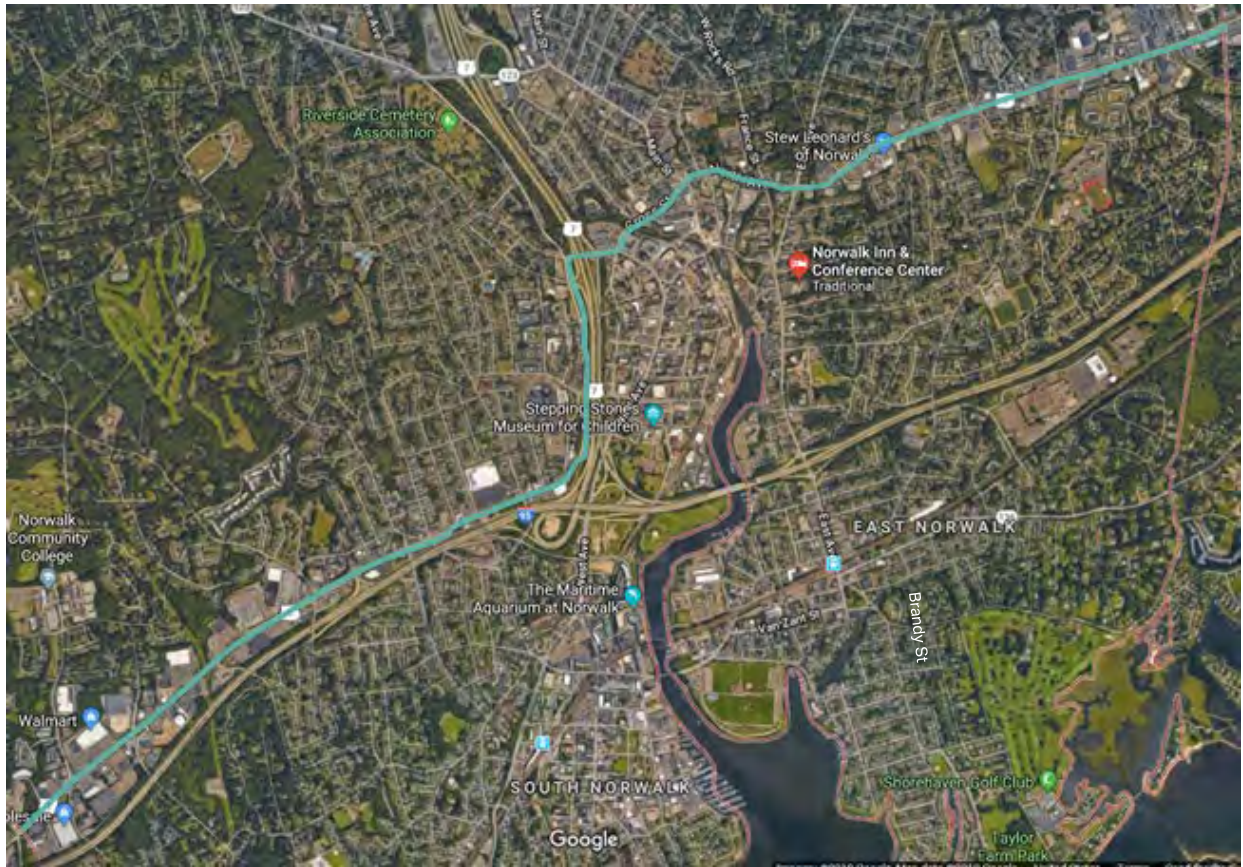


Figure 1, Connecticut Avenue, Van Buren Avenue, Belden Avenue, Cross Street, North Avenue and Westport Avenue (Route 1) Norwalk



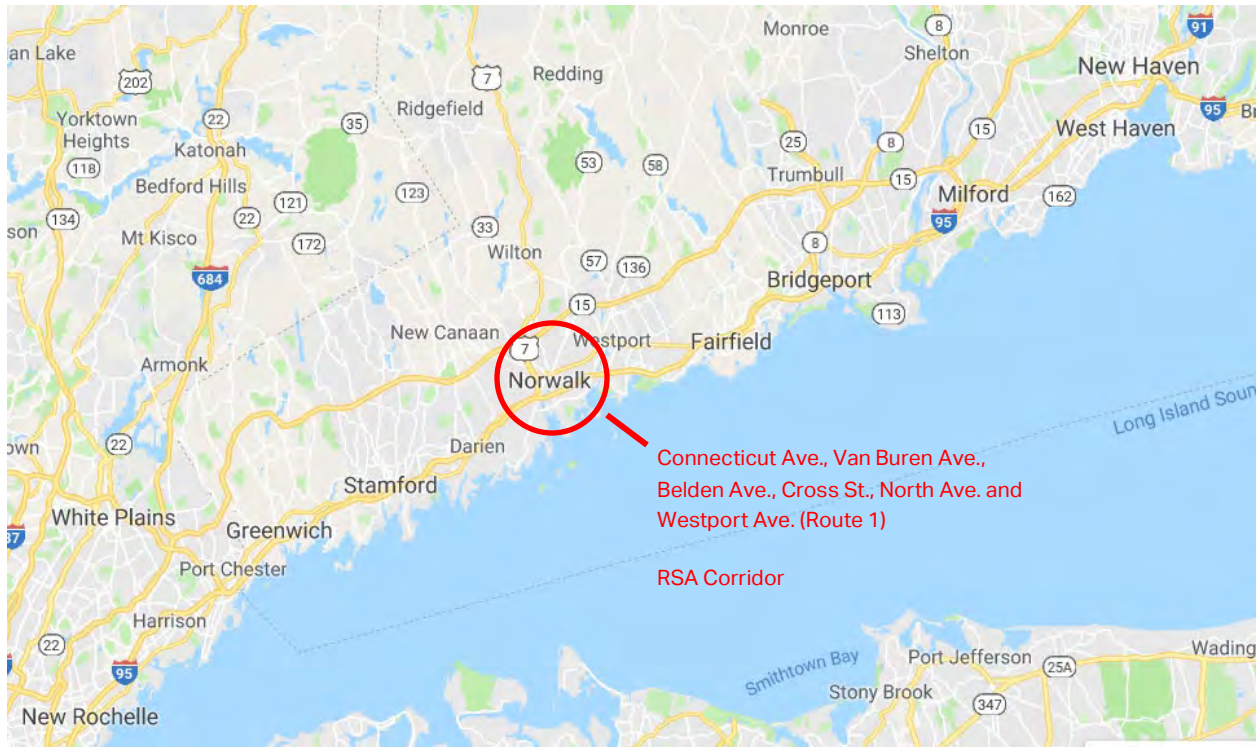


Figure 2. Study Area – Regional Context

## 2 Pre-audit Assessment

### 2.1 Pre-audit Information

As noted above, traffic volumes are moderate to high along this urbanized corridor. Between 2015 and 2017 there were 986 crashes throughout the RSA corridor. Nearly half of these collisions were front to rear (rear-end) collisions, and over 75% were either angle, sideswipe same direction, or front to rear (rear-end) collisions. This is a strong indication of the nature of the operation in the corridor being substantially influenced by the high number of intersections and driveways, and by significant levels of traffic congestion.

Severity Type	Number of Crashes	
Property Damage Only	801	81%
Injury of any type (Serious, Minor, Possible)	183	19%
Fatal (Kill)	2	0%
<b>Total</b>	<b>986</b>	

Table 1. Crash Severity 2015-2017

Source: UConn Connecticut Crash Data Repository

Manner of Crash / Collision Impact	Number of Crashes	
Front to rear	443	45%
Rear to side	13	1%
Sideswipe, opposite direction	11	1%
Not Applicable	46	5%
Angle	181	18%
Other	55	6%
Sideswipe, same direction	133	13%
Unknown	79	8%
Rear to rear	9	1%
Front to front	16	2%
<b>Total</b>	<b>986</b>	

Table 2. Crash Type 2015-2017

Table 1 and Table 2 provide additional information on the type of collision as well as the severity of the crash. While the great majority of crashes (81%) resulted only in property damage, injuries resulted in 19%, and two crashes, one of which involved pedestrians, resulted in fatalities.

Figure 3 and Figure 4 display crashes that occurred in this area between 2015 and 2017. Crashes are dispersed throughout the RSA corridor with clusters around intersections.

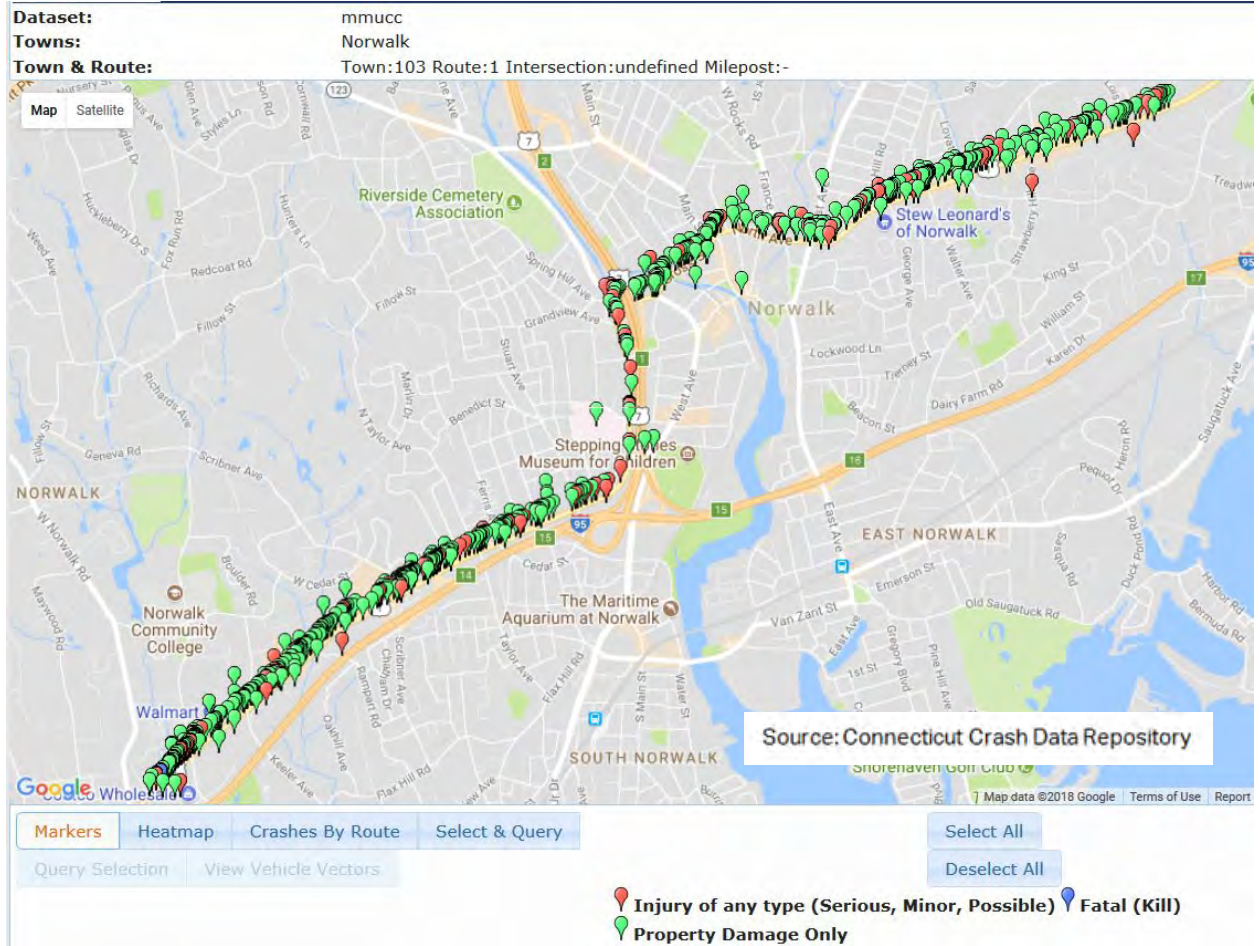


Figure 3. Crashes that Occurred in 2015 (Connecticut Crash Data Repository)



Dataset: mmucc  
 Towns: Norwalk  
 Town & Route: Town:103 Route:1 Intersection:undefined Milepost:-

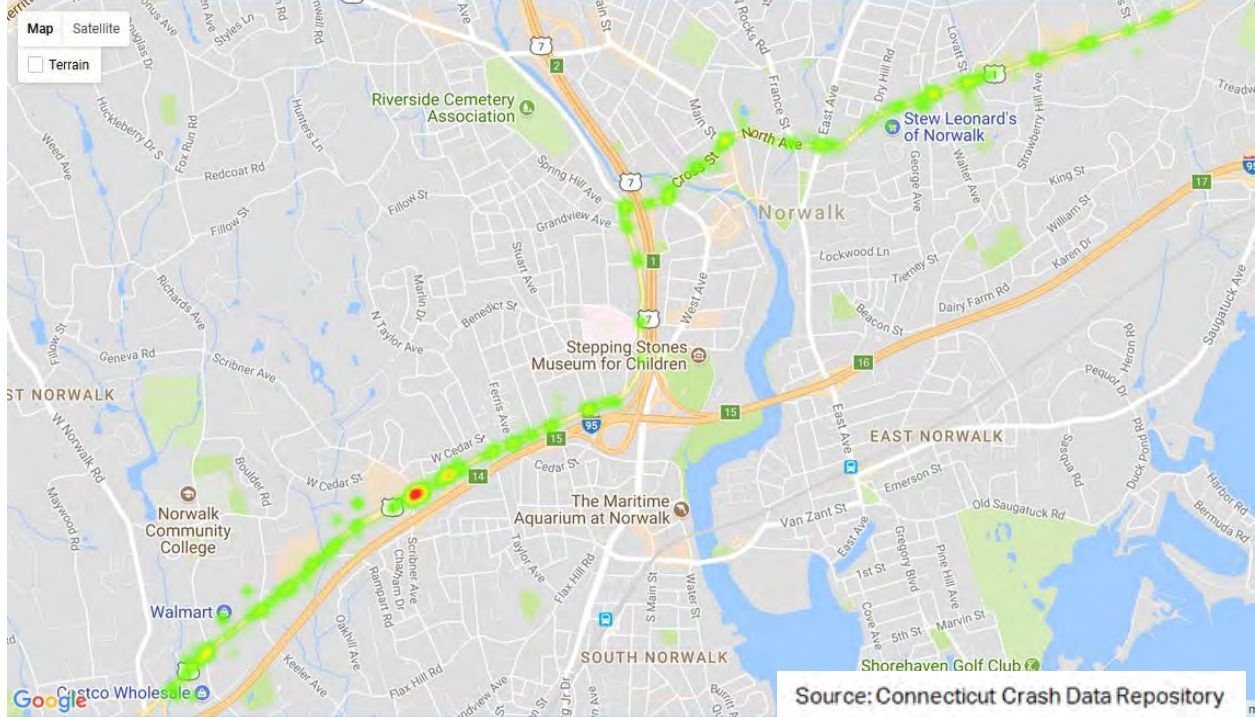


Figure 4. Crash Data Heat Map (2015-2017)

There are 37 signalized intersections within the study corridor. Many of these are closely spaced. In addition, there are many driveways to private businesses, including older sites with large curb cuts or parking adjacent to the roadway. Norwalk Transit and CT Transit bus stops are also located throughout the corridor.

During the Pre-audit meeting, the RSA team decided to focus on several key areas because of the length of the corridor. The focus areas are:

- Connecticut Avenue at Richards Avenue
- Connecticut Avenue at Keeler Avenue
- Connecticut Avenue at Scribner Avenue
- Belden Avenue from Van Buren Avenue to Cross Street
- Cross Street at Main Street
- North Avenue from France Street to East Avenue (Future state project 102-325)

Roadway geometrics for study corridor roadways and intersections are shown in Figure 5, Figure 6, Figure 7 and Figure 8. An inventory of existing conditions of the intersections can be found in Table 3.





Figure 5. Connecticut Avenue, Norwalk Route 1 - Road Geometrics



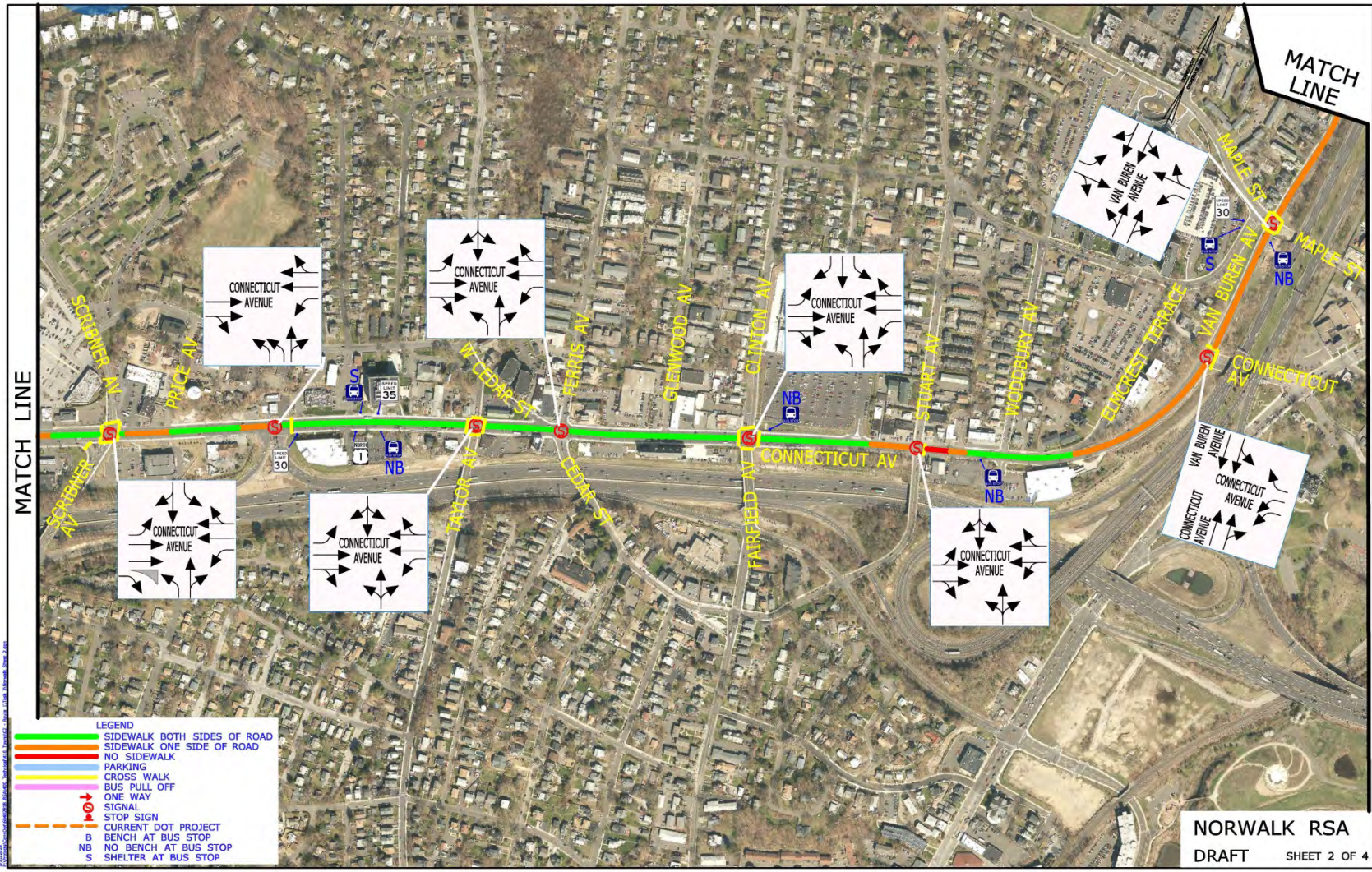


Figure 6. Connecticut Avenue and Van Buren Avenue, Norwalk Route 1 – Road Geometrics



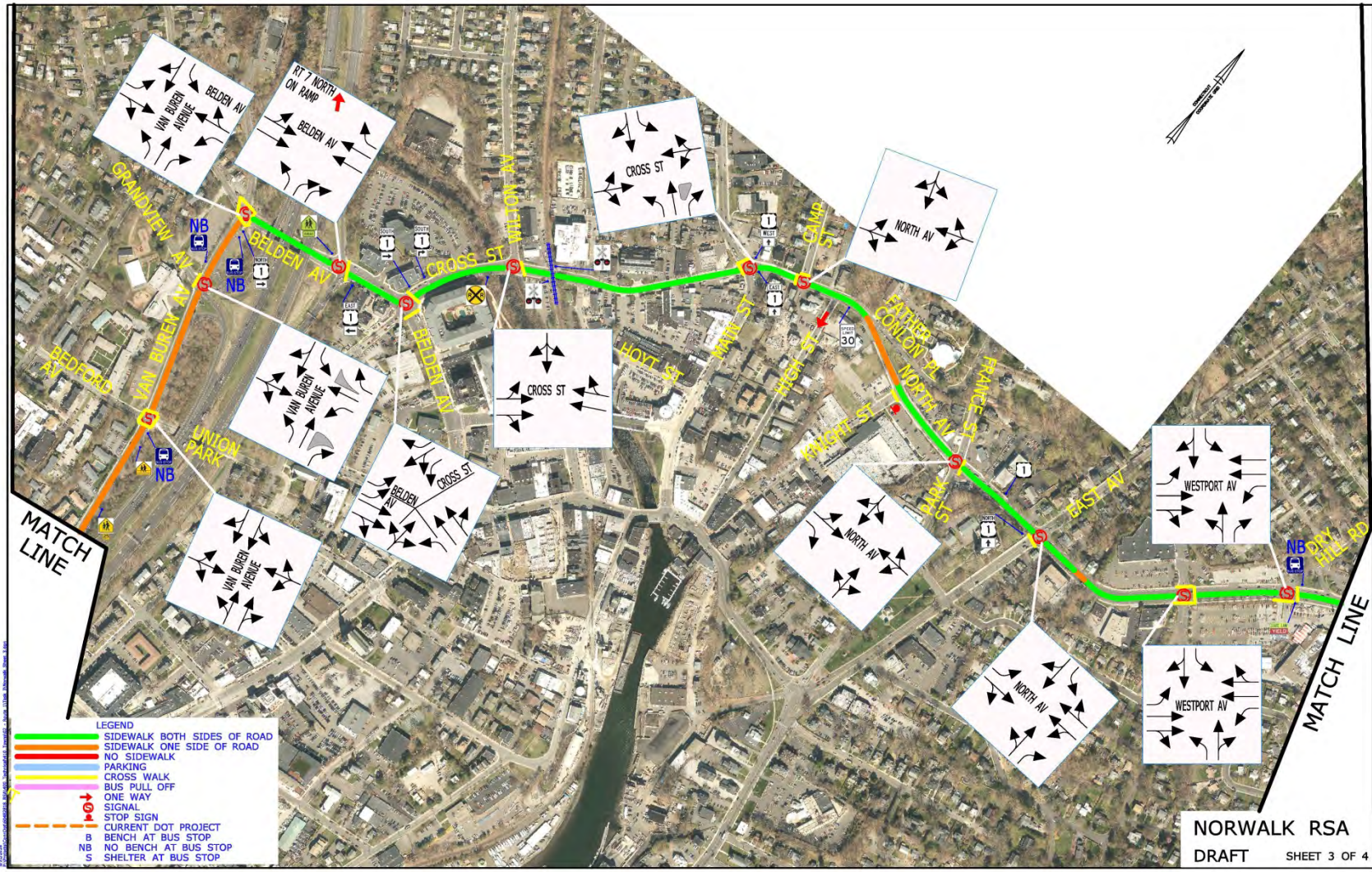


Figure 7. Van Buren Av., Belden Av., Cross St., and North Av., Norwalk Route 1 - Road Geometrics





Figure 8. Westport Av., Norwalk Route 1 - Road Geometry



## Norwalk RSA

### Street Inventory

From	To	Length	Lanes (Width)	Side	Sidewalk			Curb	Parking	Shoulder	Ramps	
					Type	Width	Condition				Exist	Compliant
W Norwalk Rd	Richards Ave	1682 ft	2 (12')	EB	Concrete	5'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
Richards Ave	Keeler Ave	1370 ft	2 (11')	EB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	5'	Fair	Concrete	No	Varies	Yes	No
Keeler Ave	Rampart Rd	1830 ft	2 (12')	EB	None	N/A	N/A	Concrete	No	Varies	No	No
				WB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
Rampart Rd	Scribner Ave	2005 ft	2 (11')	EB	Concrete	8'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
Scribner Ave	Taylor Ave	1743 ft	2 (12')	EB	Concrete	8'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	8'	Fair	Concrete	No	Varies	Yes	No
Taylor Ave	Elmcrest Terrace	2504 ft	2 (12')	EB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	8'	Fair	Concrete	No	Varies	Yes	No
Elmcrest Terrace	Bedford Ave	2760 ft	2 (11')	EB	None	N/A	N/A	Concrete	No	Varies	Yes	No
				WB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
Bedford Ave	Spring Hill Ave	1078 ft	2 (11')	EB	None	N/A	N/A	Concrete	No	Varies	Yes	No
				WB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
Spring Hill Ave	Wilton Ave	1450 ft	2 (11')	EB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
Wilton Ave	High St	1570 ft	1 (13')	EB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	5'	Fair	Concrete	No	Varies	Yes	No
High St	East Ave	1520 ft	1 (12')	EB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
East Ave	Lufberry Lane	2386 ft	2 (11')	EB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
Lufberry Lane	Strawberry Hill Ave	2342 ft	2 (11')	EB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	7'	Fair	Concrete	No	Varies	Yes	No
Strawberry Hill Ave	Lois St	1950 ft	2 (12')	EB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
				WB	Concrete	8'	Fair	Concrete	No	Varies	Yes	No
Lois St	Hills Lane	970 ft	2 (12')	EB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
				WB	None	N/A	N/A	Concrete	No	Varies	Yes	No

Table 3. Street Inventory

## 2.2 Prior Successful Effort

The City of Norwalk has had some bike and pedestrian related studies and programs aimed at improving this corridor. Yellow and red-signal clearance timing was evaluated. Some schools have active Safe Routes to School Programs to encourage kids to safely walk and bike to school. In addition, WestCOG has conducted a Bus Rapid Transit study for transit counts. The City is also looking at consolidating driveways through corridor access management.

## 2.3 Pre-Audit Meeting

The RSA was conducted on June 4, 2018. The Pre-Audit meeting was held at 8:30 AM in the City Hall located at 125 East Avenue, Norwalk CT.

The RSA Team was comprised of staff from AECOM, staff from CTDOT, representatives from Norwalk departments that include the Police, Planning and Zoning, and Public Works, as well as the UConn Transfer Center and a representative from the Connecticut State Bicycle and Pedestrian Advisory Board. The complete list of attendees can be found in Appendix B.

Several items were presented for general information prior to conducting the Audit in the field:

- There are two transit systems serving Norwalk along this corridor, CT Transit and Norwalk Transit.
  - There are no bus passenger amenities, no benches or shelters.
  - There are a few bus pull off areas.
  - There are no crosswalks at the bus stops.
- Pedestrian safety along this corridor is a concern for the City.
  - There are several pedestrian crash hot spots:
    - Keeler Avenue and US-1
    - Scribner Avenue and US-1 fatal pedestrian crash
  - Half of pedestrian signal heads use LED lighting.
- Bicyclists safety:
  - This is not a high commuter cyclist route.
  - Not considered a bike friendly roadway.
  - The City has an ordinance prohibiting bikes on sidewalk.
- Schools located on the corridor:
  - Community College
  - Jefferson Elementary School
    - Arrival and Departure patterns have improved.
  - There are Safe Routes to School Programs in some schools.
- Other City concerns:
  - High traffic along corridor all day.
  - Choke point along US-1 from Belden Avenue to East Avenue-project to improve mobility.

- Signal timing issue on US-1-needs to be reviewed along the segment of the corridor west of the I-95 ramps.
- The intersection of US-1 and Scribner Avenue is a concern.
  - There is an exclusive pedestrian phase.
  - The signal has a double cycle and this causes queuing and delay.
  - New retail establishments have added to the concern.
- Signal optimization on Connecticut Avenue (US-1) is not an issue in the morning because retail stores are not open.
- US-1 east of CT-7 is under construction.
- Two signals are under a CMAQ project.
- Zoning wants more pedestrian friendly and bucolic US-1 as developers move in
- Traffic near Lowes is heavy on Saturdays and Sundays.
- City encourages access management but does not mandate it. They would like to consolidate driveways.
- Seatbelt compliance is high.
- Cell phone violations while driving are high.
- Just over 29,000 ADT at the western end.
- Roughly 15,000 ADT around the Route 7/95 exchange.
- ADT ranges from 19,000 to 23,000 on the east end of the corridor.
- Notable crashes along corridor:
  - Fatal #1 car crash was a car on car crash that occurred just west of Costco resulting in driver and passenger fatalities.
  - Fatal # 2 car crash was car on pedestrian at the intersection of Bedford Avenue and Route 1. It was dark/not lighted and the fatality was the pedestrian.
- The BRT study from WestCOG had transit counts at the bust stop.
- Sidewalks are not being cleared in the winter from snow.
- Norwalk River Valley Trail runs parallel to US-1 and possibly transects it
- Key locations:
  - 95 off ramps –signal timing
  - Scribner Avenue

### 3 RSA Assessment

#### 3.1 Field Audit Observations

##### US-1 and Richards Avenue

- Skewed signalized four-way intersection.
- No crosswalks or ADA handicap ramps.
- There is an exclusive pedestrian phase with pushbuttons located in the NW and SE corners.

- The diagonal crossing measured 80 feet and the pedestrian signal permitted 25 seconds which is adequate for pedestrian clearance time.
- Wide intersection.
- Intermittent sidewalks. (no sidewalk along Bowling Alley frontage on south side of Route 1)
- Driveways at gas station on northwest corner are very close to signalized intersection.
- Grassy median on southern leg of Richards Avenue and US-1.
- Channelized right turn lane for US-1 eastbound and Richards Avenue.
- Stop bar on southbound Richards Avenue at US-1 is set behind gas station driveway (Figure 9).
- No sidewalk for far side bus stop, eastbound.



Figure 9. Gas Station Driveway in Intersection

### **US-1 and Keeler Avenue**

- Skewed signalized four-way intersection.
- Long crossing (125 feet) across north leg of Keeler Avenue.
- Sidestreet green activated by push buttons in the NW and SW corners.
- Eastern leg across US-1 does not have painted crosswalk.



Figure 10. Faded Crosswalk

### **US-1 and Rampart Road**

- This is a four-way signalized intersection.
- US-1 measures 68 feet across.
- Sidestreet green activated by push buttons in the NE and SE corners.
- The crosswalks are faded (Route 1 has been repaved & restriped since audit) (Figure 10)
- The southbound US-1 *signal ahead* sign is blocked by vegetation (Figure 11).
- The intersection warning sign for the signal at the entrance to the Starbucks (900 ft. south of Rampart Road) is blocked by vegetation.



Figure 11. Sign Blocked by Vegetation

### **US-1 and Scribner Avenue**

- Four-way signalized intersection with retroreflective backplates.

- Sight distance is limited at this intersection.
- This is a high crash location.
- Channelized island along southwest corner for right-turning motorists heading south on Scribner Avenue, from US-1.
- I-95 NB on-ramp located on Scribner Avenue just south of US-1-contribute to volume of traffic.
- There is a left turn bay to enter CVS on Scribner Avenue south of US-1. This is a difficult maneuver for motorists coming from US-1 to change over three lanes in short distance to enter the CVS driveway.
- There are countdown pedestrian signals at intersection.
- Scribner Avenue is 48 feet wide on the southern leg and 54 feet wide on the northern leg.
- US-1 measures 68 feet wide on the western leg and 78 feet wide on the eastern leg.
- Sidewalk ramps are ProWAG compliant, not ADA compliant -the grade is steep at this location.
- The sidewalks were recently redone and crosswalks painted (Figure 12).



Figure 12. US-1 and Scribner Ave. Intersection

### **US-1 and Belden Avenue**

- This is a four-way signalized intersection.
- Missing sidewalk on eastern side of US-1.

### **US-1 and Stew Leonard's and Dry Hill Road**

- This is a four-way signalized intersection.
- Signal head controlling Dry Hill Road traffic is blocked by power lines (Figure 13).
- There are crosswalks on the southern side and east leg of the intersection.
- The crosswalks are faded
- The crosswalk crossing Stew Leonard's Driveway along US-1 is 85 feet long.
- The US-1 crossing is 58 feet long.
- There is a Stew Leonard's employee parking lot in NW corner that has no crosswalk and pushbuttons to cross west leg of Route 1 to the store.



Figure 13. Signal Heads Blocked by Powerline

### **US-1 and George Avenue**



- This is a four-way signalized intersection.
- US-1 measures 58 feet wide and George Avenue is 29 feet wide.
- There are pedestrian signals and pushbuttons on the east leg, crossing US-1.
- Senior housing on the corner is a consideration for pedestrian signal timing.
- There is pooling along bituminous asphalt sidewalk in front of the Senior Housing along US-1 indicating a possible drainage issue.
- The crest along George Avenue approaching US-1 impedes sight distance. A possible signal ahead warning sign could be installed.
- There is a Stew Leonard's parking lot in NW corner that has no crosswalk and pushbuttons to cross west leg of Route 1.



Figure 14. Pooling on Sidewalk

### 3.2 Post Audit Workshop - Key Issues

- US-1 and Richard Avenue
  - No marked crosswalks
  - Midterm – replace signal and add crosswalk
  - Add channelizing right-turn island on the east leg
  - Investigate curb cut management
  - Way finding signage
  - LED lighting
  - Bus Stop
- US-1 and Scribner Avenue
  - Short term - address double cycling issue when pedestrian phase called
  - Short term - prohibit quick right and left into parking lot heading east
- US-1 and Dry Hill Road
  - Short term - trim trees to see signal
  - Midterm – install crosswalk on west side of intersection

## 4 Recommendations

From the discussions during the Post-Audit meeting, the RSA team compiled a set of recommendations that are divided into short-term, mid-term, and long-term categories. For the purposes of the RSA, **Short-term** is understood to mean modifications that can be expected to be completed very quickly, perhaps within six months, and certainly in less than a year if funding is available. These include relatively low-cost alternatives, such as striping and signing, and items that do not require additional study, design, or investigation (such as right-of way acquisition). **Mid-term** recommendations may be more costly and require establishment of a funding source, or they may need some additional study or design in order to be accomplished. Nonetheless, they are relatively quick turn-around items, and should not require significant lengths of time before they can be implemented. Generally, they should be completed within a window of eighteen months to two years if funding is available. **Long-term** improvements are those that require substantial study and engineering, and may require significant funding mechanisms and/or right-of-way acquisition. These projects generally fall into a horizon of two or more years when funding is available.

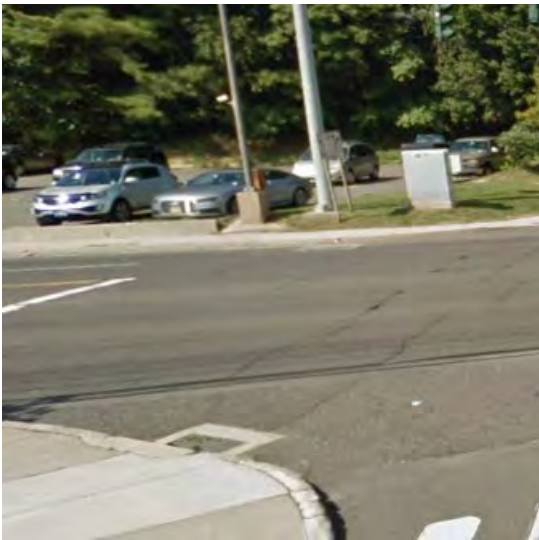
### 4.1 Short Term

1. Inventory the condition, functionality and ADA compliance of all pedestrian push buttons.
2. Add wayfinding signs at US-1 and Richards Avenue.
3. Add cat tracks through US-1 and Richards Avenue intersection to improve visual cues for motorists (Figure 15).
4. Prohibit left turns into the gas station on US-1 at Richards Avenue.
5. Add a no Turn on Red Sign on Richards Avenue and US-1 (Figure 16).
6. Conduct Turning Movement counts at Richards Avenue and US-1.
7. Move the stop bar ahead at US-1 and Richards Avenue.
8. Install No Turn on Red sign on Scribner at US-1.
9. Narrow turn lanes from US-1 coming into Scribner Avenue intersection.
10. Add crosswalk along western leg of US-1 and George Avenue to connect employee parking lot and Stew Leonard's. (Figure 17)
11. Trim vegetation that blocks signal heads at US-1 and Dry Hill Road.
12. At US-1 and Rampart Road:
  - a) Trim vegetation around the intersection warning sign.
  - b) Move sign if not visible after vegetation is managed.
  - c) Repaint faded crosswalks.
13. Add a Signal Ahead sign on George Avenue approach to US-1.
14. Repaint faded crosswalks at Dry Hill Road.
15. Adopt Access Management Policy to consolidate driveways.
16. Review signal timing at intersections west of the I-95 ramps.

Figure 18, Figure 19, Figure 20, and Figure 21 depict these recommendations.



**Figure 15. Cat Tracks Through Intersection**  
*Source: FHWA*



**Figure 17. Missing Crosswalk at Stew Leonard's**



**Figure 16. No Turn on Red Sign**



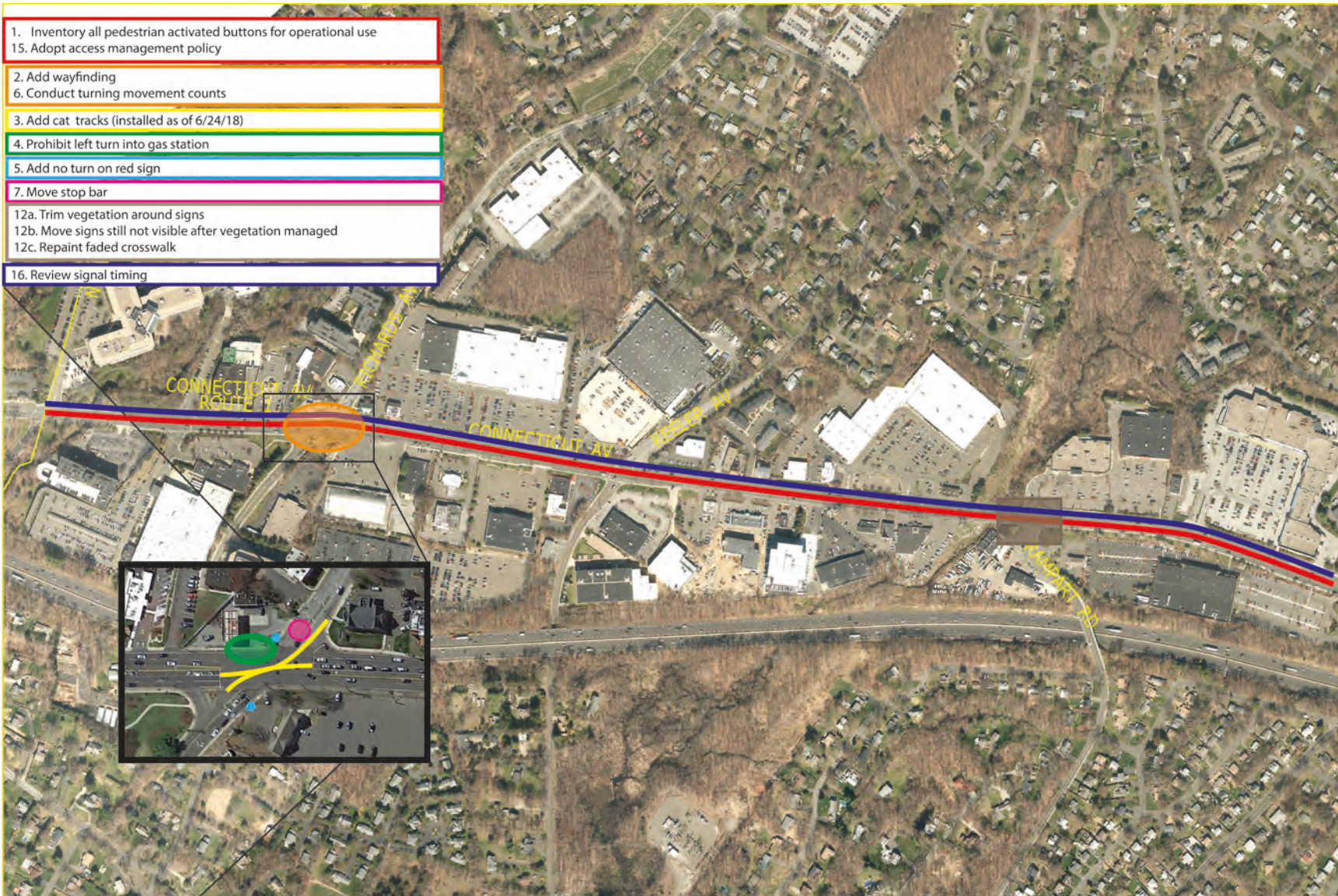


Figure 18. Short Term Recommendations Map 1



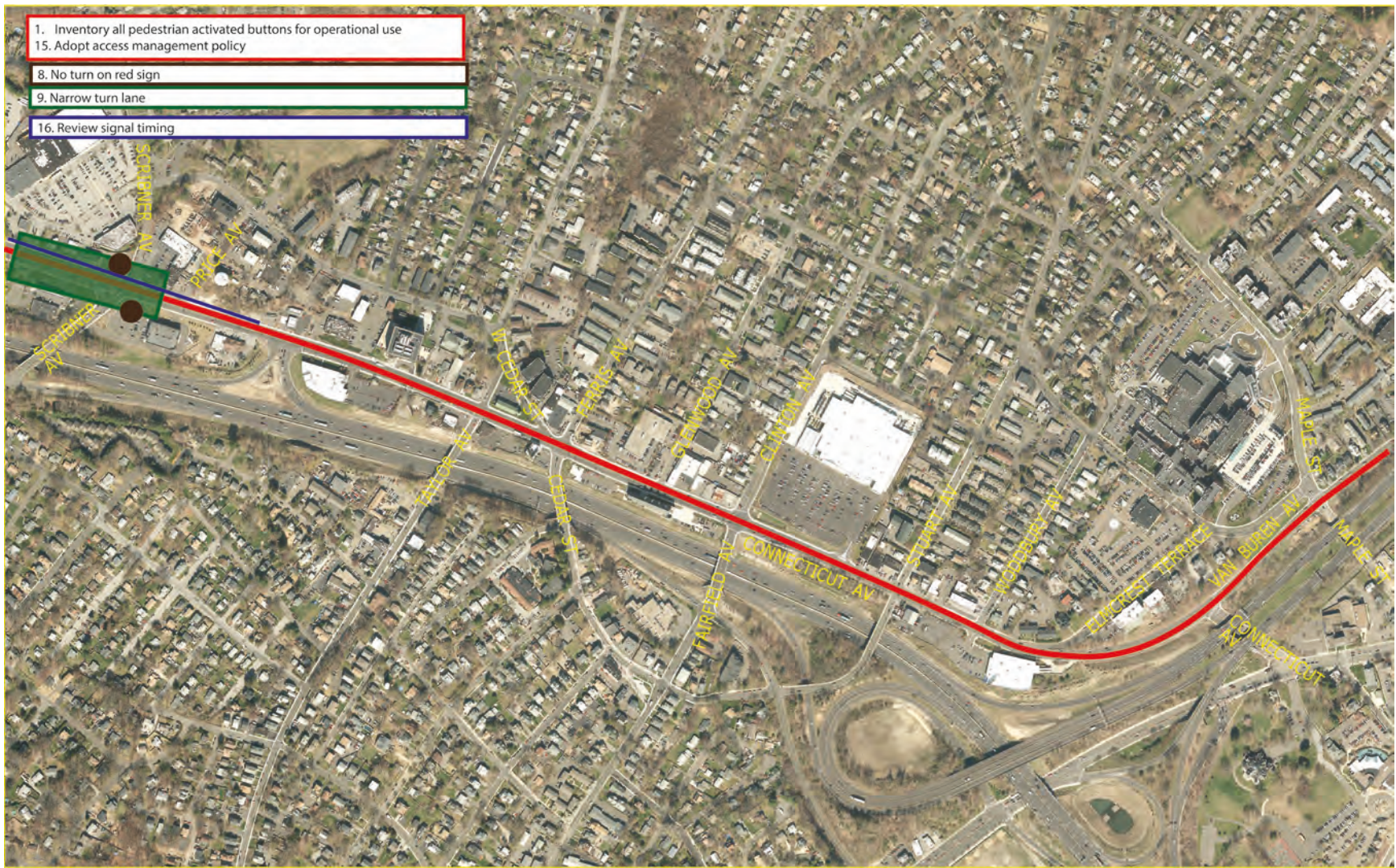


Figure 19. Short Term Recommendations Map 2





Figure 20. Short Term Recommendations Map 3





Figure 21. Short Term Recommendations Map 4

## 4.2 Medium Term

1. Upgrade the pedestrian facilities at US-1 and Richards Avenue with future signal project.
  - a) Install crosswalk perpendicular to Route 1 in line with current pedestrian signal heads.
  - b) With Future Signal Project add retroreflective backplates to the signal heads. (Figure 22).
2. Adjust islands on the southern side of US-1 to accommodate pedestrian crossings at Richards Avenue.
3. Add pedestrian refuge island or extend curbs at US-1 and Keeler Avenue to reduce crosswalk length on the northern leg of Keeler Ave (Figure 23)
4. Relocate wires that block signal head at US-1 and Stew Leonards from the Dry Hill Road approach.
5. Close Driveways on US-1 to employee parking lots- motorists would have to use signalized intersection along Dry Hill Road and George Avenue.
6. At US-1 and Dry Hill Road intersection - add crosswalk on the west side of the intersection.
7. Update pedestrian signal heads to countdown heads.
8. Work with transit providers to add bus stop amenities such as benches and shelters where passenger counts warrant them.



Figure 22. Signal with Retroreflective Backplate



Figure 23. Pedestrian Crossing Island

Figure 24, Figure 25, Figure 26, Figure 27 depict these recommendations.





Figure 24. Medium Term Recommendations Map 1







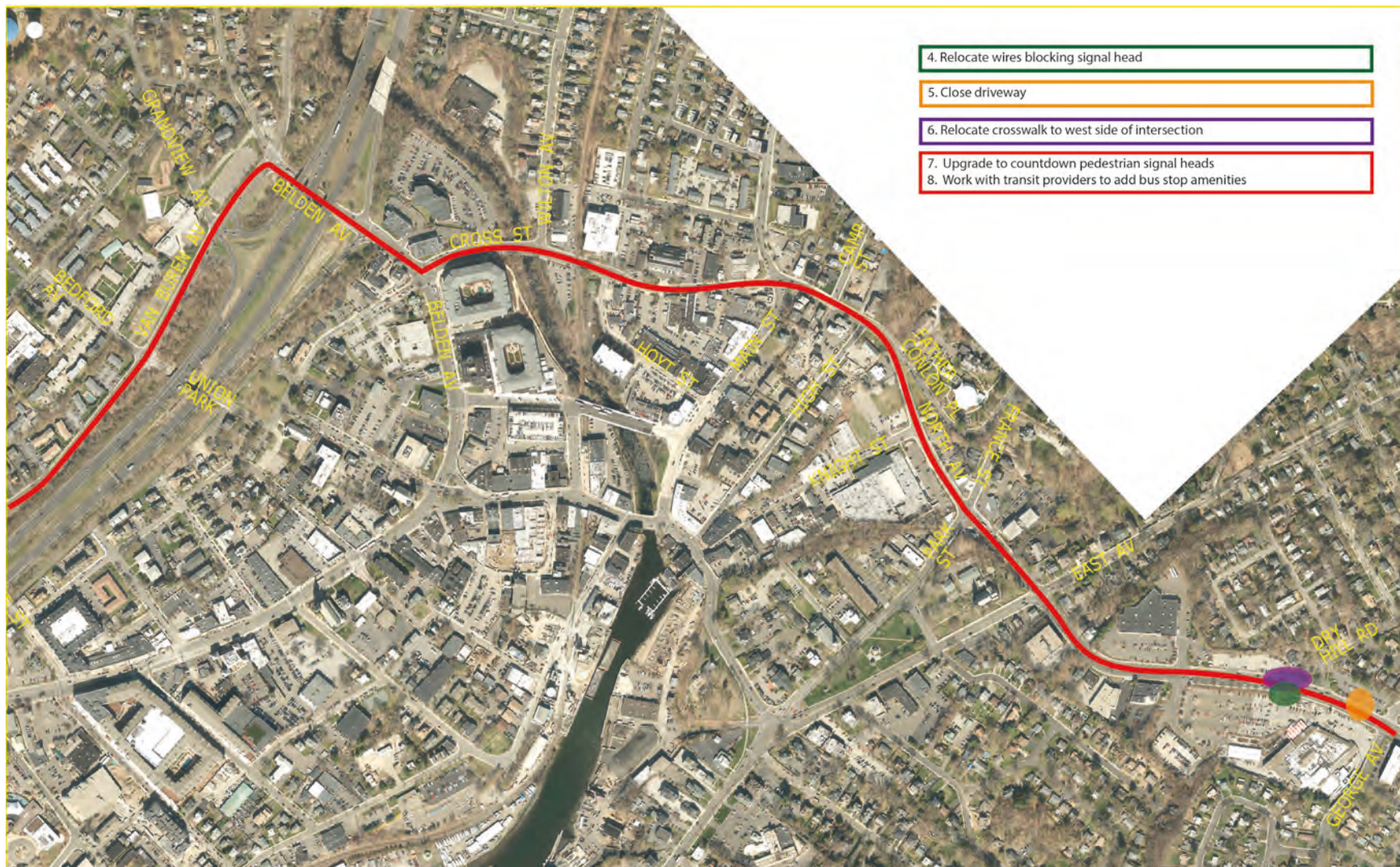


Figure 26. Medium Term Recommendations Map 3





Figure 27. Medium Term Recommendations Map 4

### 4.3 Long Term

1. Add exclusive westbound left turn lane and adjust signal on US-1 for congestion and delay issues at George Avenue. (Figure 28)
2. Fix sidewalk drainage issue on US-1 north of George Avenue.
3. Update all ramps along US-1 to ADA compliance. (Figure 29)
4. Fill in missing sidewalk gaps along US-1 and update those in poor condition.
5. Upgrade all pedestrian signals for ADA compliance, proper timing, and concurrent or exclusive signal phasing.



Figure 29. ADA Compliant Ramp

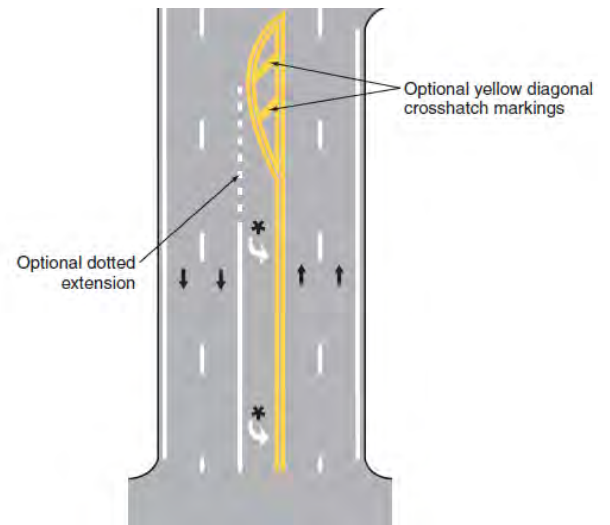


Figure 28. Exclusive Left Turn Lane Diagram

Figure 30, Figure 31, Figure 32, and Figure 33 depict these recommendations.



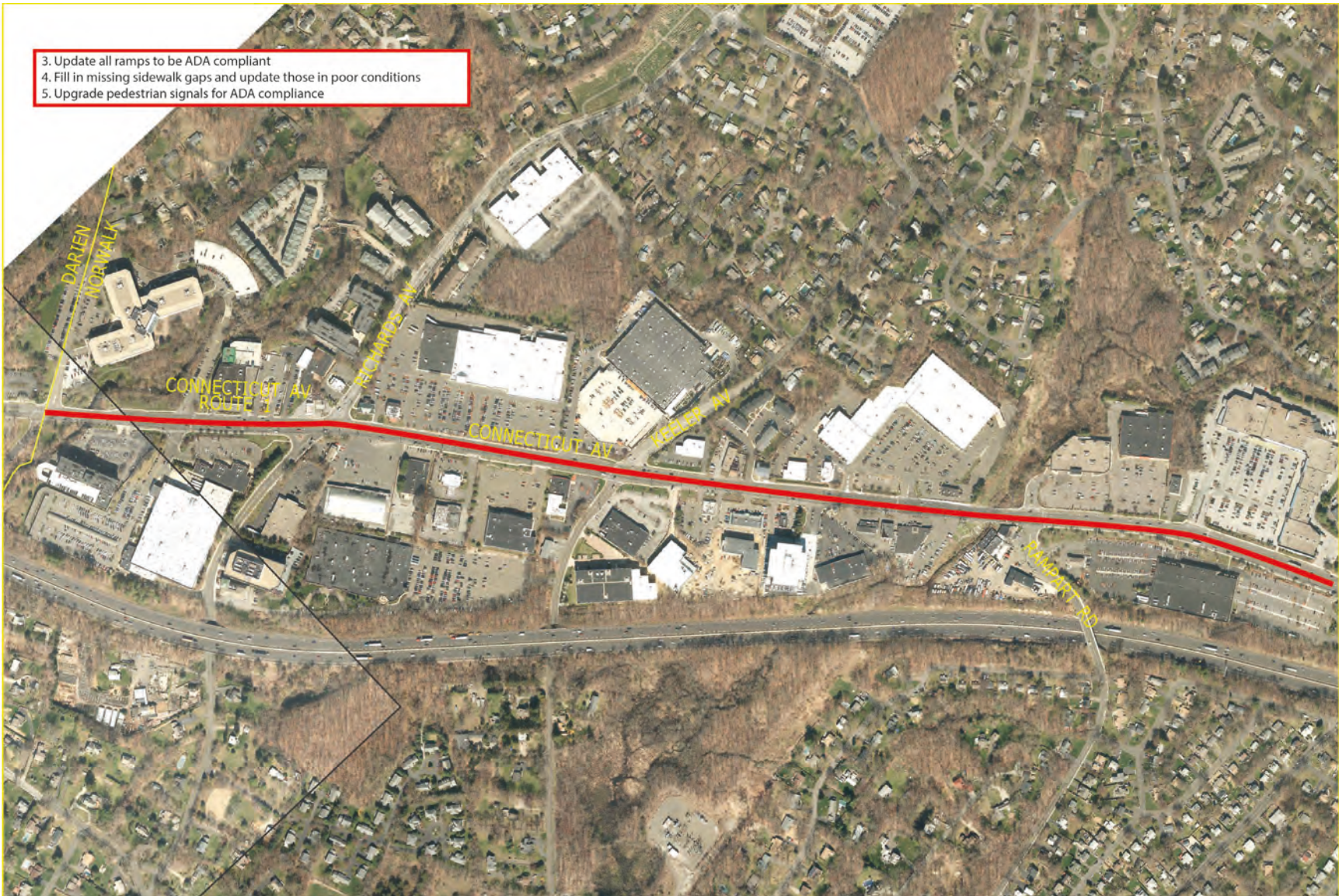


Figure 30. Long Term Recommendations 1





Figure 31. Long Term Recommendations 2



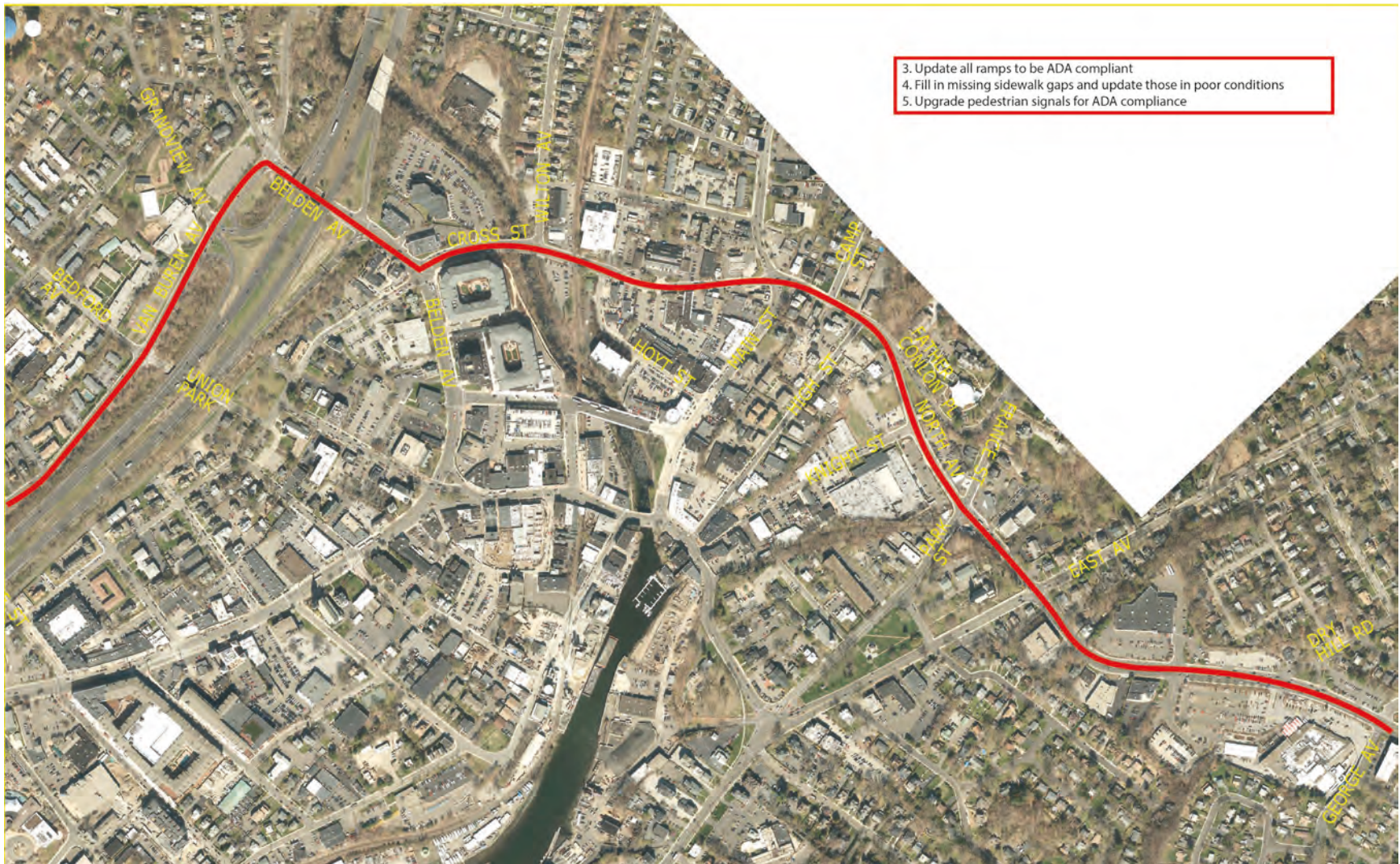


Figure 32. Long Term Recommendations 3





#### 4.4 Summary

This report documents the observations, discussions and recommendations developed during the successful completion of the Town of Norwalk RSA. It provides Norwalk with an outlined strategy to improve the transportation network for all road users on Connecticut Avenue, Van Buren Avenue, Belden Avenue, Cross Street, North Avenue and Westport Avenue (Route 1) particularly focusing on pedestrians and cyclists. Moving forward, Norwalk may use this report to prepare strategies for funding and implementing the improvements, and as a tool to plan for including these recommendations into future development along this segment of US-1.



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# Appendix A



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# Road Safety Audit – Norwalk

**Meeting Location:** Norwalk City Hall, Room 225  
**Address:** 125 East Avenue Norwalk, CT  
**Date:** Monday, June 4, 2018  
**Time:** 8:30 AM

## Agenda

- Type of Meeting:** Road Safety Audit – Pedestrian Safety
- Attendees:** Invited Participants to Comprise a Multidisciplinary Team
- Please Bring:** Thoughts and Enthusiasm!!
- 8:30 AM**                      **Welcome and Introductions**
- Purpose and Goals
  - Agenda
- 8:45 AM**                      **Pre-Audit**
- Definition of Study Area
  - Review Site Specific Data:
    - Average Daily Traffic
    - Crash Data
    - Geometrics
  - Issues
  - Safety Procedures
- 9:30 AM**                      **Audit**
- Visit Site
  - As a group, identify areas for improvements
- 2:00 PM**                      **Post-Audit Discussion / Completion of RSA**
- Discussion observations and finalize findings
  - Discuss potential improvements and final recommendations
  - Next Steps
- 4:30 PM**                      **Adjourn for the Day – but the RSA has not ended**

### Instruction for Participants:

- Before attending the RSA, participants are encouraged to observe the intersection and complete/consider elements on the RSA Prompt List with a focus on safety.
- All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, but are reminded that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.
- After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team.





## Audit Checklist

Pedestrians and Bicycles	Comment
<p><b>Pedestrian Crossings</b></p> <ul style="list-style-type: none"><li>• Sufficient time to cross (signal)</li><li>• Signage</li><li>• Pavement Markings</li><li>• Detectable warning devices (signal)</li><li>• Adequate sight distance</li><li>• Wheelchair accessible ramps<ul style="list-style-type: none"><li>○ Grades</li><li>○ Orientation</li><li>○ Tactile Warning Strips</li></ul></li><li>• Pedestrian refuge at islands</li><li>• Other</li></ul>	
<p><b>Pedestrian Facilities</b></p> <ul style="list-style-type: none"><li>• Sidewalk<ul style="list-style-type: none"><li>○ Width</li><li>○ Grade</li><li>○ Materials/Condition</li><li>○ Drainage</li><li>○ Buffer</li></ul></li><li>• Pedestrian lighting</li><li>• Pedestrian amenities (benches, trash receptacles)</li><li>• Other</li></ul>	



<b>Bicycles</b> <ul style="list-style-type: none"><li>• Bicycle facilities/design</li><li>• Separation from traffic</li><li>• Conflicts with on-street parking</li><li>• Pedestrian Conflicts</li><li>• Bicycle signal detection</li><li>• Visibility</li><li>• Roadway speed limit</li><li>• Bicycle signage/markings</li><li>• Shared Lane Width</li><li>• Shoulder condition/width</li><li>• Traffic volume</li><li>• Heavy vehicles</li><li>• Pavement condition</li><li>• Other</li></ul>	
--	--

<b>Roadway &amp; Vehicles</b>	
<ul style="list-style-type: none"><li>• Speed-related issues<ul style="list-style-type: none"><li>○ Alignment;</li><li>○ Driver compliance with speed limits</li><li>○ Sight distance adequacy</li><li>○ Safe passing opportunities</li></ul></li></ul>	
<ul style="list-style-type: none"><li>• Geometry<ul style="list-style-type: none"><li>○ Road width (lanes, shoulders, medians);</li><li>○ Access points;</li><li>○ Drainage</li><li>○ Tapers and lane shifts</li><li>○ Roadside clear zone /slopes</li><li>○ Guide rails / protection systems</li></ul></li></ul>	

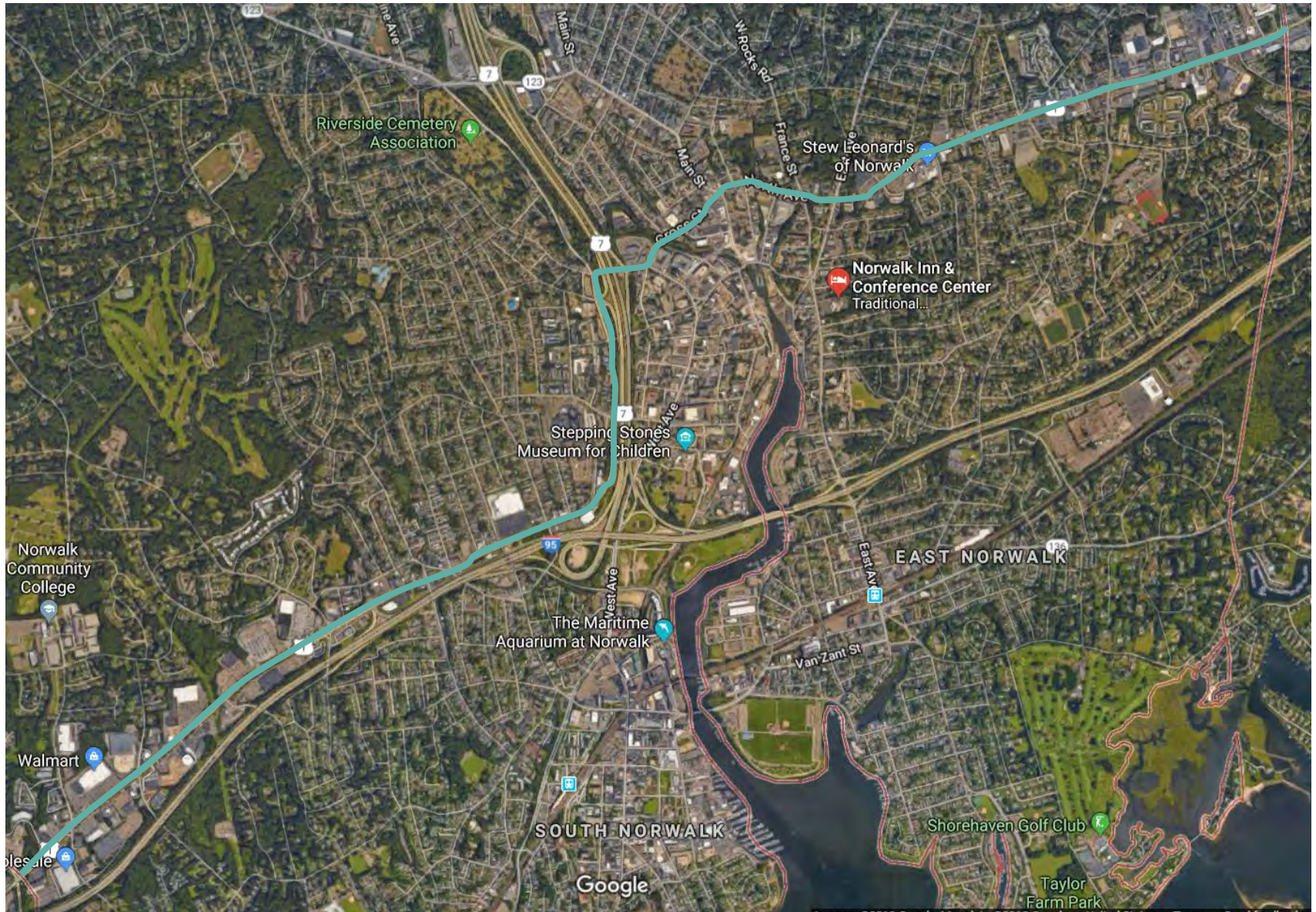
<ul style="list-style-type: none"><li>• Intersections<ul style="list-style-type: none"><li>○ Geometrics</li><li>○ Sight Distance</li><li>○ Traffic control devices</li><li>○ Safe storage for turning vehicles</li><li>○ Capacity Issues</li></ul></li></ul>	
--	--



<ul style="list-style-type: none"><li>• Pavement<ul style="list-style-type: none"><li>○ Pavement Condition (excessive roughness or rutting, potholes, loose material)</li><li>○ Edge drop-offs</li><li>○ Drainage issues</li></ul></li><li>• Lighting Adequacy</li></ul>	
<ul style="list-style-type: none"><li>• Signing<ul style="list-style-type: none"><li>• Correct use of signing</li><li>• Clear Message</li><li>• Good placement for visibility</li><li>• Adequate retroreflectivity</li><li>• Proper support</li></ul></li></ul>	
<ul style="list-style-type: none"><li>• Signals<ul style="list-style-type: none"><li>○ Proper visibility</li><li>○ Proper operation</li><li>○ Efficient operation</li><li>○ Safe placement of equipment</li><li>○ Proper sight distance</li><li>○ Adequate capacity</li></ul></li></ul>	
<ul style="list-style-type: none"><li>• Pavement Markings<ul style="list-style-type: none"><li>○ Correct and consistent with MUTCD</li><li>○ Adequate visibility</li><li>○ Condition</li><li>○ Edgelines provided</li></ul></li></ul>	
<ul style="list-style-type: none"><li>• Miscellaneous<ul style="list-style-type: none"><li>○ Weather conditions impact on design features.</li><li>○ Snow storage</li></ul></li></ul>	



# LOCATION MAP





# ADT MAP

Norwalk





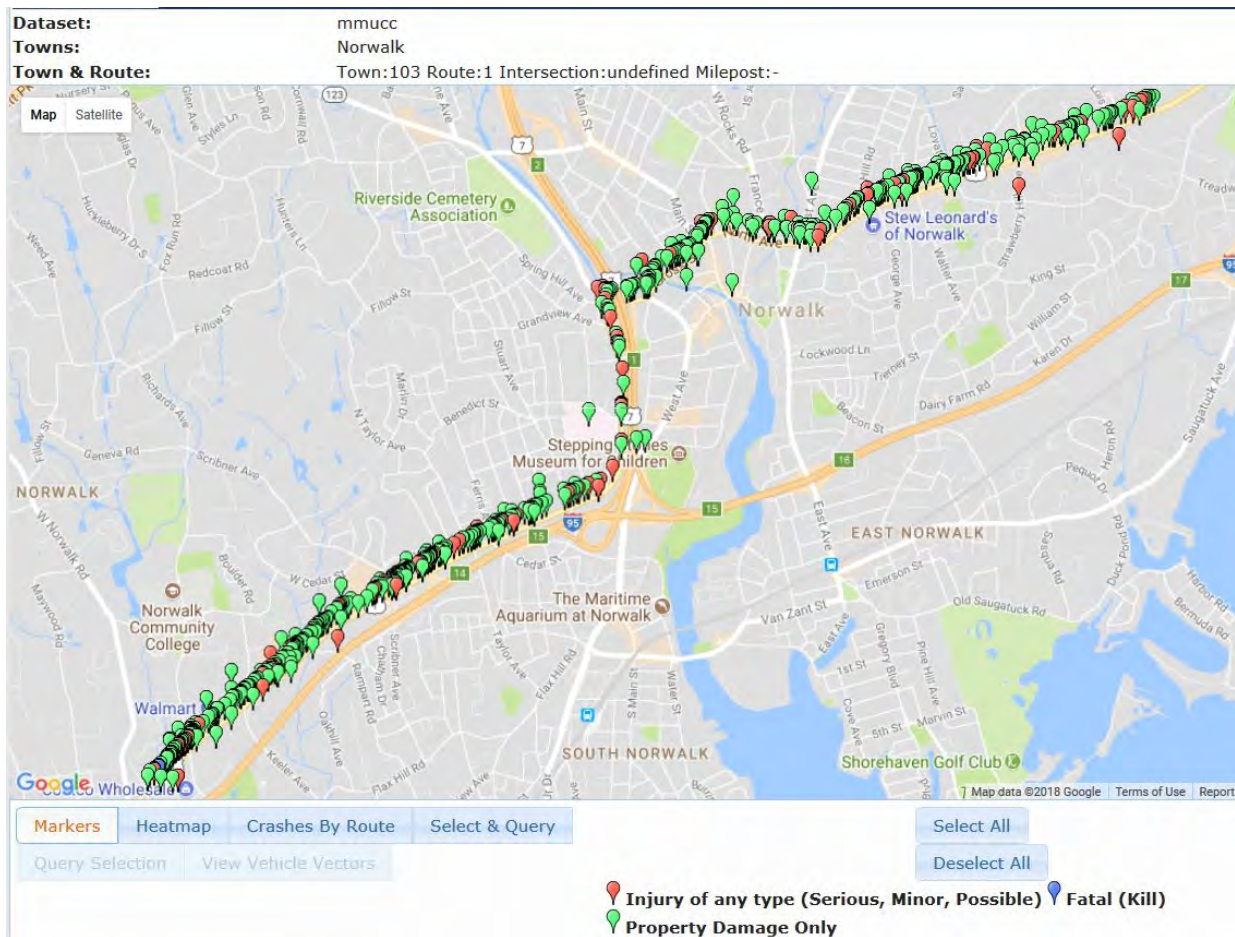


# Road Safety Audit – Norwalk

## Crash Summary

There were 986 crashes in the last 3 years (2015-2017).

There are 2 fatal crashes.

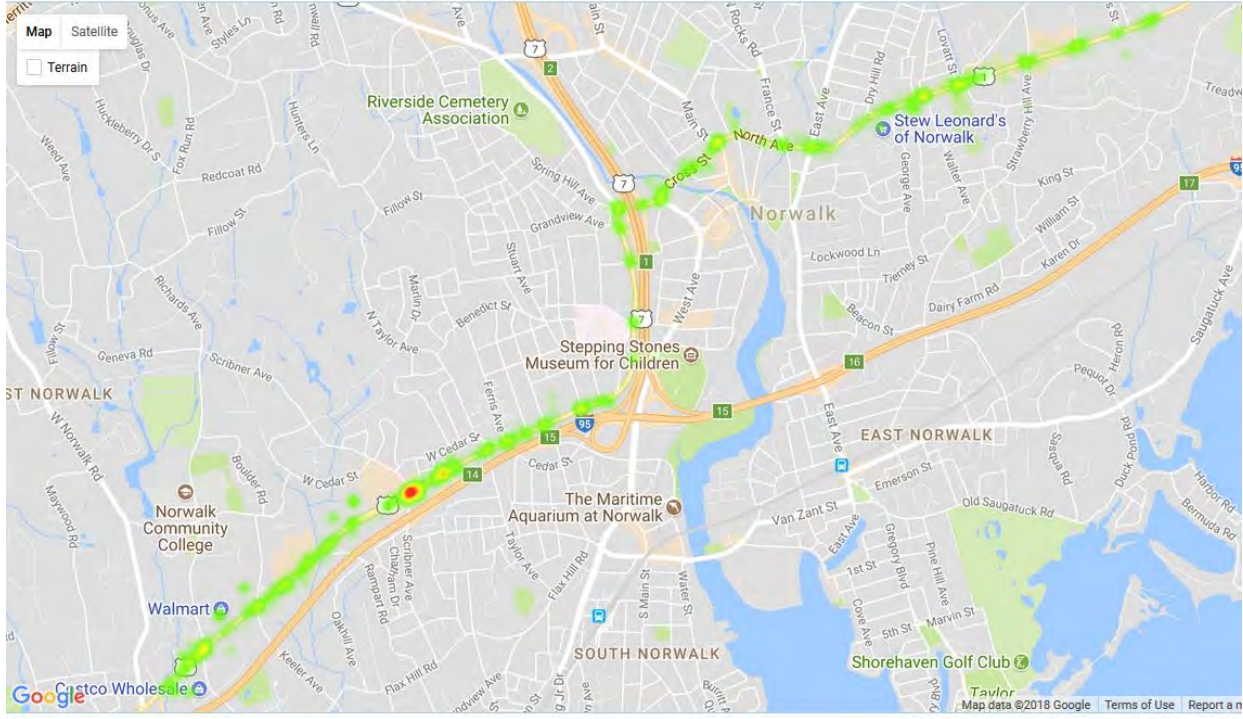






# Heat Map

Dataset: mmucc  
Towns: Norwalk  
Town & Route: Town:103 Route:1 Intersection:undefined Milepost:-



Markers Heatmap Crashes By Route Select & Query  
Query Selection View Vehicle Vectors

Opacity Scale: 80%

Select All  
Deselect All

Injury of any type (Serious, Minor, Possible) Fatal (Kill)  
 Property Damage Only  
Route Segment Scale



Data: 3 years (2015-2017)

Severity Type	Number of Crashes	
Property Damage Only	801	81%
Injury of any type (Serious, Minor, Possible)	183	19%
Fatal (Kill)	2	0%
<b>Total</b>	<b>986</b>	

Manner of Crash / Collision Impact	Number of Crashes	
Front to rear	443	45%
Rear to side	13	1%
Sideswipe, opposite direction	11	1%
Not Applicable	46	5%
Angle	181	18%
Other	55	6%
Sideswipe, same direction	133	13%
Unknown	79	8%
Rear to rear	9	1%
Front to front	16	2%
<b>Total</b>	<b>986</b>	

Weather Condition	Number of Crashes	
Snow	23	2%
Clear	837	85%
Unknown	3	0%
Blowing Snow	8	1%
Rain	77	8%
Cloudy	33	3%
Not Applicable	1	0%
Freezing Rain or Freezing Drizzle	3	0%
Other	1	0%
<b>Total</b>	<b>986</b>	



Light Condition	Number of Crashes	
Daylight	766	78%
Dark-Lighted	192	19%
Dusk	9	1%
Dark-Unknown Lighting	3	0%
Unknown	6	1%
Dawn	2	0%
Dark-Not Lighted	6	1%
Other	2	0%
<b>Total</b>	<b>986</b>	

Road Surface Condition	Number of Crashes	
Snow	18	2%
Wet	136	14%
Dry	817	83%
Ice / Frost	6	1%
Unknown	4	0%
Slush	4	0%
Other	1	0%
<b>Total</b>	<b>986</b>	





Time		Number of Crashes	
0:00	0:59	5	1%
1:00	1:59	3	0%
2:00	2:59	2	0%
3:00	3:59	5	1%
4:00	4:59	5	1%
5:00	5:59	3	0%
6:00	6:59	12	1%
7:00	7:59	30	3%
8:00	8:59	49	5%
9:00	9:59	41	4%
10:00	10:59	40	4%
11:00	11:59	55	6%
12:00	12:59	92	9%
13:00	13:59	105	11%
14:00	14:59	91	9%
15:00	15:59	101	10%
16:00	16:59	74	8%
17:00	17:59	80	8%
18:00	18:59	63	6%
19:00	19:59	50	5%
20:00	20:59	31	3%
21:00	21:59	20	2%
22:00	22:59	15	2%
23:00	23:59	14	1%
<b>Total</b>		<b>986</b>	

Person Type	Number
Driver	1964
Passenger	507
Bicyclist	2
Pedestrian	18





# Road Safety Audit – NORWALK

## Fact Sheet

### Functional Classification:

- Route 1 is classified as a Principal Arterial (Other)

### ADT

- ADT on Route 1 is 29,400 – 12,600

### Population and Employment Data (2016 US Census Bureau):

- Population: 87,701
- Employment: 46,072

### Urbanized Area

- The study area of Route 1 is in the Bridgeport - Stamford Urbanized Area

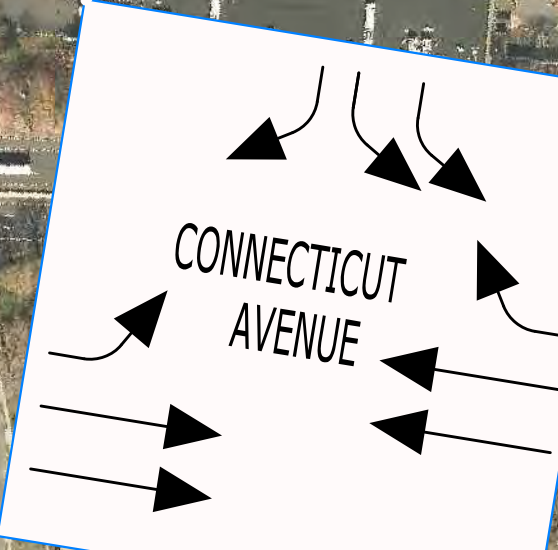
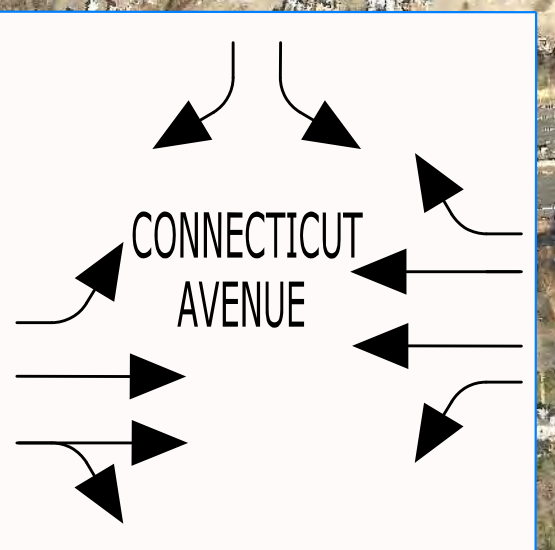
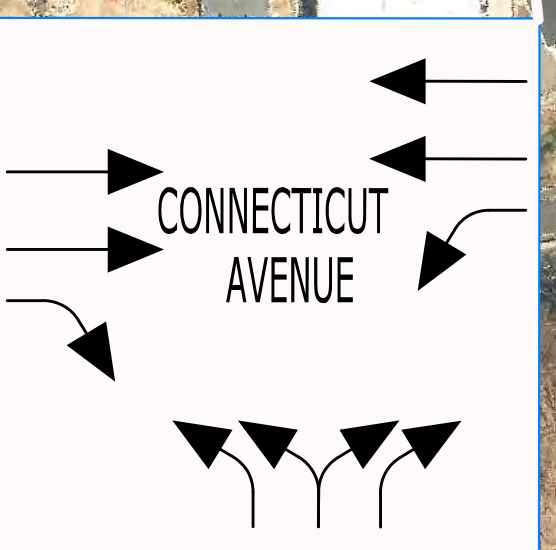
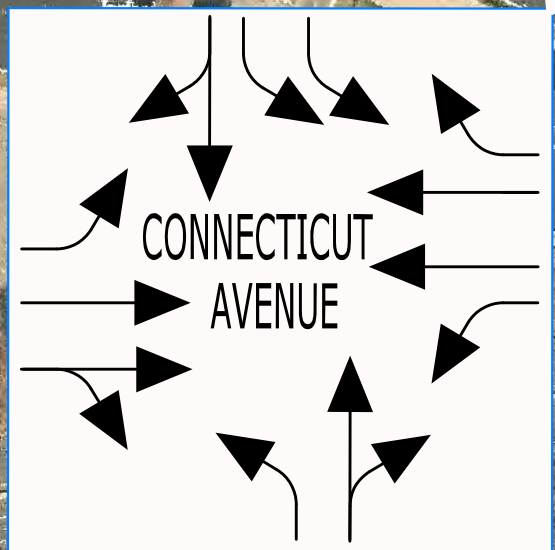
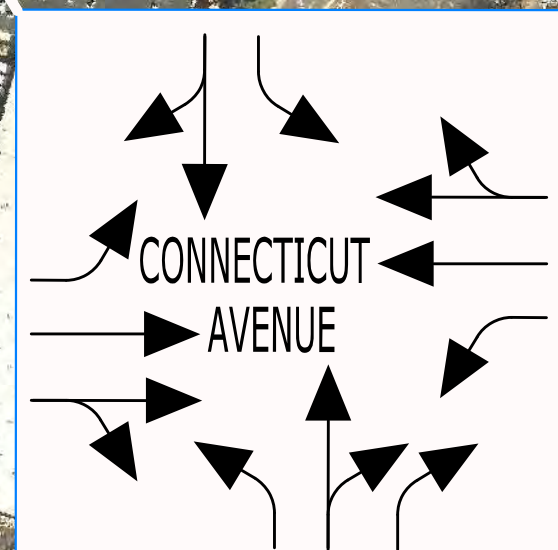
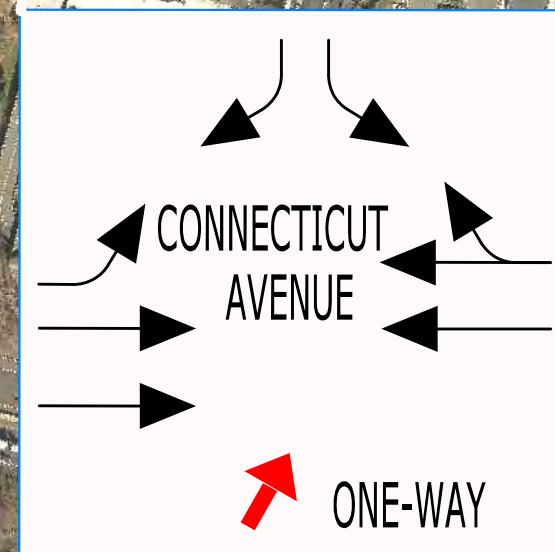
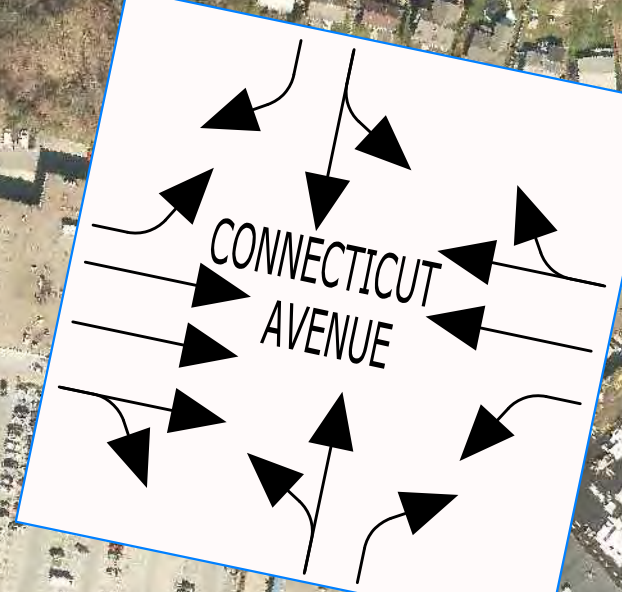
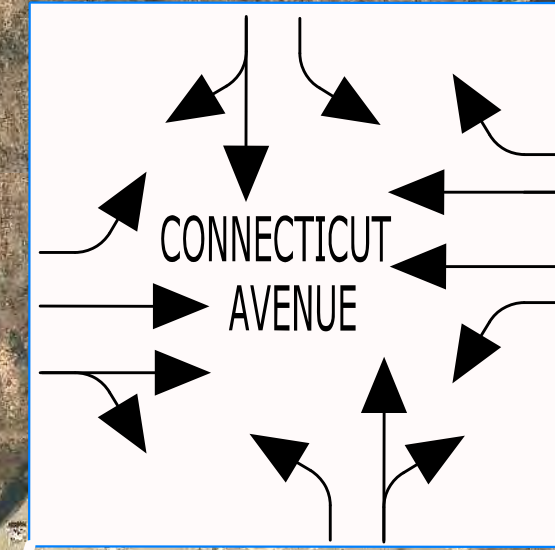
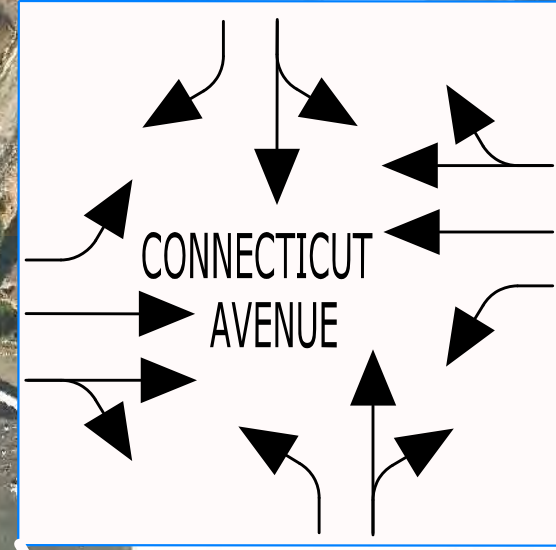
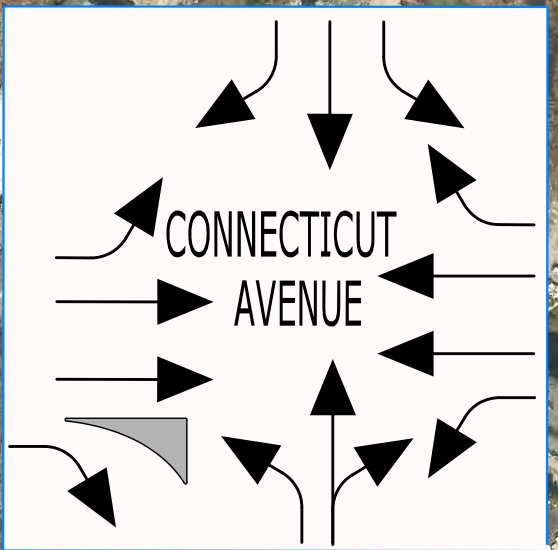
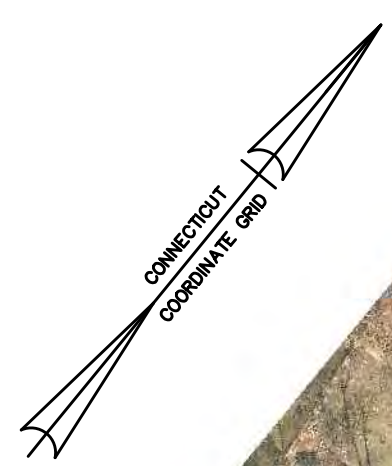
### Demographics

- The statewide average percentage below the poverty line is 10.5%  
The poverty level of Norwalk is 8.4%
- The statewide average percentage minority population is 23%  
The minority level of Norwalk is 28%

### Air Quality

- Norwalk CIPP number 113
- Norwalk is within the NY/NJ/CT Moderate Ozone Area  
PM<sub>2.5</sub> Attainment/Maintenance Area
- Norwalk is within a Southwestern Region CO Attainment Area





MATCH LINE

**LEGEND**

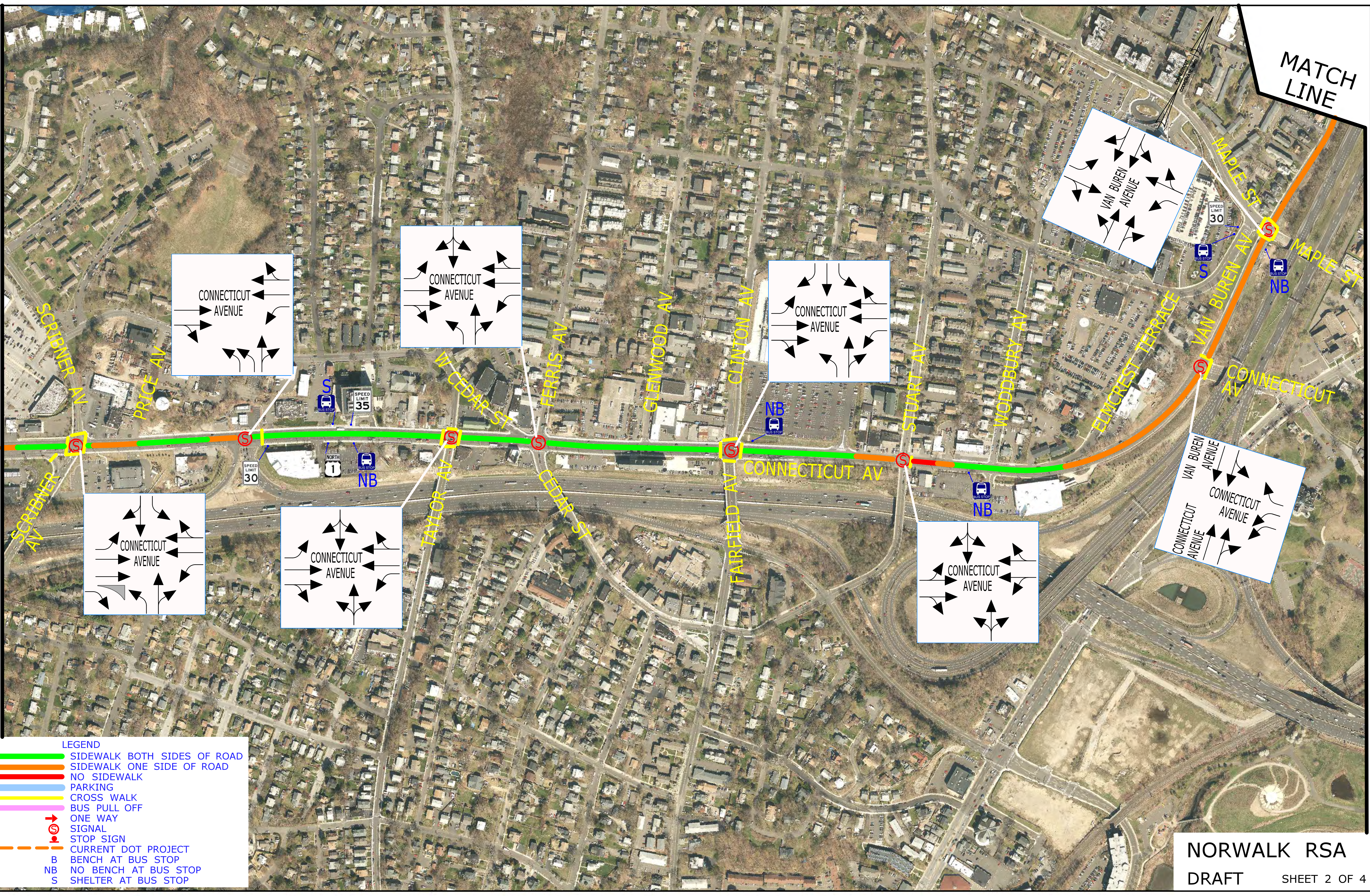
- █ SIDEWALK BOTH SIDES OF ROAD
- █ SIDEWALK ONE SIDE OF ROAD
- █ NO SIDEWALK
- █ PARKING
- █ CROSS WALK
- █ BUS PULL OFF
- ONE WAY
- ⊙ SIGNAL
- ⊙ STOP SIGN
- CURRENT DOT PROJECT
- B BENCH AT BUS STOP
- NB NO BENCH AT BUS STOP
- S SHELTER AT BUS STOP

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MATCH LINE

MATCH LINE

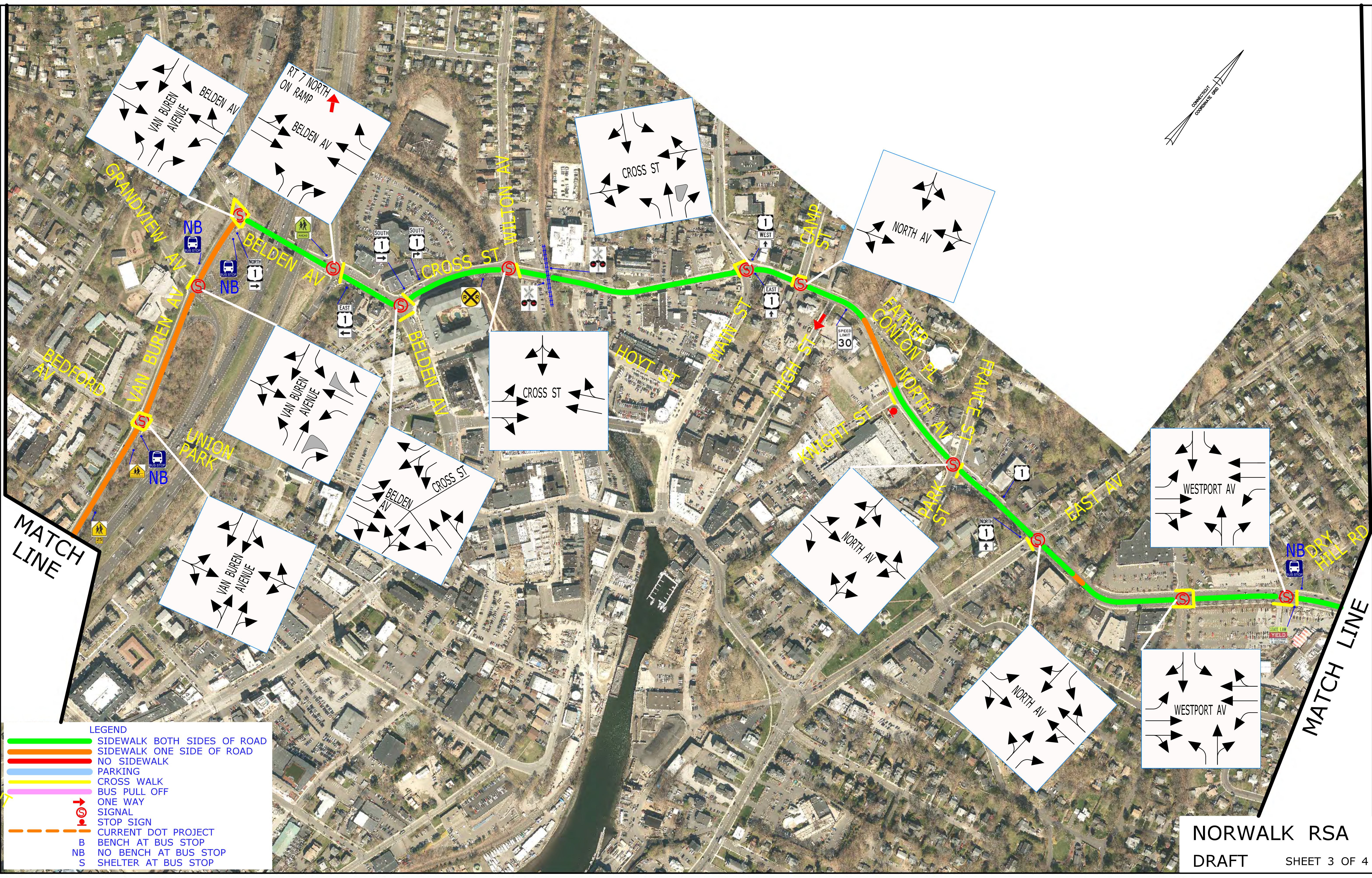
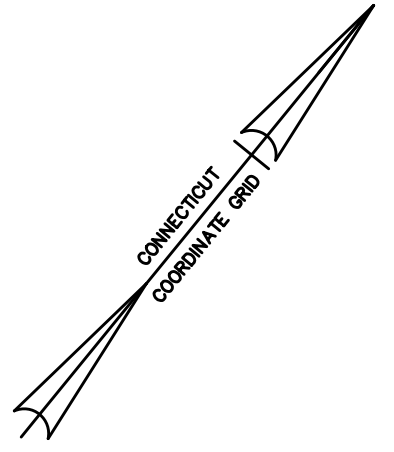


LEGEND

- SIDEWALK BOTH SIDES OF ROAD
- SIDEWALK ONE SIDE OF ROAD
- NO SIDEWALK
- PARKING
- CROSS WALK
- BUS PULL OFF
- ONE WAY
- SIGNAL
- STOP SIGN
- - - CURRENT DOT PROJECT
- B BENCH AT BUS STOP
- NB NO BENCH AT BUS STOP
- S SHELTER AT BUS STOP

5/31/2018  
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9/31/2018  
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- LEGEND**
- SIDEWALK BOTH SIDES OF ROAD
  - SIDEWALK ONE SIDE OF ROAD
  - NO SIDEWALK
  - PARKING
  - CROSS WALK
  - BUS PULL OFF
  - ONE WAY
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  - CURRENT DOT PROJECT
  - B BENCH AT BUS STOP
  - NB NO BENCH AT BUS STOP
  - S SHELTER AT BUS STOP









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# Appendix B



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## Road Safety Audit

**Town: Norwalk**

**RSA Location: Route 1**

**Meeting Location: Norwalk Public Works Department**

**Address: 125 East Avenue Norwalk, CT Room 225**

**Date: June 4th, 2018**

**Time: 8:30am**

## Participating Audit Team Members

Audit Team Member	Agency/Organization
Kevin Tedesco	AECOM
Terry Blake	Norwalk PD
Ken Cussier	DOT Traffic
Anthony Lorenzetti	Uconn T2
Kwame Aidoo	AECOM
Ray Rawth	BPAB
Mila Yewing	DPW
Anna Bergeron	CTDOT
Marlon Pena	CTDOT
Bridget Boucaud	VN Engineers