



COMMUNITY
connectivity program

Greenwich

Downtown

Road Safety Audit

June 7, 2018



AECOM

Built to deliver a better world

Acknowledgements:

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

With assistance from AECOM Transportation Planning Group

Contents

1	Introduction to Downtown Greenwich RSA.....	6
1.1	Location.....	6
2	Pre-audit Assessment.....	8
2.1	Pre-audit Information.....	8
2.2	Prior Successful Effort.....	13
2.3	Pre-Audit Meeting.....	13
3	RSA Assessment	14
3.1	Field Audit Observations.....	14
3.2	Post Audit Workshop - Key Issues.....	21
4	Recommendations.....	26
4.1	Short Term.....	26
4.2	Medium Term.....	29
4.3	Long Term.....	31
4.4	Summary.....	33

Figures

Figure 1, Downtown Greenwich.....	7
Figure 2. Study Area – Regional Context.....	8
Figure 3 Crashes in 2015-2017 Heat Map (Connecticut Crash Data Repository).....	10
Figure 4 Crashes that Occurred in 2015-2017 (Connecticut Crash Data Repository).....	10
Figure 5 Greenwich Downtown - Road Geometrics.....	11
Figure 6 Heavy Truck Route.....	14
Figure 7 Rectangular Rapid Flashing Beacon Installed.....	14
Figure 8 Overgrown vegetation.....	15
Figure 9 Overgrown Vegetation Blocking Signs.....	16
Figure 10 New Pedestrian Crossing signs	17
Figure 11 Yield Sign in Roundabout.....	18
Figure 12 Wide Intersection.....	19
Figure 13 Midblock Crosswalk Blocked	20
Figure 14. Short Term Recommendations.....	28
Figure 15. Medium Term Recommendations.....	30
Figure 16. Long Term Recommendations.....	32

Tables

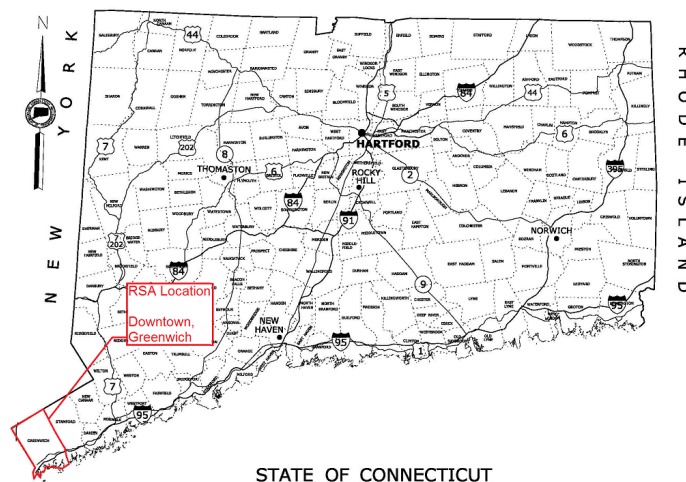
Table 1. Crash Severity 2015-2017	9
Table 2. Crash Type 2015-2017	9
Table 3. Street Inventory	12



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. 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 Downtown Greenwich RSA

The Town of Greenwich requested that an RSA be completed in the Downtown area to improve safety for pedestrians and bicyclists travelling in the Central Business District (CBD). The streets within this study area experience a wide range of traffic volumes (1,900-29,400 vehicles per day (vpd)). Posted speeds are 25 and 30 MPH. The study area does have sidewalks on the majority of the audited roads, although there are some gaps in the network. The Town's main goal is to provide connectivity and better traffic flow for all users in the town center.

The Town of Greenwich's application contained information on issues relating to traffic, parking, ongoing projects, and mapping of the corridor. The application and supporting documentation are included in Appendix A.

1.1 Location

The RSA includes the Downtown area depicted in Figure 1, bounded roughly by Route 1 (East/West Putnam Avenue) on the north, the Metro North rail passenger station and Railroad Avenue on the south, Field Point Road and Soundview Drive on the west, and Mason Street on the east. Figure 2 shows the study area in a regional context. This study area encompasses the Greenwich CBD and is the main retail area in town, but also contains many businesses, restaurants, offices, and residences. The Greenwich Library and the Board of Education main building are located here, as well as the Public Safety Complex (which houses the Police Department and Fire Department), the Town's Senior Center, and an assisted living facility. Many pedestrians walk in this area to access these various places as well as adjacent locations such as the Town Hall, the railroad station and the waterfront. Vehicular traffic is heavy throughout the area and there are many conflict points with pedestrians. The Greenwich CBD is located within the Bridgeport/Stamford Urbanized area.



Figure 1, Downtown Greenwich



Figure 2. Study Area – Regional Context

2 Pre-audit Assessment

2.1 Pre-audit Information

As noted previously, the streets within the study area experience a wide range of traffic volumes (1,900-29,400 vpd Average Daily Traffic). Posted speeds are 25 and 30 MPH. Between 2015 and 2017 there were 702 crashes in the study area. Over one-third of these crashes in the area were angle collisions. Angle collisions, rear end collisions and same direction sideswipes together accounted for 82% of the incidents.

While a majority of crashes (92%) resulted in property damage, 59 (8%) crashes did result in injuries. There were no crashes involving pedestrians or bicyclists between 2015 and 2017, and no crashes caused a fatality.

Table 1 and Table 2 provide additional information on the type of collision and the severity of the crash. Figure 3 and Figure 4 graphically display crashes that occurred in this area during 2015-2017. Crashes are dispersed throughout the RSA area but do cluster more significantly on Route 1, Greenwich Avenue, and Railroad Avenue.

Severity Type	Number Crashes	of
Property Damage Only	643	92%
Injury of any type (Serious, Minor, Possible)	59	8%
Fatal (Kill)	0	0%
Total	702	

Table 1. Crash Severity 2015-2017

Source: UConn Connecticut Crash Data Repository

Manner of Crash / Collision Impact	Number of Crashes	
Front to rear	170	24%
Rear to side	63	9%
Sideswipe, opposite direction	7	1%
Not Applicable	43	6%
Angle	251	36%
Other	3	0%
Sideswipe, same direction	151	22%
Unknown	7	1%
Rear to rear	4	1%
Front to front	3	0%
Total	702	

Table 2. Crash Type 2015-2017

Most roadways within the study area are two lane, bi-directional roads. East/West Putnam Avenue (Route 1) is a four lane bi-directional roadway. Many roads have additional turning lanes at major intersections, and some roads, such as Greenwich Avenue and Bruce Place are one-way.

Most of these roads have street parking on one side, or both sides if space will allow. Parallel parking is most prevalent, but Greenwich Avenue and portions of Railroad Avenue and Fawcett Place have angled, head-in parking.

Roadway geometrics and sidewalk locations within the study area are shown in Figure 5. An inventory of existing conditions can be found in Table 3.



Figure 3 Crashes in 2015-2017 Heat Map (Connecticut Crash Data Repository)

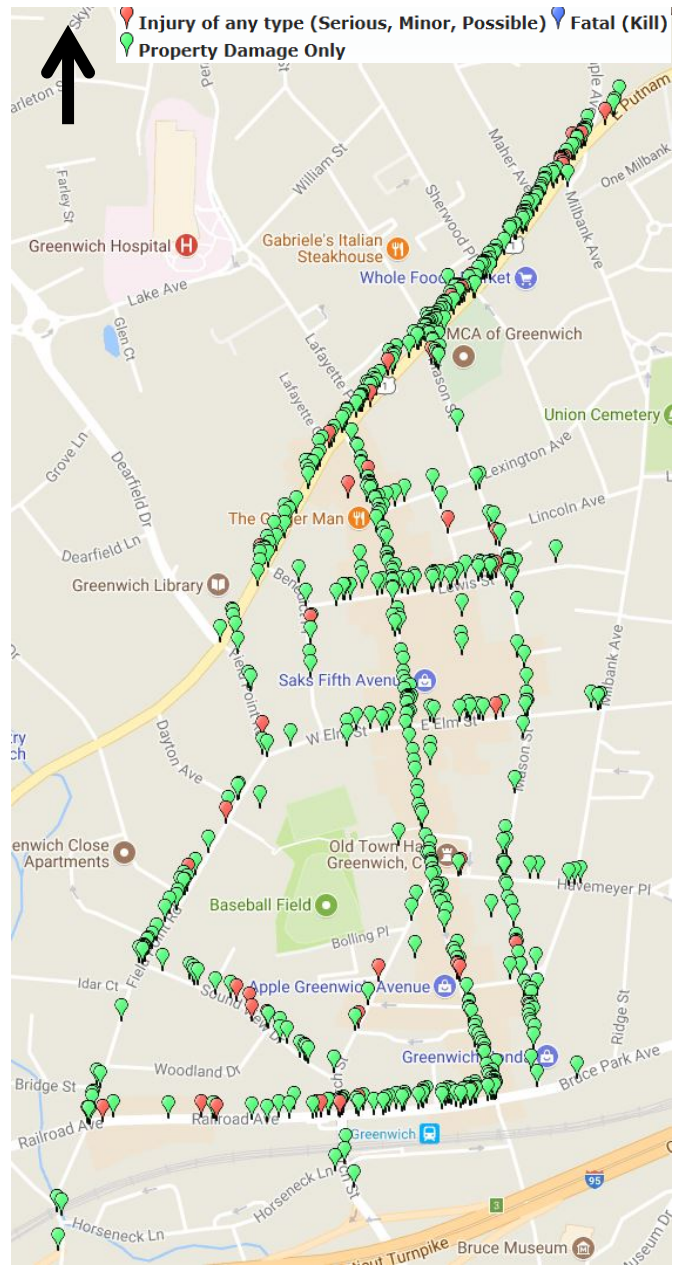


Figure 4 Crashes that Occurred in 2015-2017 (Connecticut Crash Data Repository)

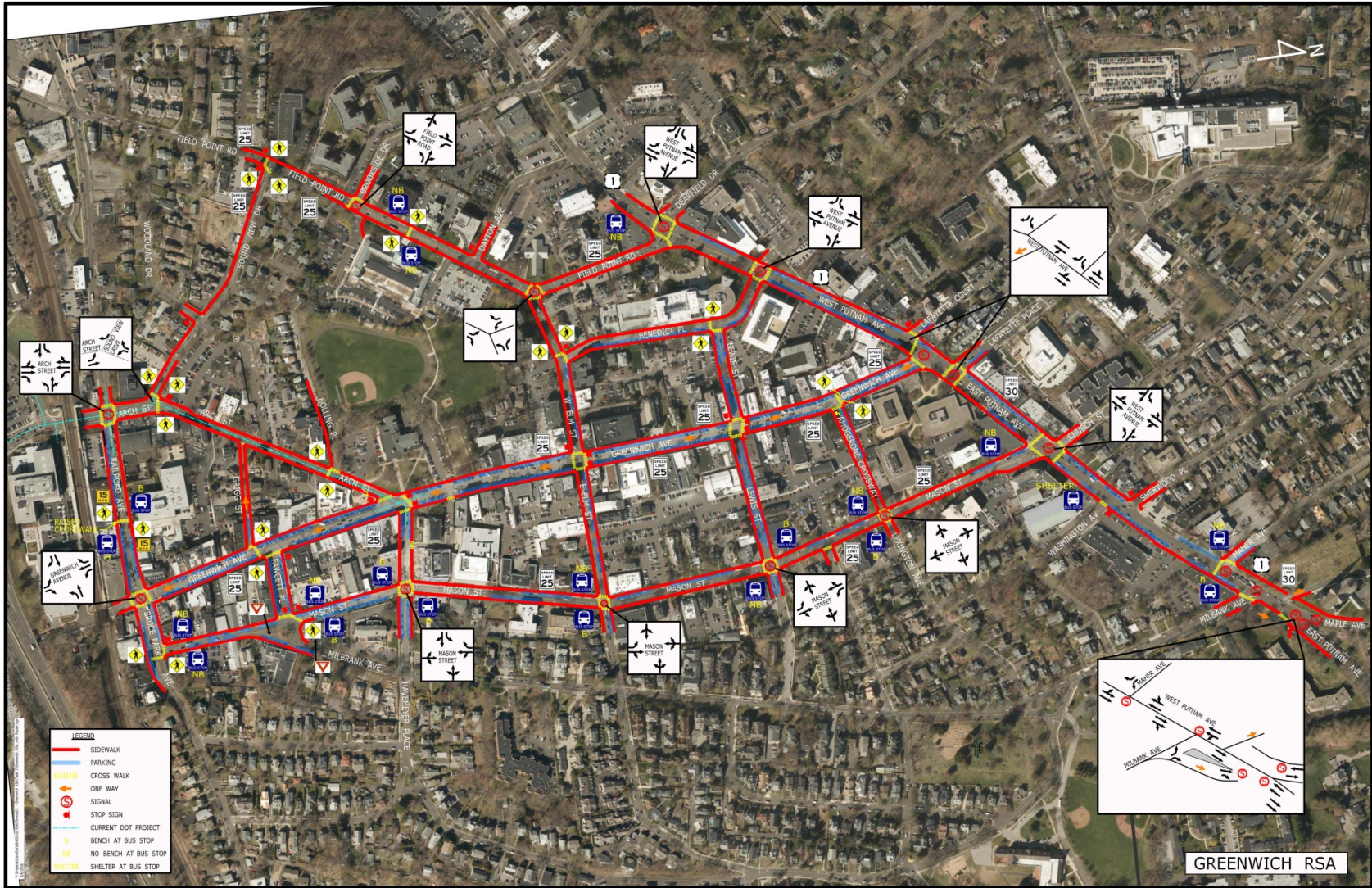


Figure 5 Greenwich Downtown - Road Geometrics

Downtown Greenwich RSA

Street Inventory

Street	From	To	Length	Lanes (Width)	Side	Sidewalk			Curb	Parking	Shoulder	Ramps	
						Type	Width	Condition				Exist	Compliant
Railroad Ave	Arch St	Mason St	1013 ft	1 (14')	EB	Concrete	6'	Fair	Concrete	Yes	Varies	Yes	No
					WB	Concrete	7'	Fair	Concrete	Yes	Varies	Yes	No
Arch St	Railroad Ave	Greenwich Ave	1250 ft	1 (11')	NB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
Sound View Dr	Arch St	Field Point Rd	1310 ft	1 (12')	EB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
					WB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
Field Point Rd	Sound View Dr	Rte 1	1867 ft	1 (11')	NB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
					SB	Concrete	5'	Fair	Concrete	No	Varies	Yes	No
Grigg St	Arch St	Greenwich Ave	440 ft	1 (16') (One way)	EB	Concrete	5'	Fair	Concrete	No	Varies	Yes	No
					WB	Concrete	5'	Fair	Concrete	Yes	Varies	Yes	No
Greenwich Ave	Railroad Ave	W Elm St	1936 ft	2 (13') (One way)	NB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
Greenwich Ave	W Elm St	Rte 1	1520 ft	2 (13') (One way)	NB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
Mason St	Railroad Ave	W Elm St	1880 ft	1 (11')	NB	Concrete	5'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	5'	Fair	Concrete	Yes	Varies	Yes	No
Mason St	W Elm St	Rte 1	1960 ft	1 (12')	NB	Concrete	5'	Fair	Concrete	No	Varies	Yes	No
					SB	Concrete	5'	Fair	Concrete	Yes	Varies	Yes	No
W Elm St/ E Elm St	Field Point Rd	Mason St	1317 ft	1 (11')	EB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
					WB	Concrete	5'	Fair	Concrete	Yes	Varies	Yes	No
Benedict Pl	W Elm St	Rte 1	950 ft	1 (12')	NB	Concrete	5'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	6'	Fair	Concrete	No	Varies	Yes	No
Lewis St	Benedict Pl	Mason St	1011 ft	1 (11')	EB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
					WB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
Rte 1	Field Point Rd	Greenwich Ave	1235 ft	2 (11')	NB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
Rte 1	Greenwich Ave	Maple Ave	1908 ft	2 (11')	NB	Concrete	6'	Fair	Concrete	Yes	Varies	Yes	No
					SB	Concrete	7'	Fair	Concrete	Yes	Varies	Yes	No
Fawcett Pl	Greenwich Ave	Mason St	268 ft	1 (15')	EB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
					WB	Concrete	8'	Fair	Concrete	Yes	Varies	Yes	No
Amogerone Crossway	Greenwich Ave	Mason St	333 ft	1 (13')	EB	Concrete	9'	Fair	Concrete	Yes	Varies	Yes	No
					WB	Concrete	9'	Fair	Concrete	Yes	Varies	Yes	No
Havemeyer Pl	Greenwich Ave	Mason St	531 ft	1 (11')	EB	Concrete	6'	Fair	Concrete	Yes	Varies	Yes	No
					WB	Concrete	6'	Fair	Concrete	Yes	Varies	Yes	No

Table 3. Street Inventory

2.2 Prior Successful Effort

The Town of Greenwich has been proactive in providing amenities for non-motorized users in the downtown area. Most notable efforts include the painted and signed bumpout crosswalks along the Greenwich Avenue corridor, as well as the Rectangular Rapid Flashing Beacon (RRFB) installed at the Railroad Avenue mid-block crossing. These installations provide higher visibility and increase safety for pedestrians.

2.3 Pre-Audit Meeting

The RSA was conducted on June 7, 2018. The Pre-Audit meeting was held at 8:30 AM in the Town Hall located at 101 Field Point Road in Greenwich.

The RSA Team was comprised of staff from AECOM, staff from CTDOT, representatives from several Greenwich departments including the Police, Department of Public Works, Town Highway Department, Town Planning and Zoning Department, Federal Highway Administration, and Western Council of Governments. 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:

The following intersections are all-way stop controlled, but are police officer controlled on weekdays between 9 AM and 5 PM:

- Greenwich Avenue/Arch Street
- Greenwich Avenue/West Elm Street

Concerns/Issues:

- Town looking at new streetscape design along Greenwich Avenue.
- High number of crashes at Mason Street/East Putnam Avenue due to construction.
- Town is considering looking at back-in angle parking.
- Ongoing CMAQ project along Arch Street at I-95 to improve congestion.
- Crashes at existing roundabout at Mason Street/Fawcett Place/Millbank Avenue.
- Town is updating Plan of Conservation and Development.
- East Coast Greenway runs through part of Town, including Route 1.
- Route 1 was audited previously.
- It was noted that all pedestrian signals in the downtown area appeared to be working properly.
- Town will explore opportunities to incorporate RSA recommendations into the Plan of Conservation and Development.

3 RSA Assessment

3.1 Field Audit Observations

Sound View Drive/Field Point Road

- This is an unsignalized T intersection.
- There are high traffic volumes on Field Point Road.
- This is a challenging intersection alignment with steep grades.
- There is confusion for motorists as to who has the right of way. There is only a Stop sign on northbound Field Point Road. Southbound Field Point Road and Westbound Sound View Drive are not controlled. The Soundview Drive left turn onto Field Point Road is prohibited.
- Sight distance is restricted coming uphill on Sound View Drive by a stockade fence and vegetation (apparently on private property).
- This is heavily used as a truck route between I-95 and Route 1 (Figure 6).
- The narrow sidewalk on the east side is being widened as part of the adjacent condo development.
- The town had tried to implement truck weight restrictions on Sound View Drive unsuccessfully.
- A roundabout was discussed as a potential alternative for the intersection.

Brookside Drive and Field Point Road

- This is a signalized T intersection with an exclusive pedestrian phase and a driveway located opposite the stem. The driveway is signal controlled.

Town Hall Crosswalk (Field Point Road)

- This mid-block crossing is controlled with a Rectangular Rapid Flashing Beacon (RRFB) (Figure 7).
- The crosswalk on the west side is within the edge of a driveway.
- There are no advance pedestrian crosswalk signs.
- The west side sign is placed behind a utility pole,



Figure 6 Heavy Truck Route

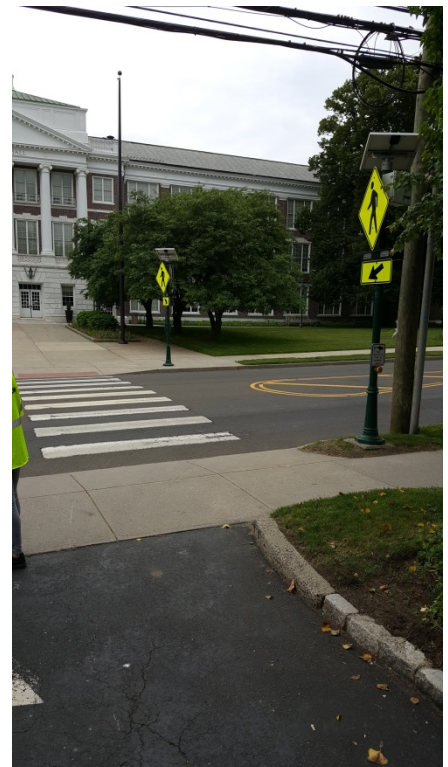


Figure 7 Rectangular Rapid Flashing Beacon Installed

blocking visibility for northbound approaching traffic.

Field Point Road

- Drivers sometimes travel on wrong side of double yellow to make left turns near the Town Hall (where the left turn lane is very short) and Sound View Drive.

Field Point road/West Elm Street

- This is a 3-way, signalized Y-intersection with angled crosswalks on all approaches. All approaches have a right turn lane and a left turn lane.
- The pushbuttons are placed on poles behind the sidewalk.
- The pedestrian phase is exclusive.

West Elm Street/Benedict Place

- This is a stop sign controlled T-intersection.
- The crosswalk is within the driveway on the south side.
- The crosswalk signs are mounted too low.
- The west leg has a bar-type crosswalk. The other crosswalk is a parallel line crosswalk.
- There is overgrown vegetation along the sidewalk (Figure 8).



Figure 8 Overgrown vegetation

Lewis Street/Benedict Place

- This is a stop sign controlled T-intersection.
- The crosswalk signs are mounted too low.
- A parking regulation sign is mounted on a utility pole.
- Parked vehicles on the south leg restrict the intersection sight distance for westbound vehicles.

West Putnam Avenue (US-1)/Field Point Road / Dearfield Drive

- This is a 4 leg, signalized intersection, with the westbound right turn split by a triangular channelizing island and controlled by a yield sign.
- There is an exclusive pedestrian phase.
- Because of the angle of the intersection, it is difficult for motorists turning right on red from Dearfield Drive to see southbound Route 1 traffic and pedestrians that may be crossing during the exclusive pedestrian phase.
- There is a Yield to Pedestrian sign on Dearfield Drive approach but is difficult to see due to vegetation obstruction (Figure 9).
- Route 1 crosswalks are bar-type and side street crosswalks are parallel line.
- Both crosswalks to the north-east corner go to the triangular island. There is then a single crosswalk from the island to the corner, which is not controlled by the signal.

Greenwich Avenue/West Putnam Avenue (US-1) Lafayette Court/Lafayette Place

- This is an Offset intersection, with Lafayette Court intersecting from the north and Greenwich Avenue intersecting from the south, approximately 125 feet apart. Greenwich Avenue is one-way to the south (away from the intersection).
- The three intersections are operated by a single controller. The pedestrian phase is exclusive.
- Westbound vehicles at Lafayette Place previously had problems that cluttered sightlines looking downstream to the signal at Greenwich Avenue and not seeing the signal at Lafayette Place. The mast arm was relocated to help solve this problem.
- There are three crosswalks to cross West Putnam Avenue: one at Greenwich Avenue and two at Lafayette Place.



Figure 9 Overgrown Vegetation Blocking Signs

- The crossing distance across Greenwich Avenue is approximately 80 feet.
- The exclusive pedestrian phase controls the three intersections. Traffic lanes on the northern end of Greenwich Avenue are wide and stacking of cars up to 3 wide was observed in order to make the light on Route 1 from both east and west movements.
- One parallel handicap space is on the east side of Greenwich Avenue near West Putnam Avenue.
- Route 1 crosswalk is bar-type and side street crosswalks are parallel line.
- The crosswalk markings across Lafayette Court are faded.

Greenwich Avenue/Amogerone Crossway

- This is a stop sign controlled T-intersection. Greenwich Avenue is one-way southbound. Head-in angle parking is located on both sides of Greenwich Avenue.
- There are crosswalks on the Amogerone Crossway leg and on the north leg of Greenwich Avenue.
- Drivers on Greenwich Avenue were not seeing signs or pedestrians crossing due to the angle parking. New Pedestrian Crossing signs were installed on moveable bases in the street at the rear of the parking spaces. They are working well (Figure 10).



Figure 10 New Pedestrian Crossing signs

Greenwich Avenue/East & West Elm Street

- This is a four leg all-way stop controlled intersection. Greenwich Avenue is one-way southbound.
- Head-in angle parking is located on both sides of Greenwich Avenue.
- Parallel parking is located on the north side of West Elm Street.
- Police officers direct traffic at this intersection on weekdays due to capacity issues.
- A signal was proposed but never installed.

- There are crosswalks on all four legs.

Fawcett Place

- Fawcett Place is a one-block long bi-directional street between Greenwich Avenue and Mason Street.
- There are 17 head in angle spaces on the south side of the street and 9 parallel spaces on the north side.
- This street is being looked at as a potential pilot test location for back-in angle parking.

Mason Street/Fawcett Place/Milbank Avenue Roundabout

- This is a non-standard configuration for a roundabout.
- There is parallel parking located within the roundabout.
- There are only crosswalks on the Fawcett Place leg and on the north Mason Street leg.
- The southbound Mason Street approach is basically straight through. It is controlled by a stop sign.
- The Fawcett Place approach has no splitter island (just a short, straight island) and is also controlled by a stop sign.
- Northbound Mason Street has a wide splitter island and enters the circle uncontrolled. The circle itself has a Yield sign at this location.
- Southbound Millbank Avenue has a painted splitter and a yield sign.
- The Yield sign within the roundabout creates traffic queues on Fawcett Place and Mason Street for traffic heading south on Mason Street (Figure 11).
- There is no sidewalk on the west side of Millbank Avenue, and the east side sidewalk is asphalt.
- There is a car dealership on the east side of the circle, and he has filled the sidewalk area in front of the dealership with stock vehicles. This is the only continuous sidewalk to Millbank Street.



Figure 11 Yield Sign in Roundabout

- Crossing distances could be reduced through the use of bumpouts to shield the parking lanes.

Mason Street/Bruce Park Avenue

- This is an unsignalized T-intersection, with stop sign control on Mason Street.
- The west leg of Bruce Park Avenue has a through lane and a left turn lane toward the intersection and departing the intersection, with parallel parking on both sides. This creates a very wide roadway (Figure 12).
- There is a steep grade therefore the sight distance is restricted for westbound traffic on Bruce Park Avenue by a hedgerow immediately behind the sidewalk on Mason Street and just behind the curb on Bruce Park Avenue.
- Sidewalk is continuous on the south side of Bruce Park Avenue, on the north side of Bruce Park Avenue west of the intersection, and on the west side of Mason Street. The sidewalk on the east side of Mason Street is narrow and there is no snow shelf. There is no sidewalk on the north side of Bruce Park Avenue east of the intersection.
- Pedestrians were observed crossing Bruce Park Avenue on the west side of Mason Street rather than using the designated crosswalk on the east side.
- Parking on the south side of Bruce Park Avenue is right up to the crosswalk, limiting the sight distance available for pedestrians in the crosswalk. There are posted pedestrian crossing signs.
- There is a moveable “Stop for Pedestrian” bollard placed in the median on the east leg of the intersection.



Figure 12 Wide Intersection

Railroad Avenue (Mid-Block Crosswalk)

- This is a raised, textured crosswalk located mid-block between Greenwich Avenue and Arch Street.
- The crossing has non-standard “high-visibility” flashers mounted within pedestrian crossing

signs, and in-pavement warning lights. Presently, the system is not functioning. There is also a flex-mount pedestrian crossing sign in the center of the road.

- The system uses passive pedestrian detection.
- The crosswalk is frequently blocked by parked cars discharging passengers, or by short-duration stops (Figure 13).

Railroad Avenue/Arch Street

- This is a four-leg, signalized intersection, with exclusive left turn lanes in each direction. Arch Street has two through lanes in each direction, and Railroad Avenue has a single through lane in each direction. North/south movements include a protected/permitted left turn phase, and the westbound left turn is protected. There is an exclusive pedestrian phase for the intersection.
- All four legs have crosswalks.
- The ramps will be upgraded as part of an upcoming Congestion Mitigation and Air Quality (CMAQ) project.
- There are often long traffic queues at this location resulting from capacity constraints and also due to spillback from the I-95 ramp intersections to the south.

Sound View Drive/Arch Street

- This is a three-leg, unsignalized Y intersection, with the south (Arch Street) and north-west (Sound View Drive) legs treated as the through movements, and the north-east leg (Arch Street) stop controlled.
- This is a high incident crash location.
- There are crosswalks on the north-east and north-west legs. Although there are pedestrian crossing signs (mounted too low), crossing is difficult due to the maneuvering through the intersection and the free flow of traffic. Moving traffic is adjacent to the curb line.
- Southbound vehicles from Arch Street (at the stop sign) have difficulty finding gaps in traffic.



Figure 13 Midblock Crosswalk Blocked

Arch Street/Bolling Place

- Senior housing is located adjacent to this intersection.
- Crosswalk crossing Arch Street is located in a commercial driveway on the east side.
- Arch Street crosswalk is bar-type, while Bolling Place is parallel lines.
- Northbound vehicle queues can block the crosswalk.
- Bolling Place Stop sign is not placed correctly, and Stop Bar is missing.
- Pedestrian Crossing signs are too low.

3.2 Post Audit Workshop - Key Issues

Sound View Drive/Field Point Road

- Consider adding RRFB for Sound View Drive crosswalk.
- Evaluate installing a Roundabout.
- Evaluate Field Point Road being converted to one-way southbound from Sound View Drive to Railroad Avenue.

Town Hall Crosswalk (Field Point Road)

- Install advance crosswalk signs on Field Point Road.
- Move crosswalk and RRFB installation north to avoid driveway touchdown on west side, and to improve visibility to west side RRFB.

Field Point Road

- Install "rumble" dotted line around curve to reinforce centerline at Sound View Drive curve.
- Lengthen the left turn lane for traffic entering the north Town Hall driveway by straightening the taper on the double yellow line.

Field Point Road/West Elm Street

- Realign crosswalk on all legs to be perpendicular with the roadway.
- Upgrade signal.

West Elm Street/Benedict Place

- Relocate west leg crosswalk to the east leg of the intersection to eliminate driveway touchdown.
- Consider adding a bumpout to shorten the crossing distance.
- Raise crosswalk sign to 7' vertical clearance.
- Maintain overgrown vegetation on Benedict Place sidewalk.
- Standardize type of crosswalk markings.

Lewis Street/Benedict Place

- Raise crosswalk sign to 7' vertical clearance.
- Remount parking regulation sign on standard post.
- Consider adding a bumpout on southeast corner.
- Eliminate one parking space south of the intersection.

West Putnam Avenue (US-1) /Field Point Road/Dearfield Drive

- Evaluate sightlines and right turn traffic volumes to see if prohibiting right turns on red is warranted.
- Evaluate pedestrian crossing times to determine if they meet latest CTDOT standards, especially in light of the nearby elderly population.
- Trim vegetation to improve sign visibility on Dearfield Drive.
- Standardize type of crosswalk markings.
- Revise the stop bar on the channelized right turn from Field Point Road to a yield line.

Greenwich Avenue/West Putnam Avenue (US-1) Lafayette Court/Lafayette Place

- Evaluate the use of optically programmed signal lenses to reduce issue of motorists viewing downstream signal at Greenwich Avenue.
- Convert the single parallel handicap space on the east side of Greenwich Avenue to an angle space.
- Consider a bump out and reduced radius on the southeast corner to reduce pedestrian crossing distance.
- Consideration should be given to adding the Lafayette Ct crossing to the existing exclusive pedestrian phase.
- Standardize type of crosswalk markings.
- The crosswalk markings on Lafayette Court should be repainted.

Greenwich Avenue/Amogerone Crossway

- Bumpouts should be considered for both crosswalks to shorten crossing distances and protect parking areas.
- If bumpouts are constructed, the Pedestrian Crossing signs could be permanently mounted in the widened sidewalk area.

Greenwich Avenue/West Elm Street

- Bumpouts should be considered for all four crosswalks to shorten crossing distances and protect parking areas.
- If bumpouts are constructed, the Stop signs could be permanently mounted in the widened sidewalk area.
- A signal warrant analysis should be conducted to determine the need for signal installation, and what the impact of a signal would be on capacity and level of service. If deemed acceptable, then a signal can be installed in lieu of the traffic control officer who must direct traffic on a daily basis.
- Wayfinding signs should be added in the area.

Fawcett Place

- The Town will consider converting the angle spaces on south side to back-in spaces as a pilot program, including promoting an education program and monitoring results. The results will be used to determine if the Town wishes to expand the program to other angle parking locations.

Mason Street/Fawcett Place/Milbank Avenue Roundabout

- A traffic study should be conducted to determine ways to improve the operational efficiency of the roundabout. The study will include obtaining turning movement counts and tracking counts. Geometric improvements can be evaluated, including the overall circumference, the approach and departure angles, the size and location of splitter islands, sight lines, and the locations of traffic controls.
- Evaluate improvement options including location of pedestrian paths and crosswalks.
- Consider adding bumpouts to reduce excess roadway width, better channelize vehicular flow, and shorten pedestrian crossing lengths.
- Work with the car dealer to have vehicles removed from the sidewalk area on the east side of the intersection and to return the sidewalk area to its intended pedestrian use.
- Consider adding sidewalk on west side of Milbank Avenue with a connection to the Mason Street sidewalk, and a crosswalk connecting it to the east side sidewalk. Consideration of the large specimen trees along the west side of the street will be

necessary, as well as potential grade changes between the walk and the parking lot adjacent to it.

- Consider upgrading the sidewalk on the east side of Milbank Avenue to a concrete walk.

Mason Street/Bruce Park Avenue

- Consider installing a pedestrian refuge island in the center of Bruce Park Avenue east of the intersection. The pedestrian sign can then be permanently installed in the island. The new sign should use the proper legend "Yield to Pedestrian".
- Consider relocating the crosswalk or adding a new crosswalk on the west side of the intersection.
- Remove parking spaces conflicting with the crosswalk sight distances.
- Add bumpouts on northwest corner and on the south side of the street at the final crosswalk location(s).
- Evaluate road diet options including roundabout and single-lane approaches.

Railroad Avenue Mid-Block Crosswalk

- Repairs should be made to the broken Pedestrian Flashing sign and/or in-pavement warning devices to make them operational.
- Consideration should be given to converting to a standard RRFB installation, which may be better understood by motorists.
- Consideration should be given to eliminating some parking and placing bumpouts on both sides of the street to discourage illegal parking, calm traffic and shorten the crossing distance.
- Consideration should be given to installing a pedestrian refuge island to provide better visibility and safety for pedestrians, as well as calming traffic.

Railroad Avenue /Arch Street

- This intersection will be improved as part of upcoming CMAQ project, including revisions to crosswalks and pedestrian ramps.

Sound View Drive/Arch Street

- Pedestrian crosswalk signs should be raised to 7'.
- Both crosswalks should be moved away from the intersection and made perpendicular to their crossing roadways.
- Installation of RRFB's should be considered.
- The crosswalk on Sound View Drive should be studied for possible elimination.

- Evaluate options to eliminate the southbound Arch Street through movement by channelization or by making Arch Street one-way northbound.
- Conduct a traffic study to determine the potential for signalization at this location.

Arch Street/Bolling Place

- Relocate crosswalk further south on Arch Street to avoid landing in the east side driveway.
- Provide advance crosswalk signage and “Do Not Block” crosswalk sign on northbound approach.
- Investigate the potential for RRFB’s at this location.
- Relocate stop sign and install stop bar on Bolling Place.
- Standardize type of crosswalk markings.

Other

- Evaluate truck routes for potential options. Investigate signing preferred routes.
- Develop a policy for electric charging stations.
- As part of Greenwich Avenue streetscape design, consider removing parking meters and implementing central pay location system. This may provide opportunities for providing new pedestrian amenities such as buffer spaces, landscaping, and street furniture.
- Change current crosswalk policy to adopt one standard crosswalk type, e.g. Bar-type walks.
- Create and enforce tree ordinance to eliminate vegetation encroaching on walkways and sightlines.
- Traffic signal pedestrian crossings must also be ADA compliant relative to pushbutton placement, style, function and signal timing. Countdown heads are now standard, and audible/tactile signals are required.
- Since on-street parking is predominant throughout the area, bumpouts should be considered on most corners where parking can be sheltered and crosswalk distances reduced.

Note: For the purpose of this report, accessibility compliance of pedestrian ramps was only analyzed based on the existence or non-existence of a detectable warning surface.

Geometric, slope and other accessibility standards for pedestrian ramps were not checked during this assessment. It is our understanding that the Town of Greenwich is currently conducting a town-wide pedestrian facilities inventory and accessibility review. Please refer to their data for further details.

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. Revise/change current crosswalk policy to adopt one standard crosswalk type, e.g. bar-type.
2. Create and enforce a tree ordinance
3. Install advance crosswalk signs on Field Point Road at Town Hall Crosswalk.
4. Lengthen the left turn lane for traffic on Field Point Road entering the Town Hall driveway by straightening the taper on the double yellow line.
5. Realign crosswalk on all four legs of Field Point Road/West Elm Street to be perpendicular with the roadway.
6. Relocate crosswalk to the east side of the intersection away from the existing driveway at West Elm Street/Benedict Place.
7. Raise low crosswalk signs to 7' at West Elm Street, Lewis Street, Sound View Drive, Arch Street, and Benedict Place.
8. Consider adding a flush bumpout on southeast corner of Lewis Street/Benedict Place.
9. Maintain overgrown vegetation on Benedict Place, and Dearfield Drive.
10. Move Parking sign from Utility Pole to proper post mounting at Lewis Street/Benedict Place.
11. Eliminate one parking space on Benedict Place south of Lewis Street.
12. Evaluate right turn traffic volumes, sightlines, pedestrian activity, crashes, etc. to see if prohibiting right turns on red is warranted on West Putnam Avenue (US-1)/Field Point Road/Dearfield Drive.
13. Evaluate pedestrian crossing times at West Putnam Avenue (US-1)/Field Point Road/Dearfield Drive.
14. Convert parallel handicap space on east side of Greenwich Avenue near West Putnam to an angle space.

15. Add wayfinding signs throughout the downtown area.
16. Consider converting back-out angle spaces on south side to head out spaces as a pilot program on Fawcett Place; promote education program and monitor results. Consider a "try-it" day for residents.
17. Work with the car dealer at the Milbank Avenue Roundabout to have vehicles removed from the public walkway.
18. Change center pedestrian bollard sign to "Yield to Pedestrian" at Mason Street/Bruce Park Avenue.
19. Consider relocating the crosswalk or adding a crosswalk on the west side of the intersection of Mason Street/Bruce Park Avenue. Remove on-street parking spaces, as necessary.
20. Repair the broken Pedestrian Flashing Sign and in-pavement warning devices at the Railroad Avenue mid-block crosswalk.
21. Move crosswalks away from the intersection and make them perpendicular to the crossing roadway at Arch Street and Sound View Drive.
22. Eliminate crosswalk on Sound View Drive at Sound View Drive/Arch Street.
23. Relocate crosswalk further south on Arch Street and provide advance crosswalk signage and "Do Not Block" crosswalk sign on northbound approach at Arch Street/Bolling Place.
24. Relocate Stop sign and install stop Bar on Bolling Place approaching Arch Street.
25. Develop a policy for electric charging stations.
26. As part of Greenwich Avenue streetscape design, consider removing parking meters and implementing central pay location system. This may provide opportunities for providing new pedestrian amenities such as buffer spaces, landscaping, and street furniture.

Figure 14 depicts some of these recommendations.

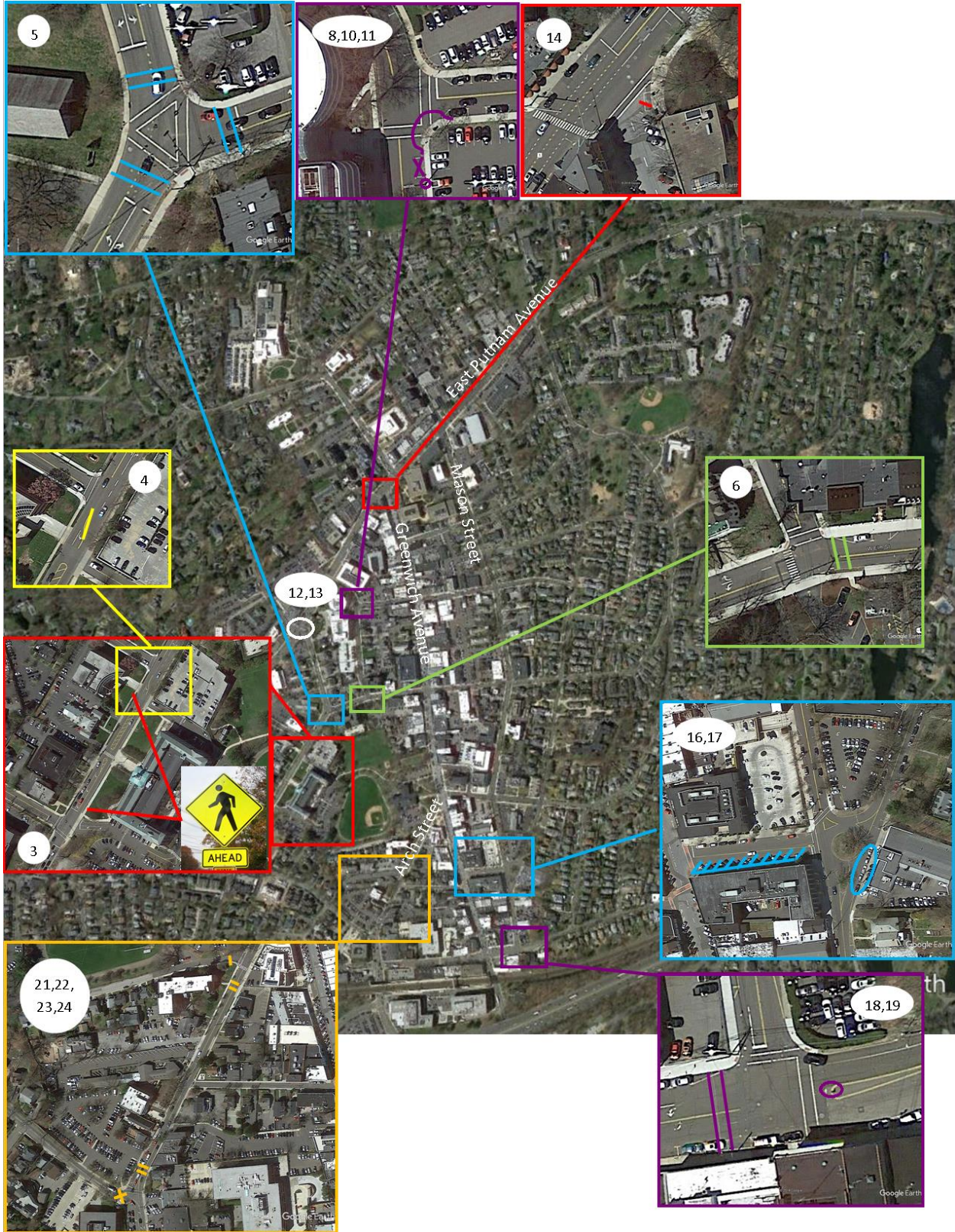


Figure 14. Short Term Recommendations

4.2 Medium Term

1. Consider installing RRFB's at:
 - a. Sound View Drive/Field Point Road.
 - b. Railroad Avenue Mid-block crossing (standard installation).
 - c. Sound View Drive/Arch Street.
2. Evaluate making Field Point Road one-way southbound.
3. Move crosswalk and RRFB installation north of driveway at Town Hall mid-block crosswalk on Field Point Road.
4. Install "Rumble" dotted center line around Field Point Road/Sound View Drive curve.
5. Evaluate optical signal lenses to reduce issue of motorists viewing downstream signal at the intersection of Greenwich Avenue/West Putnam Avenue (US-1).
6. Consider extending the curb and installing bumpouts at:
 - a. the southeast corner of Greenwich Avenue/West Putnam Avenue (US-1).
 - b. West Elm Street/Benedict Place.
 - c. Lewis Street/Benedict Place.
 - d. Greenwich Avenue at all cross streets.
 - e. Mason Street/Fawcett Place/Milbank Avenue Roundabout.
 - f. Mason Street/Bruce Park Avenue.
 - g. Railroad Avenue Mid-block Crossing.
7. Consider including the Lafayette Court pedestrian crossing in the exclusive pedestrian phase at the Putnam Avenue intersection.
8. Consider adding a pedestrian refuge island at the Railroad Avenue mid-block crossing.
9. Evaluate improvement options including adding splitter islands, overall circumference, deflection angles, sight lines, pedestrian paths, crosswalk locations, and traffic controls for the Mason Street/Fawcett Place/Milbank Avenue Roundabout.
10. Evaluate road diet options including roundabout and one-lane approaches for Mason Street/Bruce Park Avenue.
11. Construct a median island on Bruce Park Avenue for traffic calming at Mason Street/Bruce Park Avenue.
12. Evaluate truck routes for potential alternate options throughout the downtown area

Figure 15 depicts some of these recommendations.

4.3 Long Term

1. Evaluate installing a roundabout at Sound View Drive/Field Point Road.
2. Upgrade the traffic signal at Field Point Road/West Elm Street.
3. Conduct a study to determine if a signal is warranted at Greenwich Avenue/West Elm Street, and install the signal if it is warranted.
4. Consider adding sidewalk on the west side of Millbank Avenue with connection to Mason Street, and a pedestrian crossing to the east side of the street.
5. Upgrade the sidewalk on the east side of Milbank Avenue.
6. Evaluate options to eliminate the southbound Arch Street through movement by channelization or by making Arch Street one-way northbound.
7. Revisit all pedestrian ramps for ADA compliance, and upgrade ramps as parts of other projects, or as a targeted project over the next several years.

Figure 16 depicts some of these recommendations.

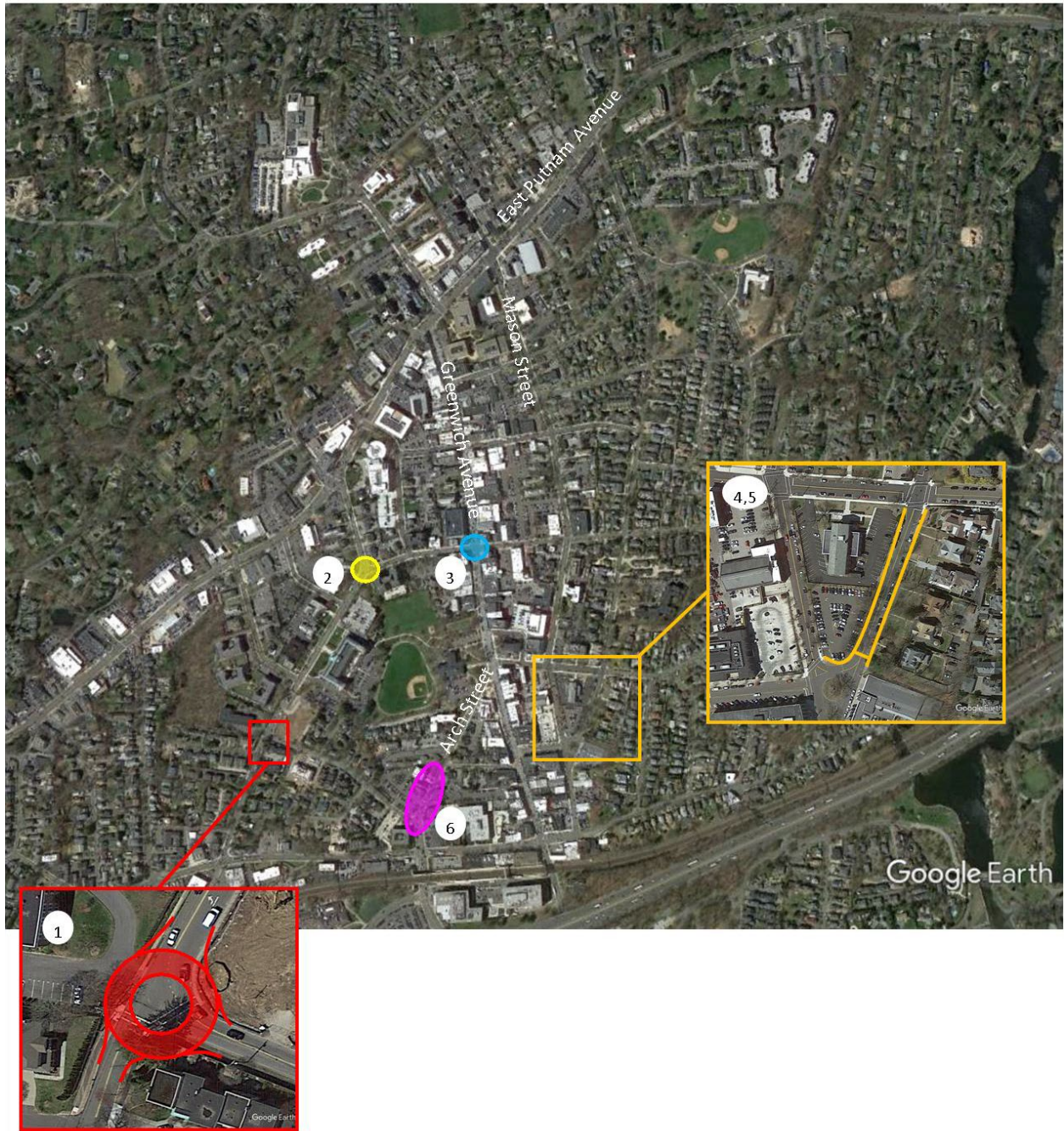


Figure 16. Long Term Recommendations

4.4 Summary

This report documents the observations, discussions and recommendations developed during the successful completion of the Town of Greenwich Downtown RSA. It provides Greenwich with an outlined strategy to improve the transportation network for all road users in Central Business District of Greenwich, particularly focusing on pedestrians and cyclists. Moving forward, Greenwich 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 in the vicinity of the town center.