BRIDGEPORT ROAD SAFETY AUDIT

ROUTE 1: SHERIDAN STREET TO BRUCE AVENUE

CONNECTICUT DEPARTMENT OF TRANSPORTATION 125 1895 - 2020

SEAL OF THE CITY OF BRIDGEPORT, CONNECTICUT INCORPORATED 1836

COMMUNITY connectivity program

FHI studio

JANUARY 2022

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1 COMMUNITY CONNECTIVITY PROGRAM

1.1 Program Background

The Connecticut Department of Transportation (CTDOT) has created a Community Connectivity Program that focuses on improving the state's transportation network for all users. A major component of this program is conducting Road Safety Audits (RSAs) at selected locations. An RSA is a formal safety assessment of the existing roadway. 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 and/or severity.

The RSA team includes CTDOT staff, municipal officials and staff, municipal police, local stakeholders, FHI Studio staff, and community leaders. The 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, roadway geometrics, crash data, roadway inventory (i.e. signage, curbs, bicycle/pedestrian facilities, amenities, safety components), and sidewalks.

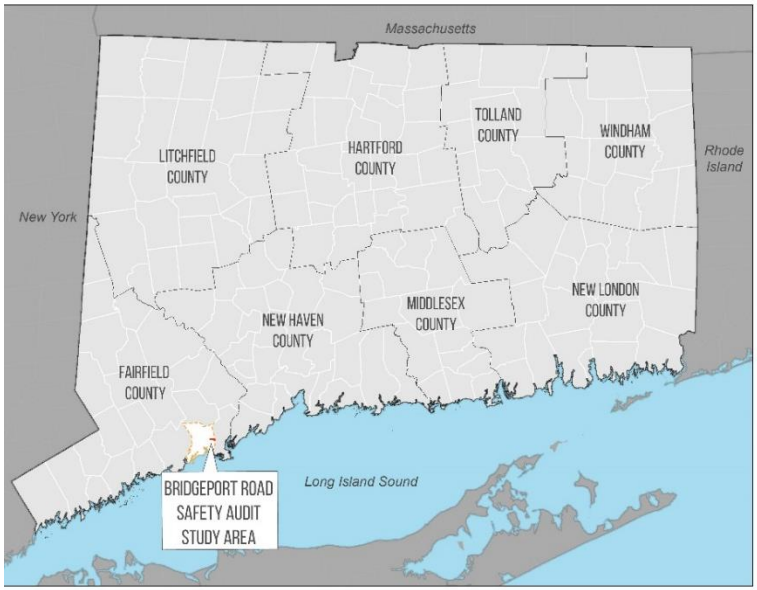
Each RSA is conducted using RSA protocols published by the FHWA. For details on this program, please refer to the CT Connectivity RSA site on the CTDOT webpage.

Prior to the site visit, area topography, land use characteristics, intersection sight distance concerns, sidewalk locations, parking, and bicycle facilities are examined using available mapping and imagery. 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 and the summary results are discussed in the following sections.

1.2 Bridgeport RSA Study Area and Location

CTDOT sponsored an RSA for the City of Bridgeport in the Mill Hill neighborhood in the east side of Bridgeport. The study area encompasses Route 1 between Sheridan Street and Bruce Avenue (Stratford). Exhibit 1 shows the study area in context to the State of Connecticut, while Exhibit 2 shows the Study Area in further detail

Exhibit 1: Bridgeport RSA Regional Location



The purpose of the RSA is to observe any safety concerns while discussing possible safety improvements for pedestrians and bicyclists travelling along the study area corridor. The study area serves many purposes including local and regional truck traffic, residential and business access, employment commuting, access to points throughout Bridgeport and Stratford areas, and pedestrian routes to serve the residential neighborhoods. See Exhibit 3 for points of interest located along the corridor.

Route 1 is a U.S. route that provides an east to west connection between Fairfield County communities as well as north to south route along the eastern seaboard. Major roadways also dissect the study area. These include Seaview Avenue, Grant Street, Barnum Avenue which are minor arterials. Palisade Avenue, Granfield Avenue, Success Avenue, Central Avenue, East Avenue which are collector roadways. This corridor experiences medium to high traffic volumes between 14,000 to 22,000 vehicles per day, with higher volumes located near the western edge of the corridor between Sheridan Street and Palisade Avenue. The study area does have sidewalks and crosswalks but lacks bicycle facilities. Some sidewalks are in poor condition, and crosswalks are present in a few locations. Bridgeport is a Connecticut's largest community by population. It functions as an employment, institutional, commercial, and recreational center to the region.

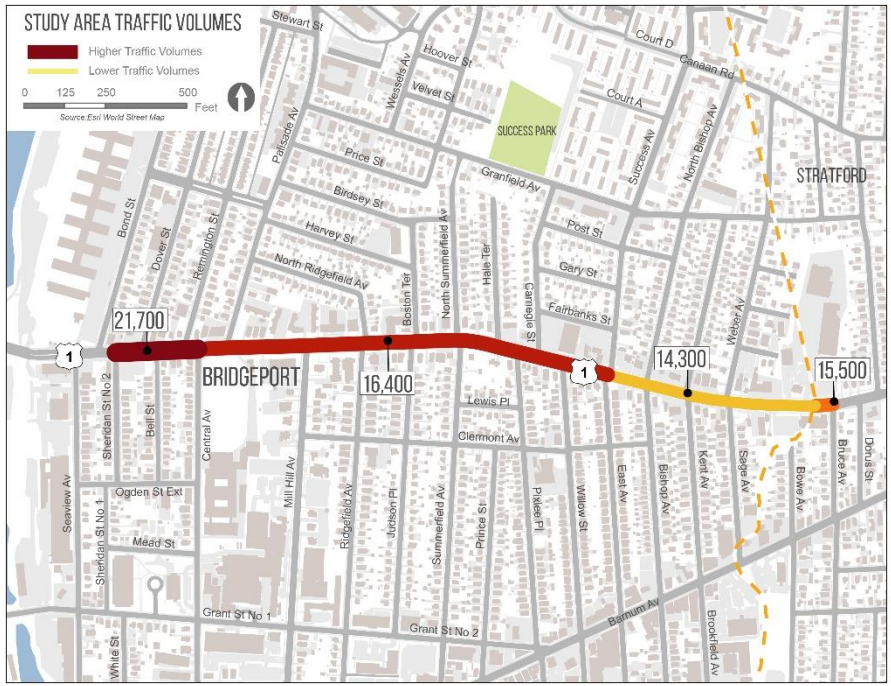
Average Daily Traffic (ADT) in the study area ranges between 21,700 vehicles per day at the west end of the study area (Sheridan Avenue to Central Avenue) to 14,300 vehicles per day at the east end of the study area between East Avenue to the Stratford town line. See Exhibit 4. The study area has two lanes in each direction between Sheridan Avenue and Central Avenue. Between Central Avenue and Palisade Avenue is one lane in the northbound direction and two lanes in the southbound direction. Between Palisade Avenue and Bruce Avenue the roadway drops to one lane in each direction with the exception of turning lanes provided in the southbound direction at Mill Hill Avenue and in the southbound direction at Pixlee Place.

There are six signalized intersections in the study area. These are located at Route 1 and the intersections of Central Avenue, Palisade Avenue, Mill Hill Avenue, East Avenue, Bishop Avenue, and Bruce Avenue.

Exhibit 2: Bridgeport RSA Study Area

Exhibit 3: Study Area Points of Interest

Exhibit 4: Average Daily Traffic Volumes

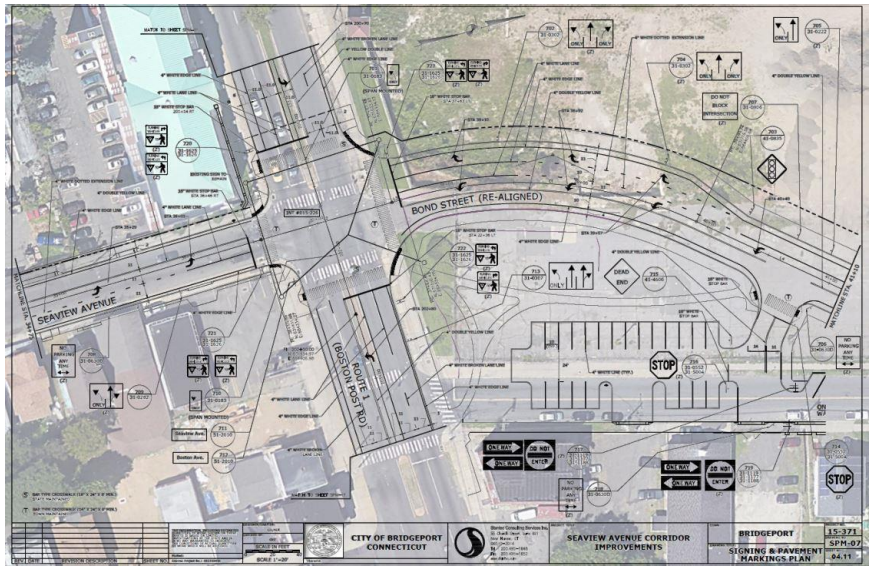


2 PRIOR EFFORTS IN STUDY AREA

2.1 Route 1 at Seaview Avenue Intersection Realignment

The City of Bridgeport, with technical and financial assistance from the CTDOT and the Federal Highway Administration (FHWA) are currently working on a project which will realign the intersection of Route 1, Seaview Avenue, and Bond Street in the study area. The project is underway and will create a four-way signalized intersection in place of the two offset intersections that currently exists. It is anticipated that this project will improve traffic flow and improve bicyclist and pedestrian visibility and safety when crossing Route 1. Crosswalks will be provided for at all approaches to the intersection. Exhibit 5 provides a plan view of the project which illustrates the realigned intersection.

Exhibit 5: Realigned Intersection at Route 1, Seaview Avenue, and Bond Street



2.2 CT Active Transportation Plan

The RSA study area was highlighted in the Connecticut Active Transportation Plan (2019) as a Pedestrian and Bicycle Safety Corridor. The Active Transportation Plan lists the RSA study area as priority seven in a list of the top ten safety corridors. The Active Transportation Plan proposed potential improvements with an estimated total cost of $13 million which included:

- Sidewalk and ramp upgrades to meet Americans with Disabilities Act (ADA) regulations
- Roadway resurfacing
- Traffic and pedestrian signal upgrades
- Selective full depth reconstruction
- Concrete curbing

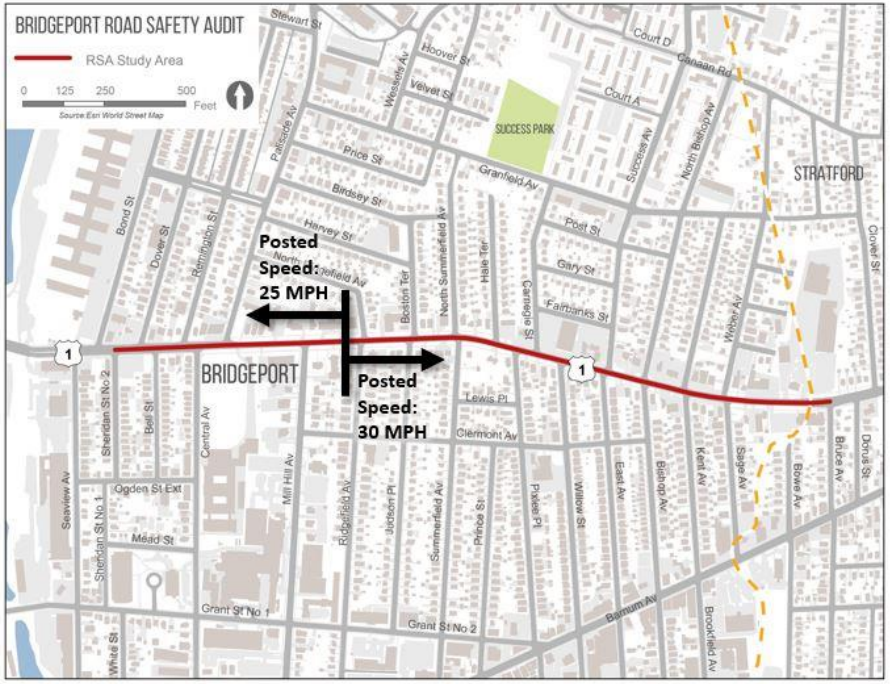
3 PRE-AUDIT MEETING

3.1 Pre-Audit Information

The RSA team conducted a pre-audit meeting in the afternoon of Tuesday, October 19, 2021. The RSA team presented a brief presentation that included an overview of the Bridgeport RSA goals and purpose, the study area, and key existing conditions findings. Key themes discussed during the pre-audit meeting are presented below.

Speeds: Speed limits in the study area range from 25 miles per hour (mph) west of Ridgefield Avenue and 30 mph east of Ridgefield Avenue. Exhibit 6 displays speed limits in the study area.

Exhibit 6: Study Area 85th Percentile Speeds

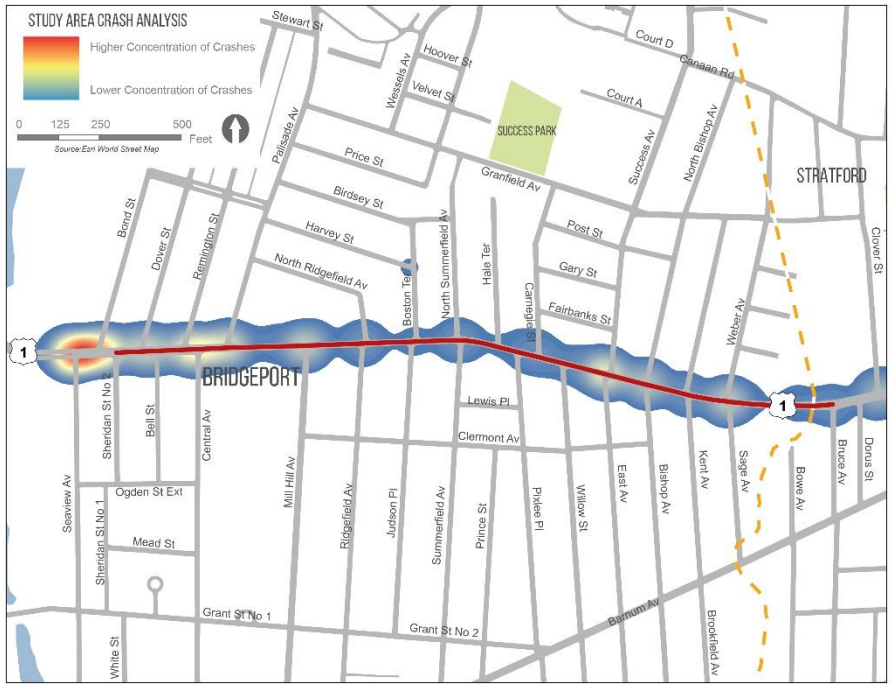


Crashes: Based on data retrieved from the Connecticut Crash Data Repository (CTCDR) for the five-year period between January 2016 through December 2020, there were a total of 672 crashes in the Bridgeport RSA study area. Crashes were concentrated in the vicinities of Seaview Avenue, Sheridan Avenue, and Bond Street; Remington Street, Central Avenue, and Palisade Avenue; East Avenue and Success Avenue; Mill Hill; and Sage Avenue and Weber Avenue. Exhibit 7 displays the study area crash summary and Exhibit 8 displays a study area crash heatmap.

Exhibit 7: Study Area Crash Summary

Year	Crash Severity					
	Fatal Injury	Serious Injury	Minor Injury	Possible Injury	No Apparent Injury, Property Damage Only	TOTAL
2016		6	22	22	85	135
2017	1		18	21	86	126
2018			17	32	86	135
2019	1	5	33	25	99	163
2020		1	28	18	66	113
TOTAL	2	12	118	118	422	672

Exhibit 8: Study Area Crash Heatmap



Crashes by Type: The most frequent crash type is a front-to-rear crash. These are "rear-end" crashes which are common in areas of stopped traffic such as an approach to an intersection, or in areas with many driveways. Other types of crashes including angle crashes and sideswipe same direction crashes which are common in areas with multiple lanes. Table 2 provides a breakdown of crashes by type. Exhibit 9 and Exhibit 10 display the location and breakdown of crashes by type in the corridor.

Exhibit 9: Crashes by Type

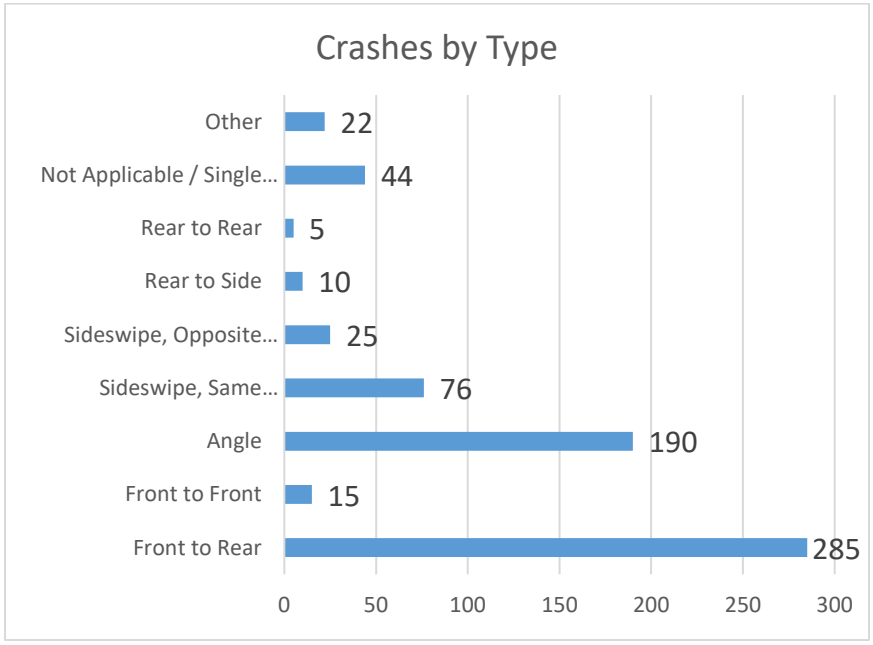
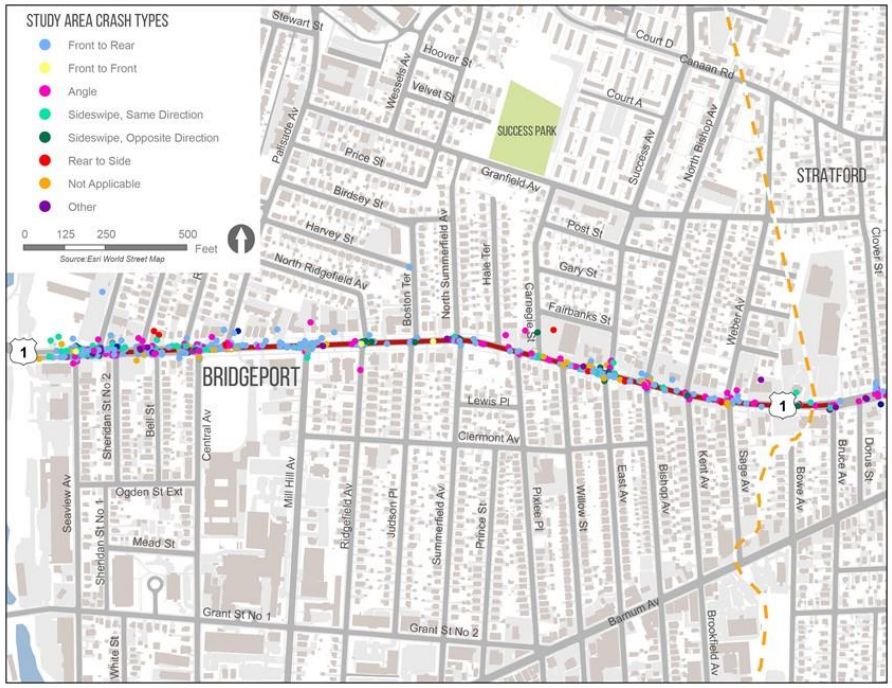


Exhibit 10: Crashes by Type



Crash Severity: There were two fatal crashes (pedestrians) and 12 serious injury crashes in the study area. Many crashes (422) are classified as property damage only. This is typical for rear end, "fender-bender" type crashes that are prevalent in the study area. Exhibit 11 and Exhibit 12 show crash severity by location and a summary of total crashes by severity.

Crashes by Involved Person: There were three crashes involving bicyclists in the Study Area. There were 16 crashes involving pedestrians in the Study Area, two of which resulted in fatalities. Exhibit 13 shows locations of crashes involving pedestrians or bicyclists.

Exhibit 11: Crash Severity by Location

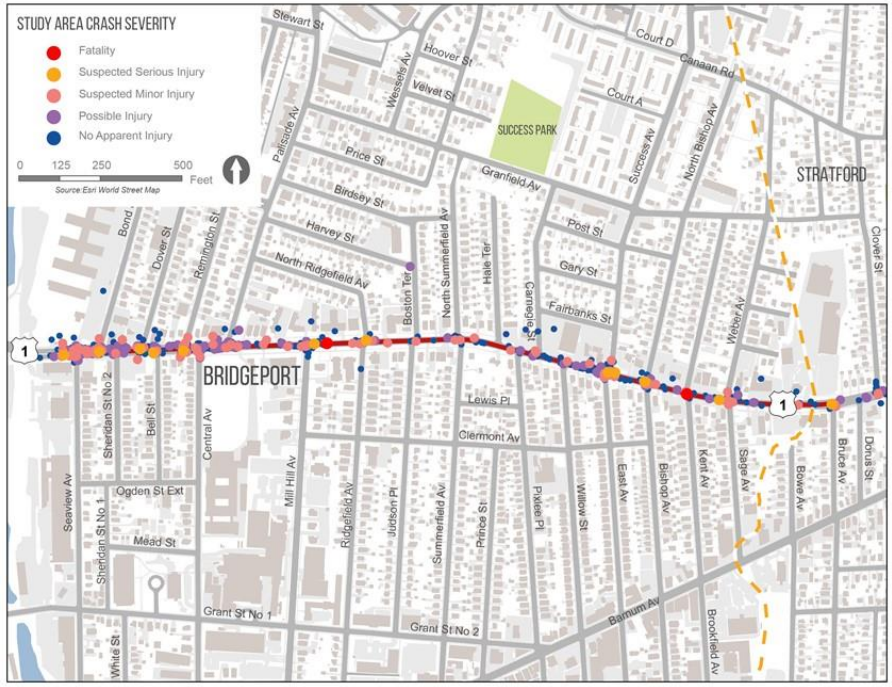


Exhibit 12: Crash Severity Summary

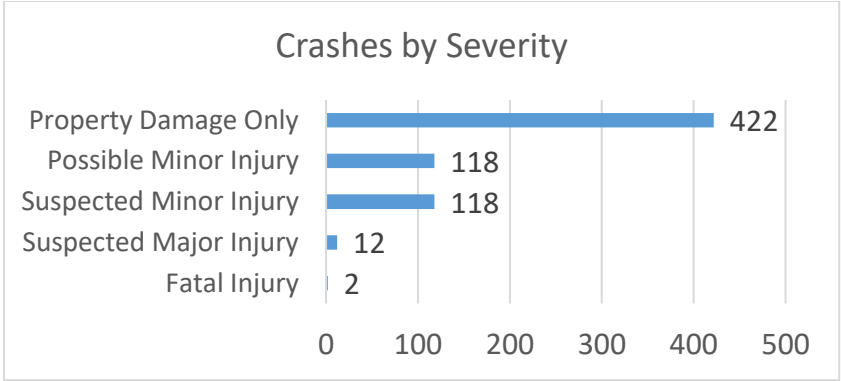


Exhibit 13: Crashes by Involved Person

3.2 Pre-Audit Discussion

Immediately following the pre-audit presentation, a discussion followed that highlighted concerns and notes regarding the Bridgeport RSA study area. Highlights from this discussion are presented below:

- Queuing and backups common at intersections in the study area. Particularly on the west end of the study area where traffic volumes are highest.
- Many of the traffic signals are older and do not have traffic detection or synchronization. In particular, the traffic signals at the intersection of East Avenue and Bishop Avenue were noted having significant queuing due to the lack of coordination between these two closely spaced intersections.
- Right-of-way (ROW) is wide in many locations; many areas between the street and sidewalk are paved and essentially serve as parking. This causes issues for pedestrians as there are many curb cuts.
- Parking movements need to be restricted.
- Sidewalks are generally in bad shape.
- Many high school students walk from Harding High School south to Route 1. Many other schools are located in the vicinity of the study area, but sidewalk conditions and crosswalks in the study area are not adequate.
- Participants of the call noted that the project area transects a neighborhood with approximately 40% households without access to a vehicle.
- CTDOT noted that many traffic signals in this corridor are planned to receive controller updates at an undetermined date, which would allow for improved coordination.

Sample slides from the pre-audit presentation are shown in Exhibit 14.

Exhibit 14: Sample slides from Pre-Audit Presentation

4 RSA ASSESSMENT

The following summary describes observations and discussion regarding issues and concerns throughout the Bridgeport RSA study area. Exhibit 15 shows RSA participants engaging in conversation during the RSA. Discussions were held at each of the noted locations below.

Exhibit 15: RSA participants during the RSA Assessment date

4.1 Intersection of Route 1 (Boston Avenue) and Bruce Avenue

- CTDOT noted that the signal at this location is newly replaced including new curb ramps, and crosswalks. The signal at this location includes an audible pedestrian signal (APS). See Exhibit 16.
- The pedestrian phase at this signal is an exclusive pedestrian phase.

Exhibit 16: New Signal at Route 1 at Bruce Avenue

4.2 Intersection of Route 1 (Boston Avenue) and Weber Street

- Difficult to distinguish curb cuts; curbs are short which makes it difficult to delineate roadway from parking area.
- Properties on northern side have inconsistent sidewalks through the middle of parking lots. Sidewalks are setback immediately behind parking in many of the properties, with a maneuvering space behind the sidewalk. While the sidewalks are within the ROW, property owners utilize ROW for parking and/or maneuvering to parking. See Exhibit 17.
- The sidewalk on the northern side lacks curb ramps.

Exhibit 17: Sidewalk setback away from roadway, behind parked cars in the ROW adjacent to 2115-2135 Boston Avenue (Insurance – Laundromat)

4.3 Intersection of Route 1 (Boston Avenue) and Kent Avenue

- The intersection does not have a sidewalk on the northern side of Route 1. There may be sufficient space within the ROW to install one.
- No crosswalks are present at this intersection.
- Curb ramps are located behind stop bars.
- Parking in the ROW between the roadway and the sidewalk (the buffer zone) is frequently observed in many of the properties to the south of Route 1. Many properties here have limited or no parking. Participants noted that no-parking signage is frequently removed by area residents and businesses. See Exhibit 18.
- Participants noted the potential for bicycle lane, which may help narrow roadway.

Exhibit 18: Cars parked in ROW between roadway and sidewalk (buffer zone) at 2044 Boston Avenue

4.4 Intersection of Route 1 (Boston Avenue) and North Bishop Avenue

- The signals at Success Avenue and Bishop Avenue are not coordinated, leading to unnecessary congestion due to the lack of coordination between signals (one will be green, while the other red).
- Traffic signal does not include pedestrian signal heads.
- Missing crosswalks on the southbound approach leg and westbound approach to this intersection.

4.5 Intersection of Route 1 (Boston Avenue) and Success Avenue

- The signals at Success Avenue and Bishop Avenue are not coordinated, leading to unnecessary congestion due to the lack of coordination between signals (one will be green, while the other red).
- Traffic signal does not include pedestrian signal heads.
- Intersection does not have crosswalks across Route 1 or the southbound approach (Success Avenue). See Exhibit 19.
- Parking in sidewalk area at 1917 Boston Avenue (Shell Gas Station) observed.

Exhibit 19: Missing crosswalk and confusing crossing environment at the intersection of Route 1 and Success Avenue

4.6 Intersection of Route 1 (Boston Avenue) and Willow Street

- Missing pedestrian sign in the Route 1 southbound direction (was knocked down at time of RSA).
- Curb ramp missing at southern curb.
- Damaged bus shelter at the westbound bus stop.
- Crossing was observed to be very difficult during RSA assessment period. There are many dead trees and hanging limbs near the intersection. See Exhibit 20.

Exhibit 20: Crosswalk at Willow Street

4.7 Intersection of Route 1 (Boston Avenue) at Pixlee Place

- Carnegie Avenue has a left-turn lane in the Route 1 northbound direction. This is the only left-turn lane in this area of the study area.
- Hale Terrace was noted by RSA participants as the western edge of the commercial area with the starting extent near Bruce Avenue.

4.8 Intersection of Route 1 (Boston Avenue) and North Summerfield

- Missing curb ramp on southwest corner.
- No crosswalks on any approach.
- Bus stops are separated from sidewalk without any clear accessible pathway. Riders were observed waiting for the bus in the grass buffer between the roadway and the sidewalk.
- Sidewalk on the northern side of Route 1 was observed to be in poor condition in some areas. See Exhibit 21.

Exhibit 21: Sidewalk in poor condition on the north side of Route 1

4.9 Intersection of Route 1 (Boston Avenue) and Boston Terrace

- No crosswalks on any approach.
- Stop bar at Boston Terrace is poorly located, drivers often roll past where pedestrians cross.
- Bus stops are separated from sidewalk without any clear accessible pathway. Riders were observed waiting for the bus in the grass buffer between the roadway and the sidewalk. See Exhibit 22.
- Sidewalk on the northern side of Route 1 was observed to be in poor condition in some areas.
- When buses stop, cars often try and pass by getting partially in the opposing travel lane.
- Stop bars are inconsistently placed relative to crosswalk.

Exhibit 22: Transit rider waiting for Greater Bridgeport Transit (GBT) Route 15 bus at Route 1 and Judson Place. Note the limited accessibility at the bus boarding location and the lack of connection to the sidewalk

4.10 Intersection of Route 1 (Boston Avenue) and Ridgefield Avenue

- No crosswalk on the southbound approach.
- Crosswalk across Route 1 does not have curb ramp on north landing. Southern curb ramp does not meet ADA standards.
- Overhead flashing beacon is inoperable. Representatives from the City of Bridgeport and CTDOT indicated the beacon has been inoperable for approximately nine years. See Exhibit 23.
- Stop bars are inconsistently placed relative to crosswalk.

Exhibit 23: Inoperable flashing beacon at Ridgefield Avenue

4.11 Intersection of Route 1 (Boston Avenue) and Mill Hill Avenue

- Crosswalk across Route 1 (eastbound approach) does not have a curb ramp on northern curb and does not have an accessible curb ramp on the southern curb. See Exhibit 24.
- Pedestrian push button on the southwest corner is broken.
- Pedestrian signals not clearly illuminated on the eastbound approach. Sun glare makes it difficult to tell which indication is illuminated. CTDOT representatives stated these signal heads will get transitioned to light emitting diode (LED) signal heads in the future.
- Bus stops are separated from sidewalk without any clear accessible pathway. Riders were observed waiting for the bus in the grass buffer between the roadway and the sidewalk.
- Drivers were observed to turn right-on-red without stopping or yielding.
- RSA participants from the city noted that school pick up in this area frequently occurs on Route 1.

Exhibit 24: Crosswalk at Mill Hill Avenue

4.12 Intersection of Route 1 (Boston Avenue) and Palisade Avenue

- The sidewalk on the northeast corner has a very steep incline to the intersection.
- No crosswalks on any approach.
- No pedestrian signal heads are provided at this intersection.
- Stop bar on the Route 1 southbound approach is set far back.
- The intersection works with the Central Avenue intersection as an offset intersection. There are high turning volumes. Participants of the RSA generally agreed it was difficult to tell when it was safe to cross the side streets at this intersection. See Exhibit 25.
- Higher traffic speeds were observed going downhill (Route 1 southbound).

Exhibit 25: Turning traffic at Palisade Avenue

4.13 Intersection of Route 1 (Boston Avenue) and Central Avenue / Remington Street

- Parking for 1439-1455 Boston Avenue is adjacent to sidewalk on northern side of Route 1. Vehicles must back out onto the sidewalk when leaving the property.
- Difficult to determine where curb cuts are located.
- No pedestrian signal heads are provided at this intersection.
- No crosswalk across Central Avenue.
- Poor sidewalk conditions located throughout this area. See Exhibit 26.
- Stop bar set too far back at intersection and sidewalk is offset.

Exhibit 26: Sidewalks in poor condition in the vicinity of Central Avenue

4.14 Route 1 (Boston Avenue) between Remington Street and Sheridan Street

- Some properties in this area have parking that requires drivers to back up into Boston Road when leaving front-in parking spaces.
- Cars were observed utilizing sidewalk and ROW area to park cars. See Exhibit 27.
- U-turns common on Route 1 at Sheridan Street due to median.
- Missing crosswalks across all side streets in this area.

Exhibit 27: Parked vehicles on-sidewalk in the vicinity of Dover Street

5 RECOMMENDATIONS

Based on the findings discussed during the RSA, the RSA team compiled a set of recommendations for the study area. These recommendations are organized by study area location. During the RSA, participants agreed the study area was characterized largely by three distinct sections. These sections were defined as:

- Route 1 - Bruce Avenue to Hale Terrace
- Route 1 - Hale Terrace to Palisade Avenue
- Route 1 - Palisade Avenue to Sheridan Street.

All recommendations for all locations are divided into short-term, medium-term, and long-term recommendations.

- Short-term recommendations: These are improvements that are simpler and could be completed on a quick timeline. These recommendations are low-cost alternatives such as striping and signage. These recommendations generally do not require extensive engineering or construction costs. More extensive recommendations which have funding previously committed may be included. These projects are defined as those that may be complete within two years.
- Medium-term recommendations: These are improvements that may require more substantial engineering than those generally included as short-term recommendations. These may require establishment of funding in capital improvement plans, or a dedicated funding item. However, these recommendations are generally simpler than long-term recommendations and generally do not include ROW acquisition etc. These projects are defined as those that may be completed in two-to-five years.
- Long-term recommendations: These are improvements that require substantial study and engineering. These recommendations generally require significant funding for implementation and may require several years of planning to budget. These projects are defined as those recommendations that may take five years or longer to complete.

It should be noted that any work within the State ROW to be done by non-State forces will require an encroachment permit from the District 3 Permit Office and/or an official request from the Bridgeport Local Traffic Authority.

5.1 Bruce Avenue to Hale Terrace

Route 1 between Bruce Avenue to Hale Terraces is currently characterized by a two-lane roadway, with 40-foot curb-to-curb width and an approximately 100-foot ROW width. The roadway includes two 15-foot travel lanes and 5-foot shoulders on either side of the roadway. Adjacent properties in this area are mostly commercial, and access concerns to parking areas were noted throughout the RSA assessment. The recommendations included for this section focus on creating a safer pedestrian environment through several interventions. Providing safer crossings across Route 1 and all side streets are prioritized. Providing crossings at Route 1 in regular intervals through this corridor is also a priority, as well as a recommendation to locate the sidewalk outside the area for parking movements.

Short-term

1) Consider striping new crosswalks across all side streets in study area. Prioritize crosswalks across side streets with significant traffic and/or crash history. This could include new side street crossings at Kent Avenue, Sage Avenue, Weber Street, and Bruce Avenue.
2) Install and/or replace all curb ramps in study area not up to ADA standards (if present). See Exhibit 28 for an example an ADA compliant curb ramp.
3) Coordinate traffic signals at East Avenue and Bishop Avenue.
4) Restripe roadway to include (refer to Exhibit 29 for a similar roadway configuration):
    a) 2 x 11-foot travel lanes
    b) 12-foot center turn lane
    c) 2-foot shoulders
5) Repair damaged bus shelter at Route 1 and Willow Street in the southbound direction

Medium-term

1) In collaboration with GBT, review bus stop locations and address accessibility concerns to all bus stops in study area. Consider the following:
    a) At Route 1 and Bruce Avenue: Adding bus shelters and including a landing for the bus stop in the southbound direction
    b) At Route 1 and Sage Avenue: Adding a landing for the bus stop in the northbound direction
    c) Relocate and consolidate the bus stop at Route 1 and Willow Avenue to Route 1 and East Avenue. Add bus shelters to the relocated bus stop at East Avenue.
2) Rehabilitate all deteriorated sidewalk in study area. Coordinate rehabilitation of sidewalk with roadway reconstruction efforts.
3) Install pedestrian signal heads and crosswalks on all approaches at Bishop and East Avenue signals. Coordinate work on traffic signal equipment with roadway reconstruction efforts.
4) Request that DOT-Traffic review feasibility of installation of crosswalk across Route 1 at Sage Avenue.
5) Request that DOT-Traffic review feasibility of relocation of crosswalk at Willow Street to Pixlee Place. Relocation provides consistent crosswalk spacing between the existing crosswalk at Ridgefield Avenue and the recommended crosswalk at the existing traffic signal at East Avenue. Install pedestrian refuge island opposite to Route 1 southbound left-turn lane to Pixlee Place. Request that DOT-Traffic review feasibility of installation of rapid-rectangular flashing beacon

(RRFB). Refer to Exhibit 30 and Exhibit 31 for an example of a pedestrian refuge island and an RRFB.

Long-term

1) Reconstruct roadway to include:
   a) 2 x 11-foot travel lanes
   b) 12-foot center turn lane
   c) 2 x 5-foot shoulder / bicycle lane
   d) 8-foot parking on southern curb
   e) 10-foot sidewalks / shared use path on southern curb
   f) Relocated sidewalk to northern curb line
   g) Relocated parking aisle north of proposed sidewalk
2) Install curb extensions on all major intersections and with intersections with crosswalks across Route 1.
3) Close redundant driveways on Route 1 with preference for side street driveway locations.

Exhibit 32 displays general recommendations for the study area while Exhibit 33 displays detailed recommendations for Route 1 between East Avenue and Weber Street including long-term recommended plans.

Exhibit 28: Example of ADA-accessible curb ramp

Exhibit 29: Example of road diet configuration on Silver Lane in East Hartford, similar to the lane configuration proposed

Exhibit 30: Example of how a pedestrian refuge island may be configured at Pixlee Place opposite a left-turn lane

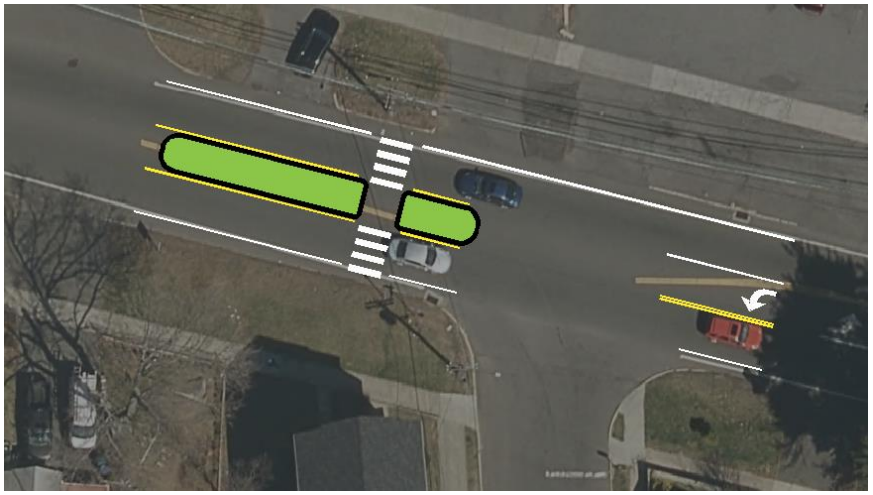
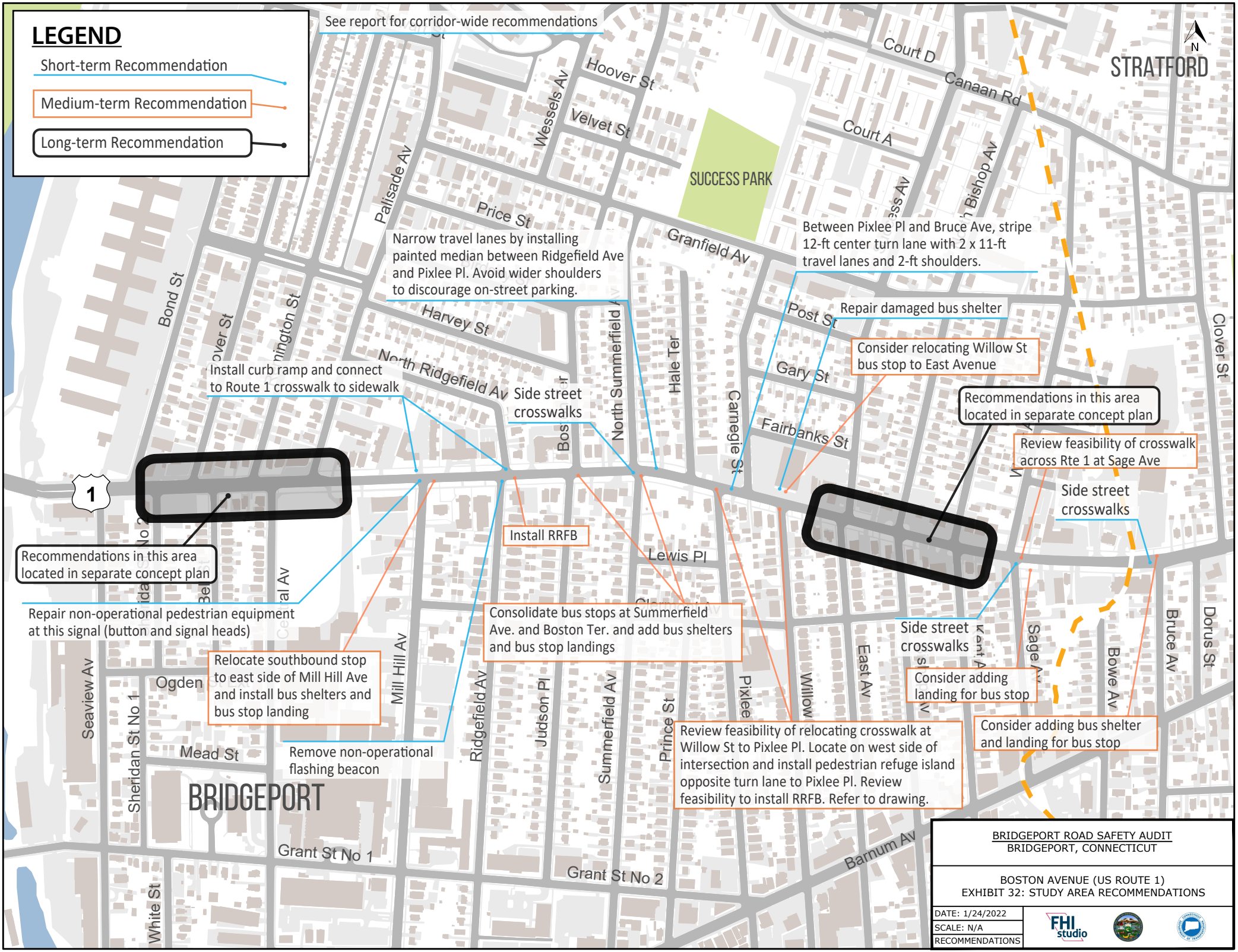


Exhibit 31: Example of RRFB (Source: CTDOT)


LEGEND
Short-term Recommendation
Medium-term Recommendation
Long-term Recommendation
See report for corridor-wide recommendations
Narrow travel lanes by installing painted median between Ridgefield Ave and Pixlee Pl. Avoid wider shoulders to discourage on-street parking.
Between Pixlee Pl and Bruce Ave, stripe 12-ft center turn lane with 2 x 11-ft travel lanes and 2-ft shoulders.
Repair damaged bus shelter
Consider relocating Willow St bus stop to East Avenue
Recommendations in this area located in separate concept plan
Review feasibility of crosswalk across Rte 1 at Sage Ave
Side street crosswalks
Install curb ramp and connect to Route 1 crosswalk to sidewalk
Side street crosswalks
Install RRFB
Recommendations in this area located in separate concept plan
Repair non-operational pedestrian equipment at this signal (button and signal heads)
Consolidate bus stops at Summerfield Ave. and Boston Ter. and add bus shelters and bus stop landings
Relocate southbound stop to east side of Mill Hill Ave and install bus shelters and bus stop landing
Side street crosswalks
Consider adding landing for bus stop
Remove non-operational flashing beacon
Review feasibility of relocating crosswalk at Willow St to Pixlee Pl. Locate on west side of intersection and install pedestrian refuge island opposite turn lane to Pixlee Pl. Review feasibility to install RRFB. Refer to drawing.
Consider adding bus shelter and landing for bus stop
STRATFORD
BRIDGEPORT
SUCCESS PARK
Court D
Canaan Rd
Court A
Hoover St
Velvet St
Wessels Av
Palisade Av
Price St
Granfield Av
Bond St
Harvey St
North Ridgefield Av
Post St
Gary St
Fairbanks St
Hale Ter
Carnegie St
North Summerfield Av
Clover St
Lewis Pl
Mill Hill Av
Ridgefield Av
Judson Pl
Summerfield Av
Prince St
Pixlee
Willow
East Av
Bowe Av
Bruce Av
Dorus St
Sage Av
Seaview Av
Sheridan St No 1
Ogden
Mead St
Grant St No 1
Grant St No 2
Barnum Av
White St
1
BRIDGEPORT ROAD SAFETY AUDIT
BRIDGEPORT, CONNECTICUT
BOSTON AVENUE (US ROUTE 1)
EXHIBIT 32: STUDY AREA RECOMMENDATIONS
DATE: 1/24/2022
SCALE: N/A
RECOMMENDATIONS
FHI studio

LEGEND

- Short-term Recommendation
- Medium-term Recommendation
- Long-term Recommendation

Crosswalks on all legs.
Install pedestrian signal heads.

Potential bus shelter location.
Relocate bus stop from Willow Ave

5-ft shoulder / bike lane

Center turn lane

Potential bus shelter location.
Relocate bus stop from Willow Ave

8-ft parking

5-ft shoulder / bike lane

Coordinate East Ave and
Bishop Ave signals

Curb extensions on all major
intersections and with intersections
with crosswalks across Route 1

Crosswalks on all legs.
Install pedestrian signal heads.

Consider additional landscaping
where feasible

Maintain northern curb line

Align sidewalk inside parking

Close driveway

Side street crosswalks

10-ft sidewalk / shared use path

BOSTON AVENUE

NORTH BISHOP AVENUE

KENT AVENUE

EAST AVENUE

BISHOP AVENUE

1

N

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

BRIDGEPORT ROAD SAFETY AUDIT
BRIDGEPORT, CONNECTICUT

BOSTON AVENUE (US ROUTE 1)
EAST AVE - WEBER ST CONCEPT PLAN

DATE: 1/24/2022	
SCALE: 1" = 50'	
CONCEPT	

FHI studio

5.2 Hale Terrace to Palisade Avenue

Hale Terrace to Palisade Avenue was defined primarily by its more multi-family and institutional land uses in this segment. Vehicular turning movements and pedestrian activity to adjacent land uses were present, but notably less than other segments in the study area. Capital Preparatory Harbor Lower School located at the intersection of Mill Hill Avenue drove much of the activity in this segment. Recommendations here include strategies to reduce vehicular speeds with lane width narrowing. Additional recommendations include sidewalk rehabilitation and improvements to all crossings and bus stops to ensure their accessibility. In particular, this section had bus stops without accessible pathways to the sidewalk. It is recommended that stakeholders meet with GBT to eliminate bus stops where feasible and improve remaining stops to improve their accessibility.

Short-term

1) Consider striping new crosswalks across all side streets in study area. Prioritize crosswalks across side streets with significant traffic and/or crash history. This could include new side street crossings at Summerfield Avenue, and North Summerfield Avenue.
2) Install and/or replace all curb ramps in study area not up to ADA standards (if present).
3) Remove non-operational flashing beacon at Ridgefield Avenue.
4) Repair non-operational pedestrian equipment at the traffic signal at Route 1 and Mill Hill Avenue.
5) Install curb ramps at existing crosswalks across Route 1 at Mill Hill Avenue and Ridgefield Avenue.
6) Narrow Route 1 travel lanes to 11-feet by installing painted median between Ridgefield Avenue and Pixlee Place. Avoid wider shoulders to discourage on-street parking. Refer to Exhibit 34 for an example of travel lane narrowing with the installation of a painted median.

Medium-term

1) In collaboration with GBT, review bus stop locations and address accessibility concerns to all bus stops in study area. Consider the following:
    a) Consolidate the bus stop at Boston Terrace and Summerfield Avenue. At the desired location add bus shelters and bus stop landings.
    b) At Route 1 and Mill Hill Avenue: Install bus shelters and landing for the bus stops. Relocate southbound stop location to near-side (east of the intersection of Mill Hill Avenue) and consolidate southbound bus stop for Route 23 on Mill Hill Avenue to the same location.
2) Rehabilitate all deteriorated sidewalk in study area. Coordinate rehabilitation of sidewalk with roadway reconstruction efforts.
3) Request that DOT-Traffic review feasibility of installation of rapid-rectangular flashing beacon (RRFB) at Ridgefield Avenue.
4) Remove dead trees and overhanging limbs and replant with appropriate species for site based on *Right Tree, Right Place Standards* published by CT DEEP.

Long-term

1) Consider streetscape improvements to relocate pedestrian side street crossings closer to Route 1 and to incorporate additional landscaping elements.

Exhibit 32 displays general recommendations for the study area including Route 1 between Hale Terrace to Palisade Avenue.

Exhibit 34: Example of travel lane narrowing with the installation of a painted median (Source: Federal Highway Administration)

5.3 Palisade Avenue to Sheridan Street

Route 1 between Palisade Avenue and Sheridan Street is the busiest segment of Route 1 in the study area. This segment is anchored by the intersection of Seaview Avenue to the western extent, which is currently in redesign to realign Seaview Avenue and Bond Streets (and not included in this study). The plans for the on-going redesign project is included in the Appendix. To the east is the offset intersection between Central Avenue and Palisade Avenue. Route 1 in this area is a four-lane roadway with active commercial uses on either side of Route 1. Much traffic was observed in this area using Route 1 in a dog-leg pattern to navigate many of the offset streets to the north and south of this area. These dog-leg movements led to high turning movements which made it difficult for pedestrians to cross. Recommendations in this area focus on improving pedestrian safety crossing Route 1, improving sidewalks throughout this area, and eliminating the need for dog-leg traffic movements which RSA participants noted added to overall pedestrian stress in this area.

Short-term

1) Consider striping new crosswalks across all side streets in study area. Prioritize crosswalks across side streets with significant traffic and/or crash history. This could include new side street crossings at Sheriden Street, Dover Street, Bell Street, Remington Street, Central Avenue, and Palisade Avenue.
2) Install and/or replace all curb ramps in study area not up to ADA standards (if present).
3) Enforce pedestrian zone and remove vehicles parked within the sidewalk in the right-of-way at 1347 Boston Avenue, 1367 Boston Avenue, 1379 Boston Avenue and other properties on Route 1 in this area.
4) Restripe Route 1 in this area to match Seaview Avenue project including 4-foot northbound shoulder and 1-foot southbound shoulder with 11-foot travel and turn lanes in this area.

Medium-term

1) In collaboration with GBT, review bus stop locations and address accessibility concerns to all bus stops in study area. Consider the following:
    a) At Bell Street: Add a bus shelter to the northbound bus stop
    b) Locate a southbound bus stop in this area. Consider locating a southbound bus stop near Remington Street.
2) Rehabilitate all deteriorated sidewalk in study area. Coordinate rehabilitation of sidewalk with roadway reconstruction efforts.
3) Relocate crosswalk east of Central Avenue to east of Palisade Avenue to avoid conflict with high-volume turning movements between Central Avenue and Palisade Avenue.
4) Install pedestrian signal heads at the intersections of Central Avenue and Palisade Avenue. Due to high-turning movements in this area, consider exclusive pedestrian phasing. Coordinate work on traffic signal equipment with roadway reconstruction efforts.
5) Close Route 1 driveways to parking lot located at Route 1 and Sheridan Street.

Long-term

1) Evaluate the feasibility and benefits of realigning Route 1 and Central Avenue and Route 1 and Palisade Avenue utilizing property from the former Harding High School. Install crosswalks and pedestrian signal heads on all legs. Configure local access for properties located between 1875 – 1905 Central Avenue.

2) Evaluate need for second Route 1 southbound lane due to simplified traffic operations from signal realignment. If feasible, utilize width for shoulder, bicycle lane, and/or on-street parking in this area.
3) Consider landscaped median to prohibit left-turns from Dover Street, Bell Street and Remington Street.
4) Consider streetscape design elements in this area to include decorative lighting, surface materials, landscaping, and pedestrian amenities such as seating. Refer to Exhibit 35 for an example of streetscape design elements constructed in Hartford, CT.

Exhibit 32 displays general recommendations for the study area while Exhibit 36 displays detailed recommendations for Route 1 between Palisade Avenue to Sheridan Street.

Exhibit 35: Example of streetscape elements installed on Route 44 in Hartford, CT (Source: CTDOT)

LEGEND

- Short-term Recommendation
- Medium-term Recommendation
- Long-term Recommendation

DOVER STREET

REMINGTON STREET

PALISADE AVENUE

BOSTON AVENUE

BELL STREET

CENTRAL AVENUE

FORMER HARDING HIGH SCHOOL
(CITY OF BRIDGEPORT OWNED)

N

1

Realign Central Ave to Palisade Ave utilizing City of Bridgeport property (alignment shown for illustrative purposes only).

Rehabilitate sidewalks in all areas

Crosswalks on all legs of intersection. Install pedestrian signal heads.

Consider southbound bus stop in this area

Evaluate need for second Route 1 southbound lane due to simplified traffic operations from signal realignment. If feasible, utilize width for shoulder / bike lane and/or on-street parking in this area.

Side street crosswalks

Enforce pedestrian zone and remove vehicles parked in sidewalk

11-ft travel and turn lanes

Install bus shelter

Close driveways to parking lot and utilize existing driveways on Sheridan St

Optional: Central landscaped median to prohibit left-turns from side streets

Consider streetscape design elements on Boston Avenue (Rte 1) in this area

Configure local access to properties from Central Avenue in this area

Restripe Route 1 in this area to match Seaview Avenue project including 4-foot northbound shoulder and 1-foot southbound shoulder with 11 foot travel and turn lanes. Refer to design plans in the appendix.

Relocate crosswalk east of Central Ave to east of Palisade Ave to avoid high-volume turning movements. Install pedestian signal heads and consider exclusive pedestrian phase due to turning movements in this area.

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

BRIDGEPORT ROAD SAFETY AUDIT
BRIDGEPORT, CONNECTICUT

BOSTON AVENUE (US ROUTE 1)
SHERIDAN ST - PALISADE AVE CONCEPT PLAN

DATE: 1/24/2022	
SCALE: 1" = 50'	
CONCEPT	

FHI studio

6 SUMMARY

This report documents the observations, discussions, and recommendations developed during the completion of the City of Bridgeport's RSA. It provides the City with an outlined strategy to improve the transportation network for all users in the study area, particularly focusing on pedestrians and cyclists. Moving forward, the City of Bridgeport and CTDOT may use this report to prepare strategies for funding and implementing the improvements. This report provides Bridgeport with a toolkit to plan for including these multi-modal recommendations into future development within the study area.

The aforementioned Community Connectivity Program: Road Safety Audit Report is an objective review intended for the municipality use to help assess the existing conditions within a predetermined area of town selected by the municipality. The conclusions of this report are advisory and intended for general planning purposes to help identify bicycle, pedestrian and non-motorized transportation needs that encourage walking and bicycling, as well as assists in developing recommendations to improve the existing conditions. The contents of this report are not intended to be legally binding, but rather offer recommendations to improve safety in the vicinity of the audit location and create a more appealing transportation alternative.

APPENDICES

A: Pre-Audit Presentation

B: Walk Audit Materials

BRIDGEPORT ROAD SAFETY AUDIT

ROUTE 1: SHERIDAN STREET TO BRUCE AVENUE

CONNECTICUT DEPARTMENT OF TRANSPORTATION 125 1895 - 2020

SEAL OF THE CITY OF BRIDGEPORT, CONNECTICUT INCORPORATED 1836

COMMUNITY connectivity program

FHI studio

NOVEMBER 2021

INTRODUCTIONS

AGENDA

1. Welcome and Team Introductions
2. Study Purpose and Goals
3. Study Area
4. Review of Site-Specific Data and Issues
5. Next Steps for Tomorrow’s Site Visit Audit

PROJECT TEAM

- Connecticut Department of Transportation (CTDOT) is sponsoring
- City of Bridgeport
- FHI Studio is conducting the Road Safety Audit reporting
- Support from MetroCOG

PURPOSE AND GOALS OF THE ROAD SAFETY AUDIT

Safety assessment of existing walking and biking routes

Improve transportation network for all users by making conditions safer and more comfortable for pedestrians and cyclists

Identify the issues that may discourage or prevent walking and bicycling

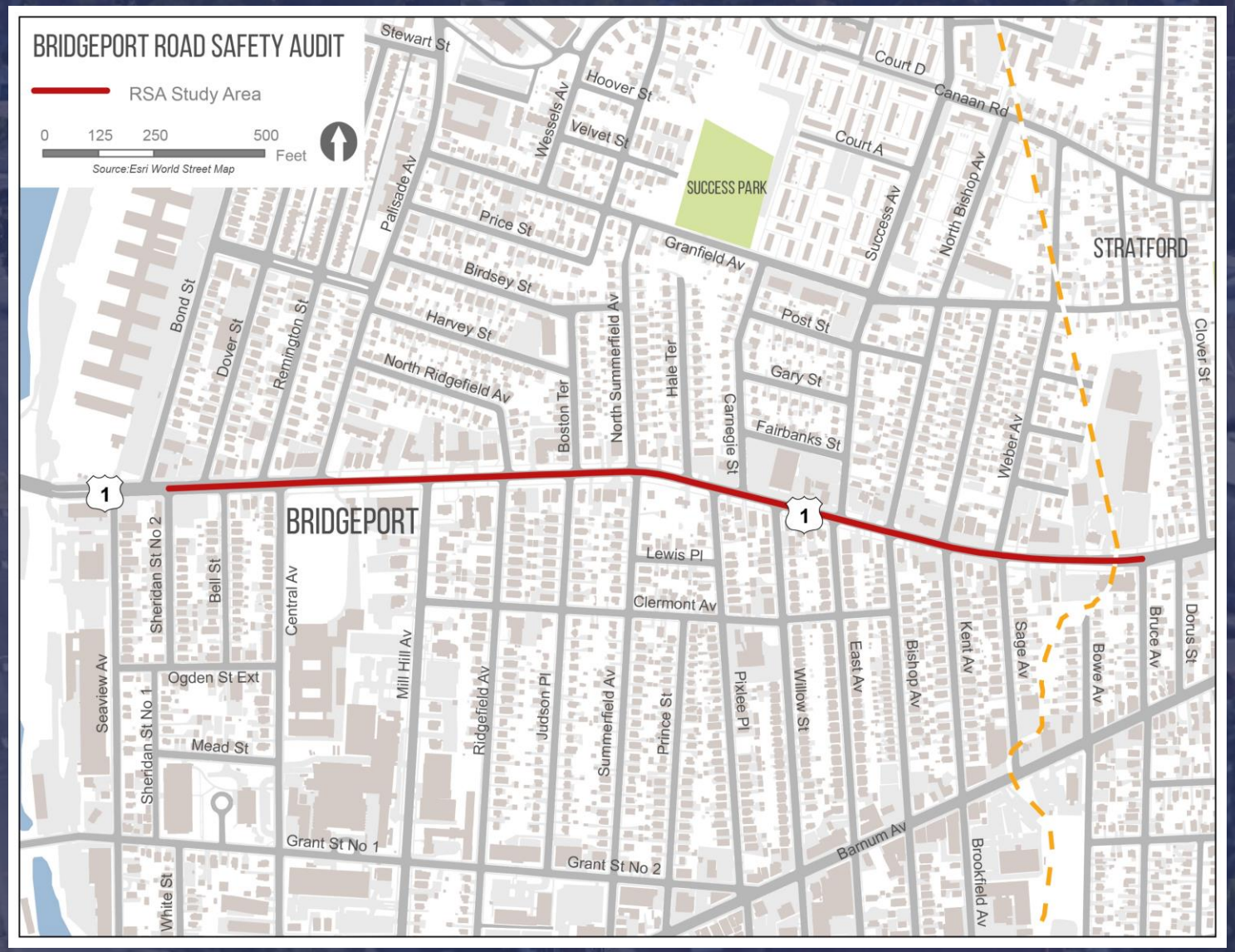
Identify next steps, evaluate feasibility of proposed improvements, and potential funding sources.

DELIVERABLES

- Existing Conditions Data Collection
- Pre-Audit Meeting
- Field Audit
- Post Audit Meeting
- Road Safety Audit Report

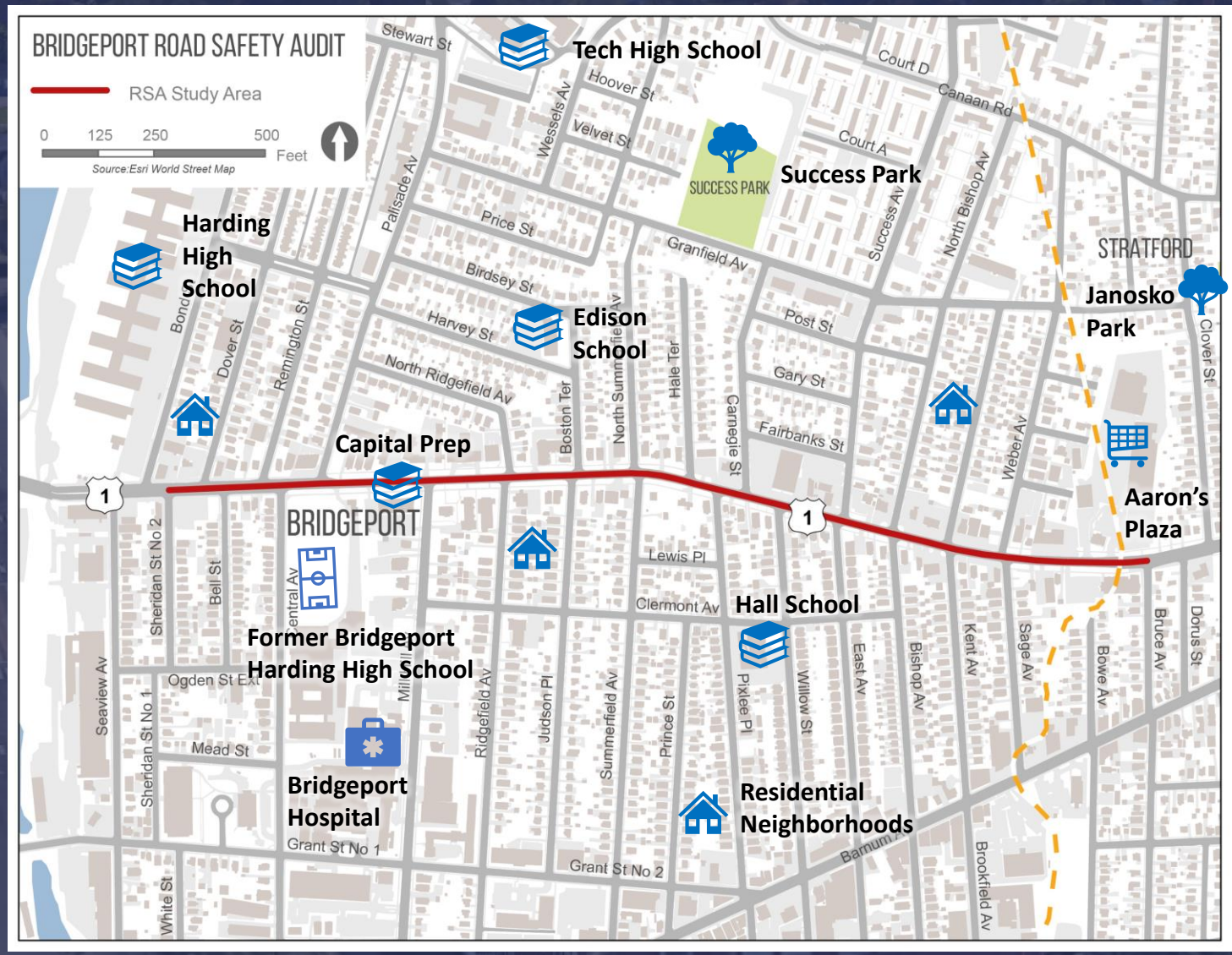
STUDY AREA

- Route 1 (Boston Avenue) between Sheridan Street and Stratford Town Line (Bruce Avenue)



POINTS OF INTEREST

- Bridgeport Hospital
- Capital Prep, Harding High School, Hall School, Edison School, Tech High School
- Success Park, Janosko Park (Stratford)
- Former Harding High School
- Aaron's Plaza, Commercial Businesses
- Residential Neighborhoods



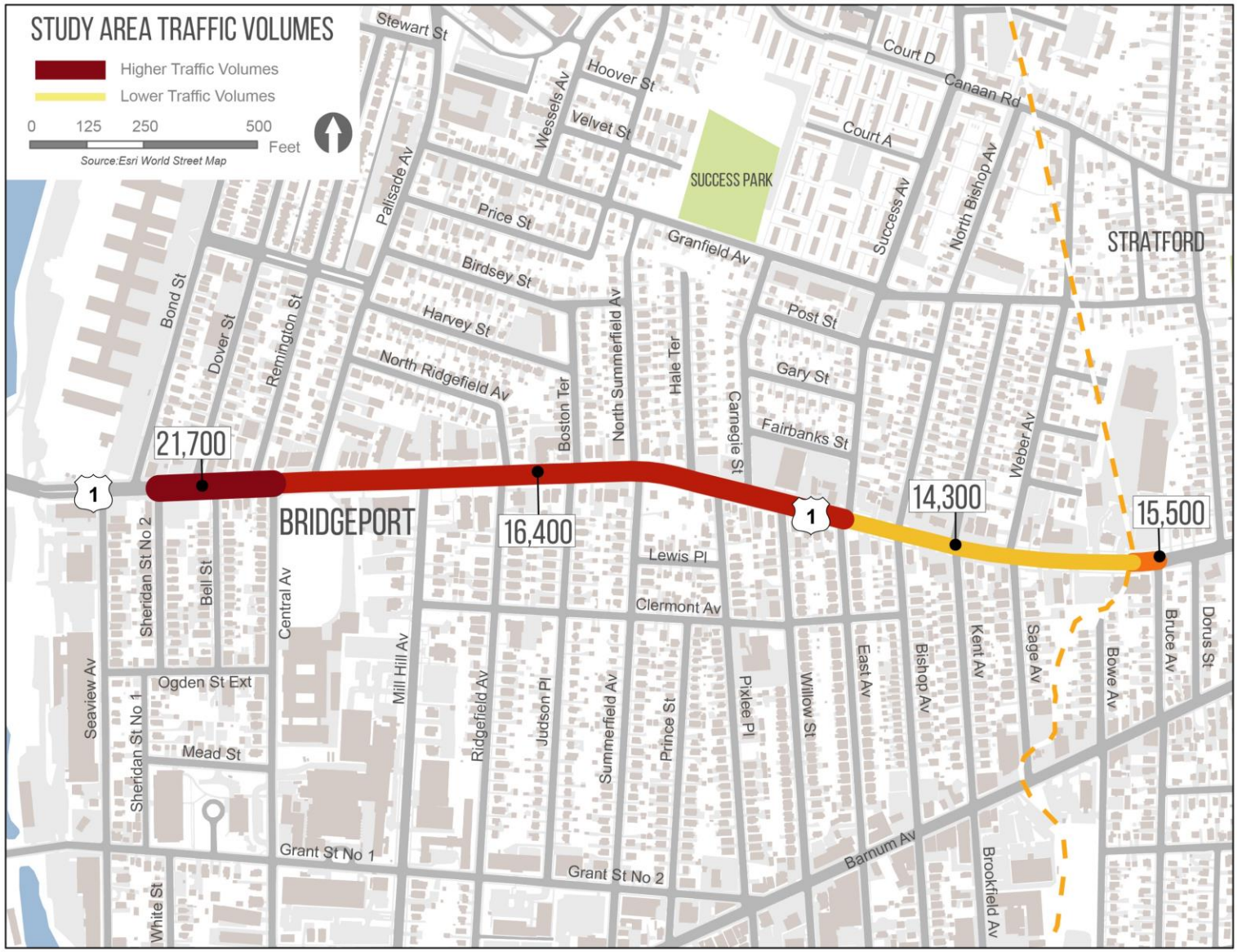
EXISTING CONDITIONS FINDINGS

Routes 1 serves many purposes including:

- Local and regional truck traffic
- Local residential access
- Employment commuting
- Local business access
- Restaurants/ Town Center uses
- Access to points throughout Bridgeport/Stratford areas
- Pedestrian movement to serve local neighborhoods

TRAFFIC VOLUMES

- Higher traffic volumes heading west on Route 1 towards central Bridgeport
  - Highest volumes between Sheridan Street and Central Avenue

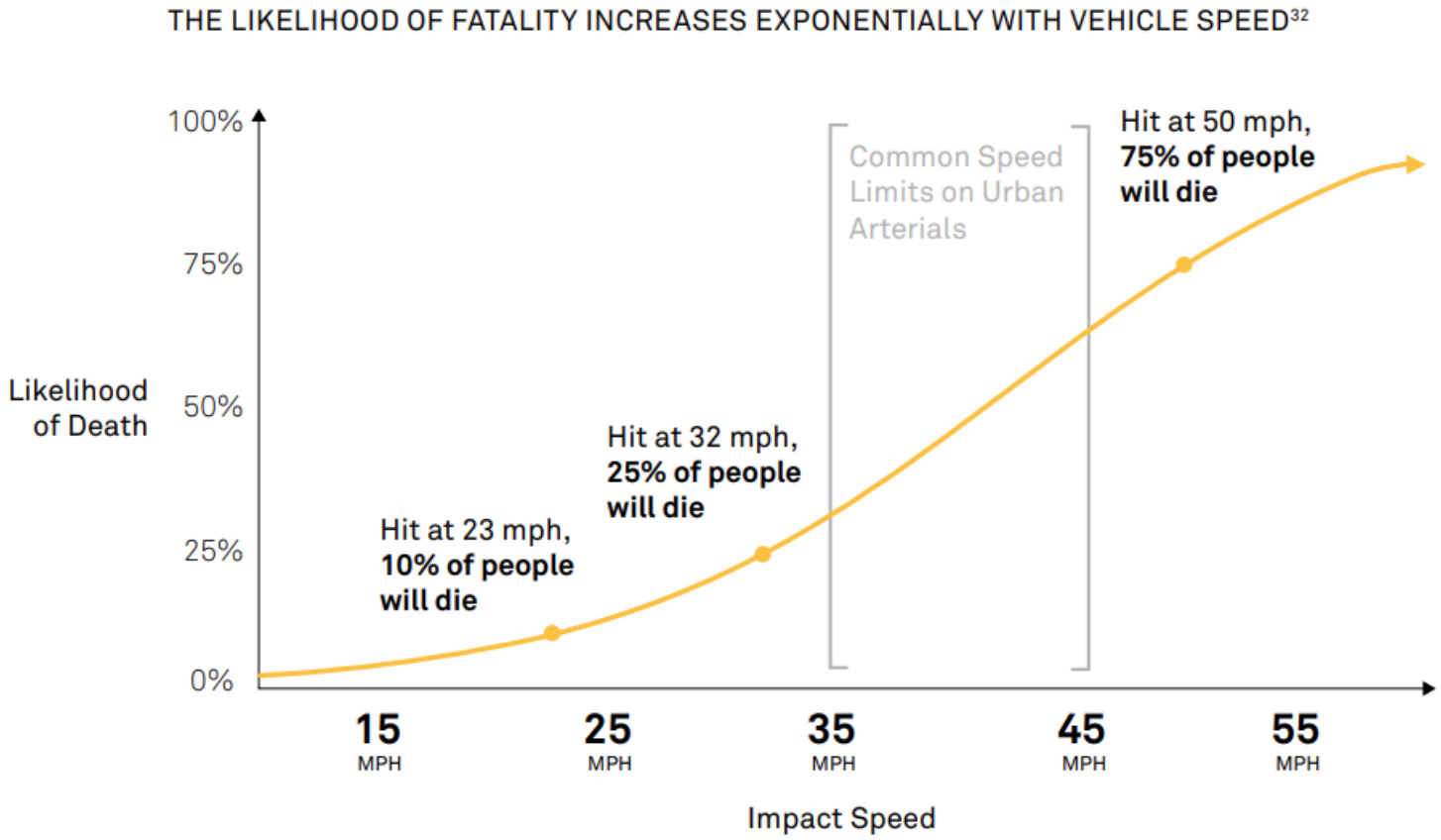


TRAFFIC SPEED LIMITS

- Speed limit in Study Area is between 25 MPH west of Ridgefield Avenue and 30 MPH east of Ridgefield Avenue

SPEEDS IN CONTEXT

- Higher speeds are more dangerous for pedestrians



NACTO *City Limits*

ROADWAY GEOMETRY

Bridgeport - RSA - Route 1
Street Inventory

Road	From	To	Distance	Direction	Lanes	Lane Width	Sidewalk Type	Sidewalk Width	Sidewalk Condtion	ADA Ramps Present	ADA Ramps Compliant	Curb	Parking	Shoulder	Notes
Boston Avenue (Route 1)	Sheridan Street	Central Avenue	500'	NB	2	12'	Concrete	5' min	Poor	No	No	Paved	N/A	N/A	7' landscaped median
				SB	2	12'	Concrete	4' min	Poor	Yes	No	Paved	N/A	N/A	Curb ramp missing on Sheridan St.
Boston Avenue (Route 1)	Central Avenue	Palisade Avenue	150'	NB	1	20'	Concrete	9'	Good	N/A	N/A	Concrete	N/A	4'	
				SB	2	12'	Concrete	5'	Fair	Yes	No	Paved	N/A	3'	
Boston Avenue (Route 1)	Palisade Avenue	150 ft W/O Mill Hill Avenue	300'	NB	1	12'	Concrete	9'	Good	N/A	N/A	Concrete	N/A	6'	
				SB	1	12'	Concrete	6'	Good	N/A	N/A	Concrete	N/A	6'	
Boston Avenue (Route 1)	150 ft W/O Mill Hill Avenue	Ridgefield Avenue	550'	NB	1	12'	Concrete	8'	Fair	No	No	Concrete	N/A	4'	Curb ramp missing at Ridgefield Avenue
				SB	2	11'	Concrete	6'	Good	No	No	Concrete	N/A	3'	
Boston Avenue (Route 1)	Ridgefield Avenue	Bruce Avenue	3,000'	NB	1	15'	Concrete	6'	Poor	No	No	Concrete	N/A	5'	Sidewalk setback approx. 24'
				SB	1	15'	Concrete	4' min	Poor	No	No	Concrete	N/A	5'	Sidewalk in some properties absorbed into parking lots. Parking in ROW. Curb ramp missing at Willow St, Weber St.

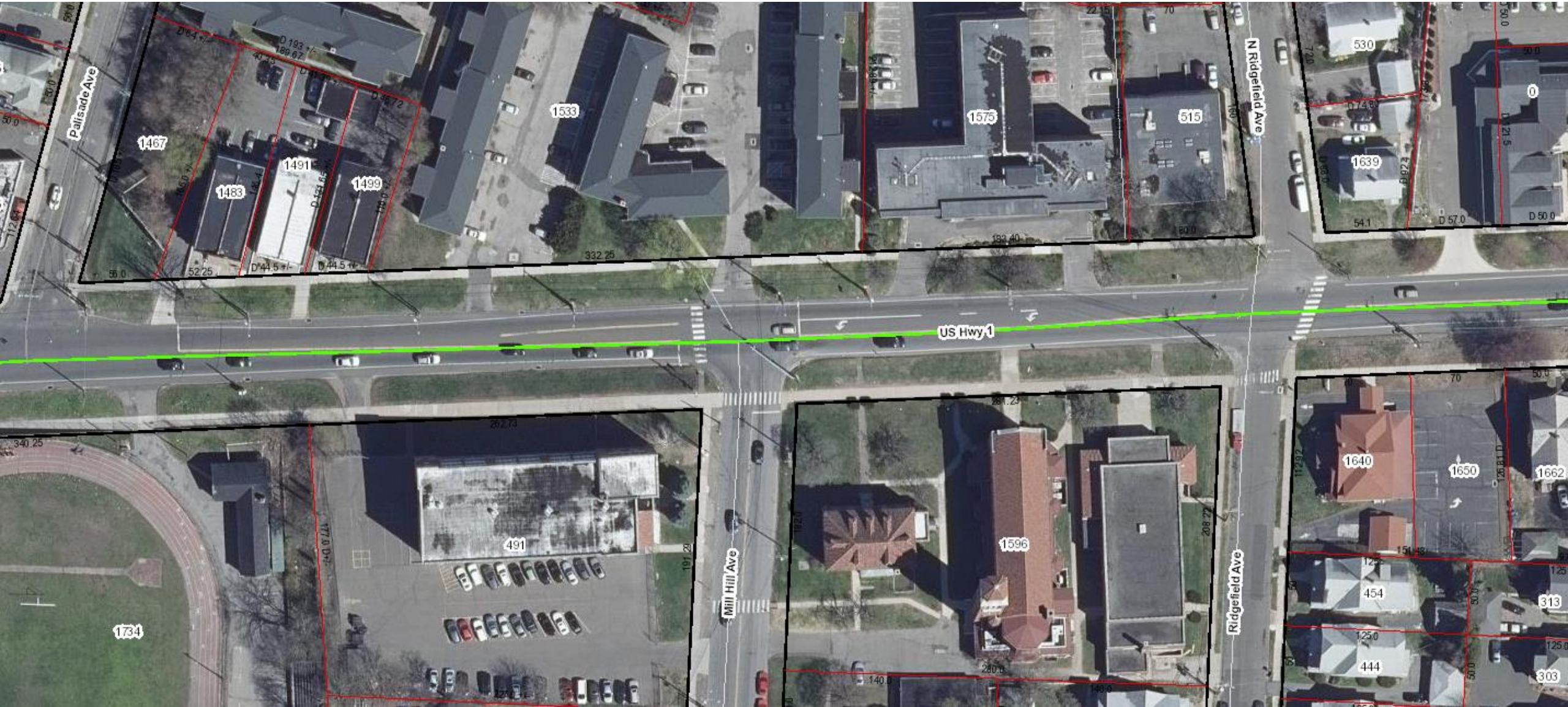
*CONDITION - "Good" is Serviceable Condition that meets current design standards. "Fair" is generally serviceable, but may need minor repairs, or may not completely align with current design standards. "Poor" is not serviceable, and generally inadequate for continued long-term use.

Highlighted cells indicate values which may warrant further investigation

RIGHT-OF-WAY


US Hwy 1
US Hwy 1
Bond St
Dover St
Remington St
Palisade Ave
Sheridan St
Bell St
Central Ave
1313
1347
1367
1379
1395
1403
1415
1425
1455
1467
1483
1491
1292
1356
1360
1368
1384
1392
1402
1905
1897
1891
1887
1875
1734
283
274
266
123
124
118

RIGHT-OF-WAY


Palisade Ave
1467
1491
1483
1499
1533
1575
515
N Ridgefield Ave
530
1639
0
US Hwy 1
340.25
1734
491
Mill Hill Ave
1596
Ridgefield Ave
1640
1650
1662
454
444
313
303

RIGHT-OF-WAY

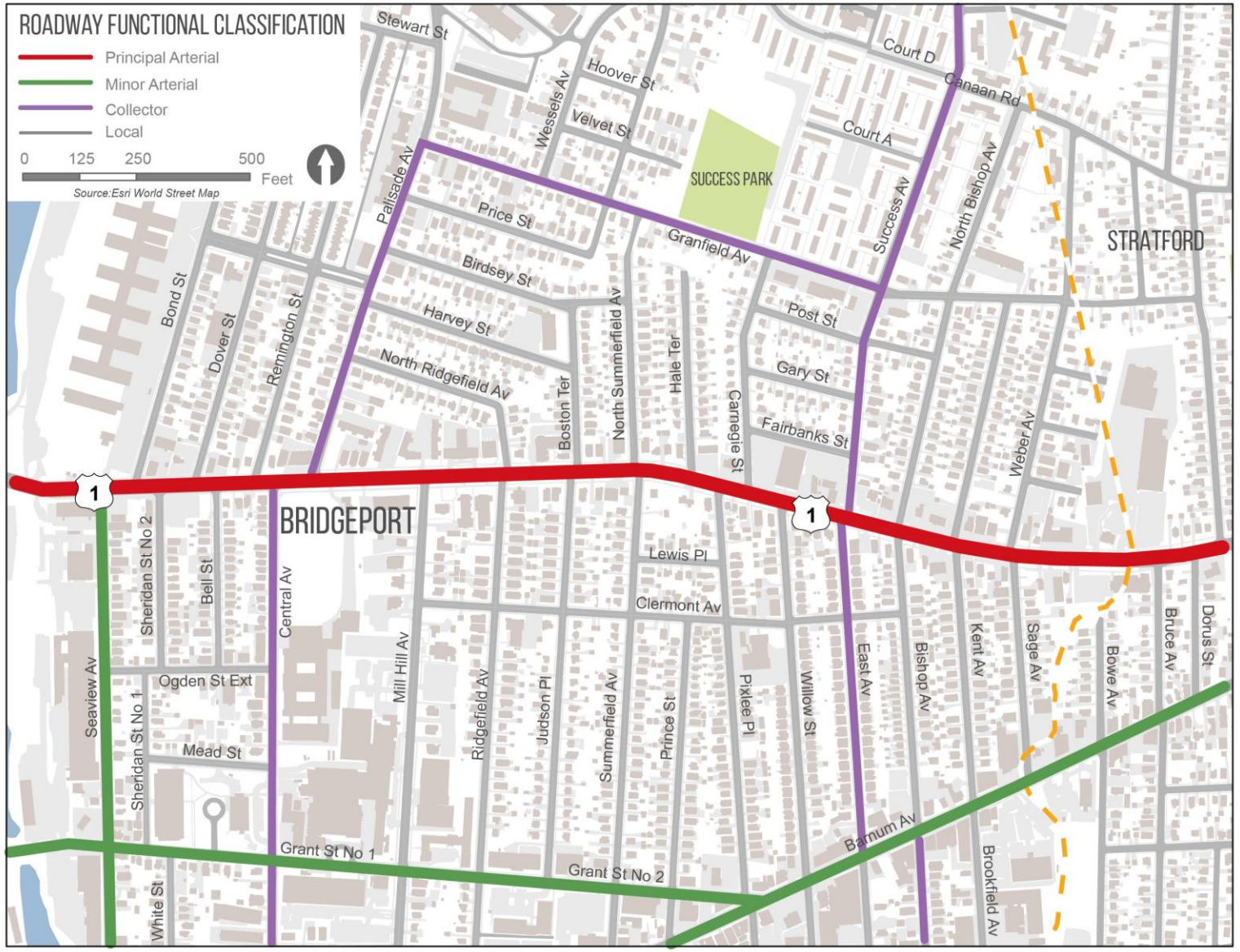

N Bishop Ave
US Hwy 1
Weber Ave
Bishop Ave
Kent Ave
Sage Ave
1955
1965
261
18
1975
1977
2009
2025
258
37
29
2045
2055
2061
2077
38
28
2091
2101
1954
1964
1974
480
478
470
468
460
458
450
448
745
739
733
723
2000
2010
2012
732
722
712
189
179
2044
2060
2068
2076
180
157
162
2126
150

FUNCTIONAL CLASSIFICATION

- Route 1
  (Boston Avenue)
  - Principal Arterial

- Seaview Avenue, Grant Street, Barnum Avenue - Minor Arterials

- Palisade Avenue, Granfield Avenue, Success Avenue, Central Avenue, East Avenue
  - Collectors

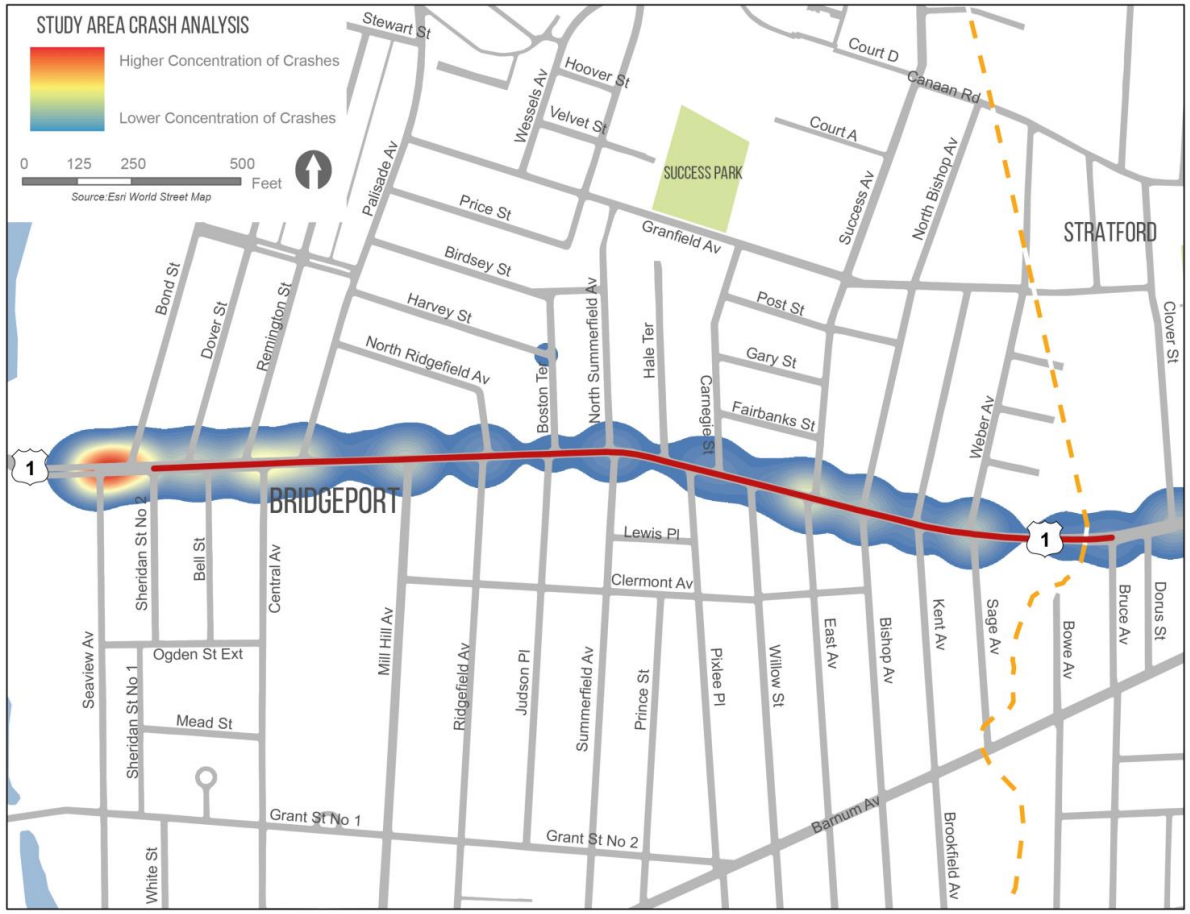


CRASH ANALYSIS

2016 - 2020

Crash Severity

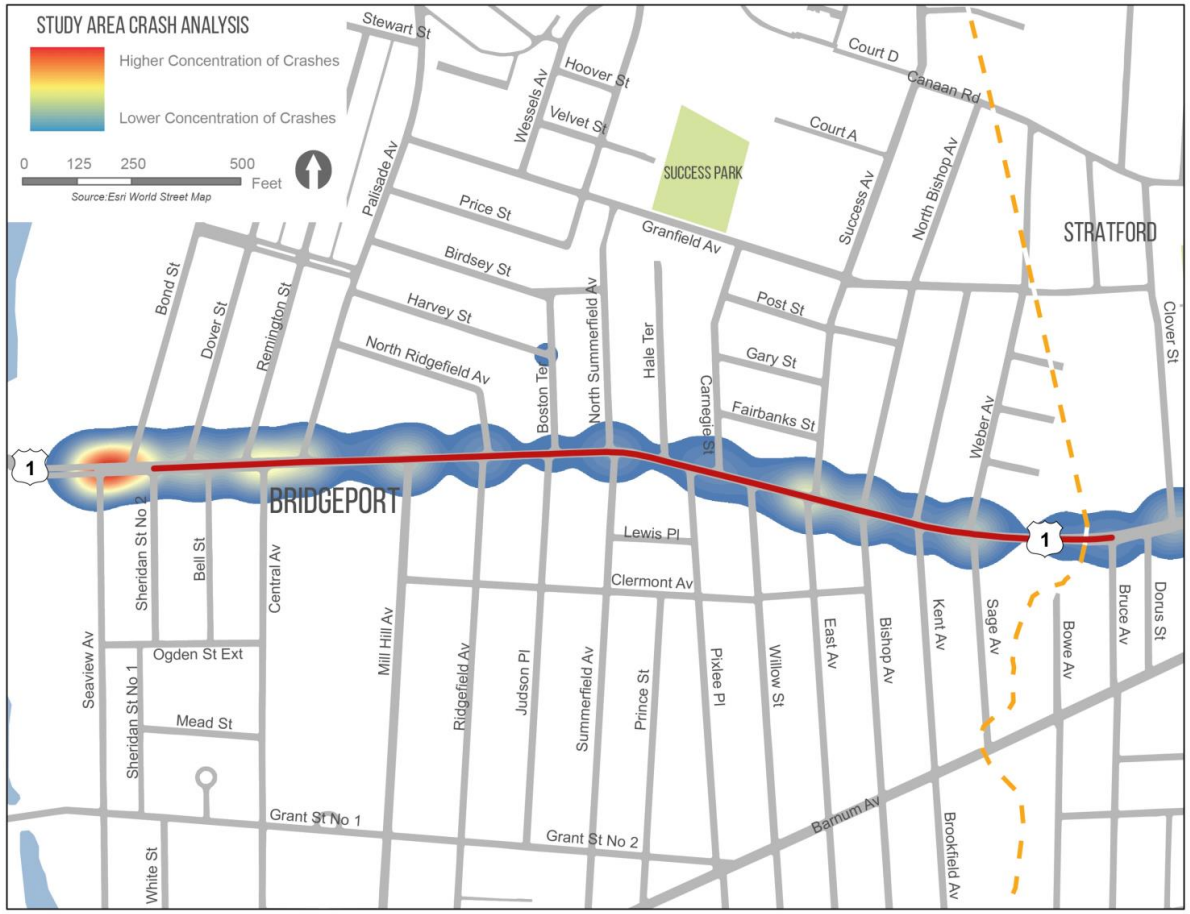
Year	Fatal Injury	Serious Injury	Minor Injury	Possible Injury	No Apparent Injury, Property Damage Only	TOTAL
2016		6	22	22	85	135
2017	1		18	21	86	126
2018			17	32	86	135
2019	1	5	33	25	99	163
2020		1	28	18	66	113
TOTAL	2	12	118	118	422	672



CRASH ANALYSIS

2016 - 2020

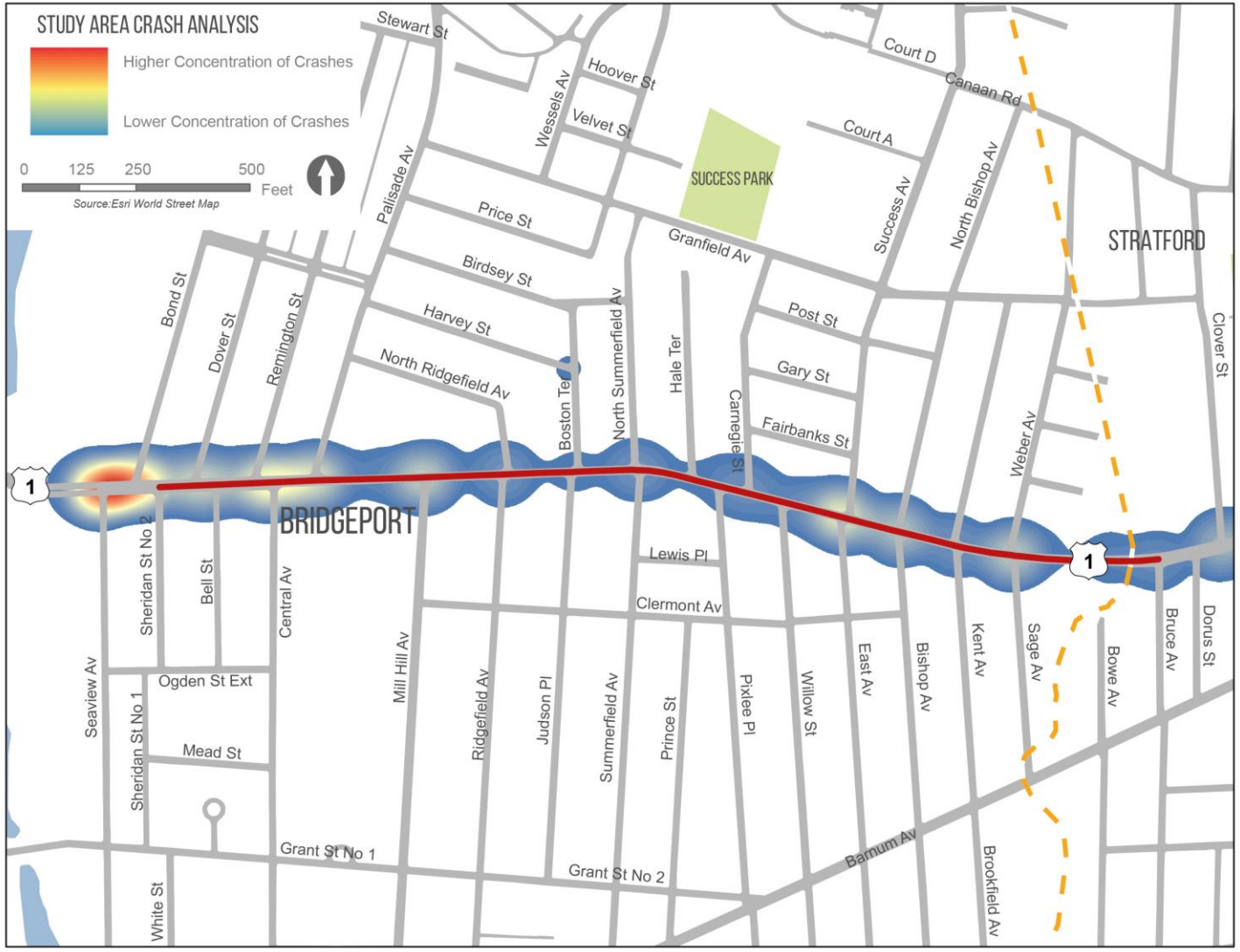
Manner of Impact	Crash Severity: Fatal Injury	Serious Injury	Minor Injury	Possible Injury	No Apparent Injury, Property Damage Only	TOTAL
Front to Rear		5	43	55	182	285
Front to Front			6	4	5	15
Angle		3	38	28	121	190
Sideswipe, Same Direction		1	5	9	61	76
Sideswipe, Opposite Direction		1	5	5	14	25
Rear to Side					10	10
Rear to Rear				2	3	5
Not Applicable / Single Vehicle	2	2	18	7	15	44
Other			3	8	11	22
TOTAL	2	12	118	118	422	672
Crashes Involving Pedestrians	2	0	11	3	0	16
Crashes Involving Bicyclists	0	1	2	0	0	3



CRASH ANALYSIS

Crash Hotspots (5 Yr Crash Total approx.)
672 Crashes Total

- Rte 1 & Seaview / Bond / Sheridan – 181
- Rte 1 & Remington / Central / Palisade – 115
- Rte 1 & East / Success – 59
- Rte 1 & Mill Hill – 48
- Rte 1 & Sage / Weber - 39

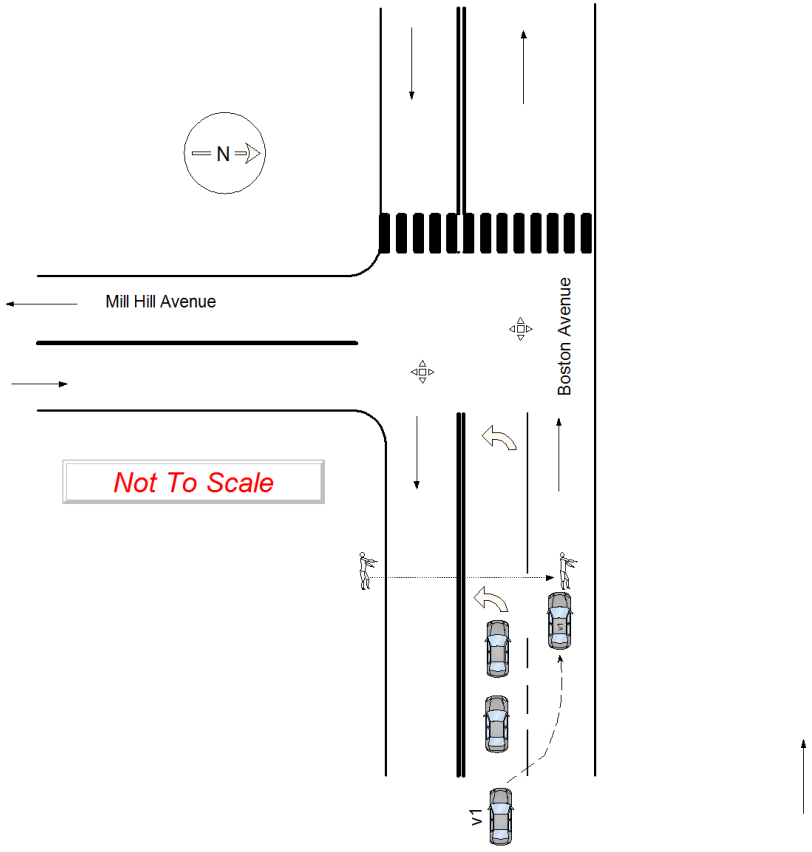


CRASH ANALYSIS – INVOLVED PERSON

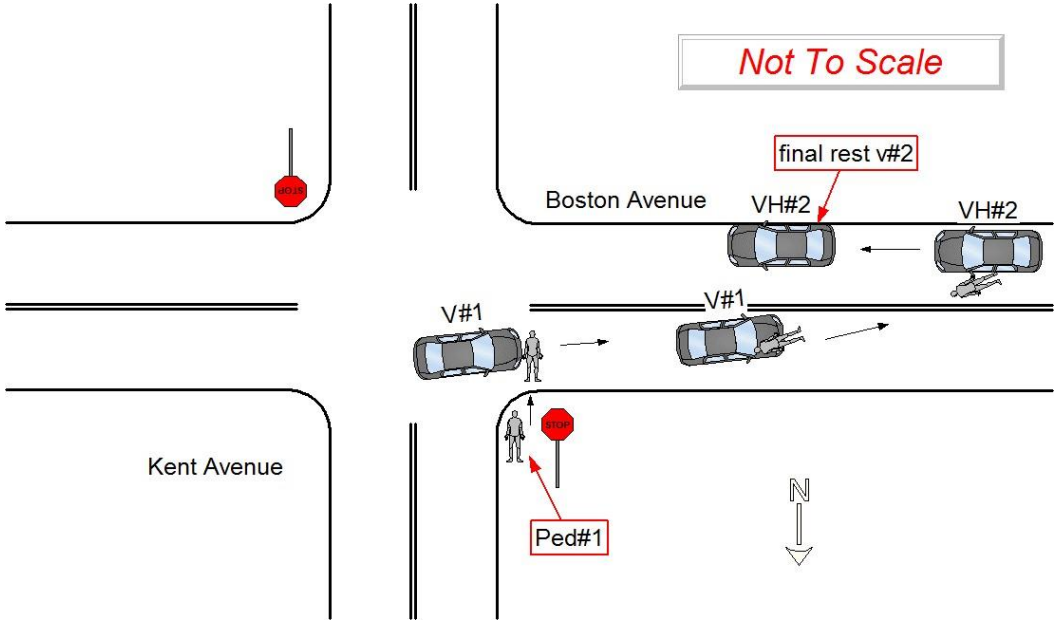
- There were 3 crashes involving bicyclists in the Study Area
- There were 16 crashes involving pedestrians in the Study Area
  - 2 crashes resulted in fatality

May 12, 2017 – Rte 1 east of Mill Hill Ave

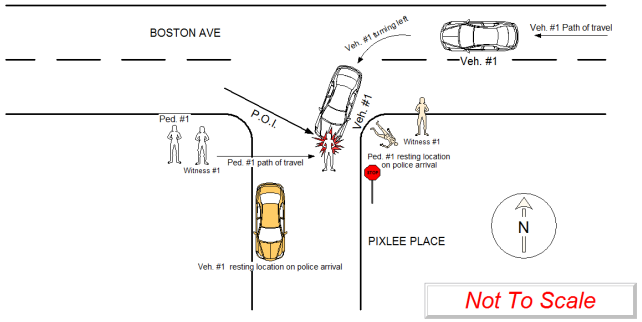
- 80 y/o ped hit due by driver driving under influence DUI

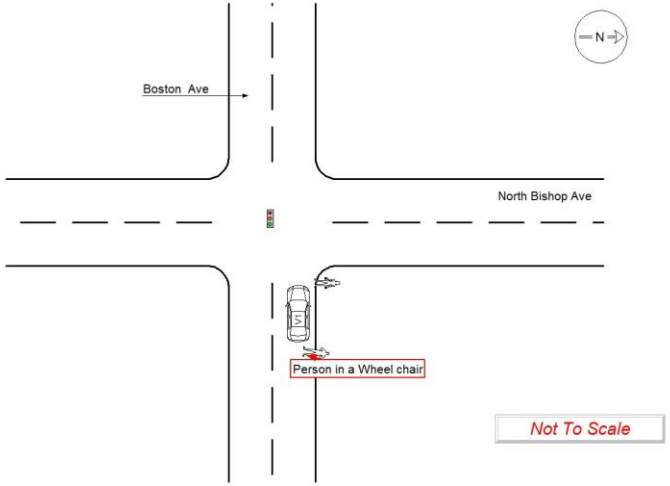


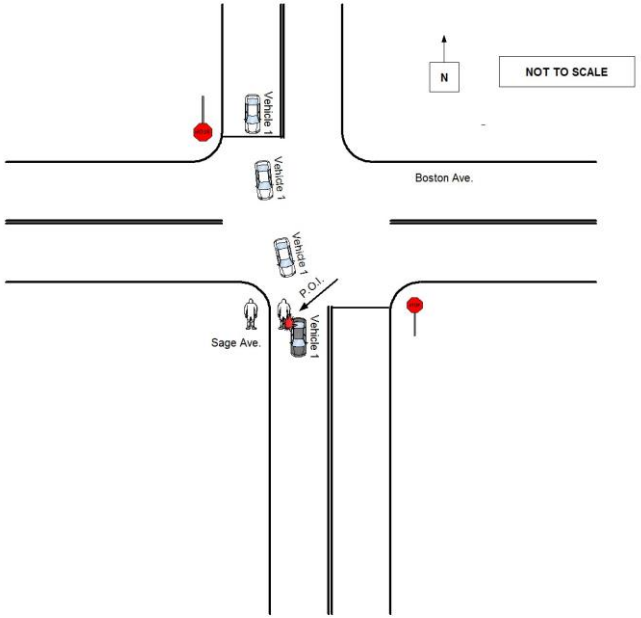
- Jan. 4, 2019 – Rte 1 & Kent – Hit and Run
  - 67 y/o ped hit



Other Ped Crashes

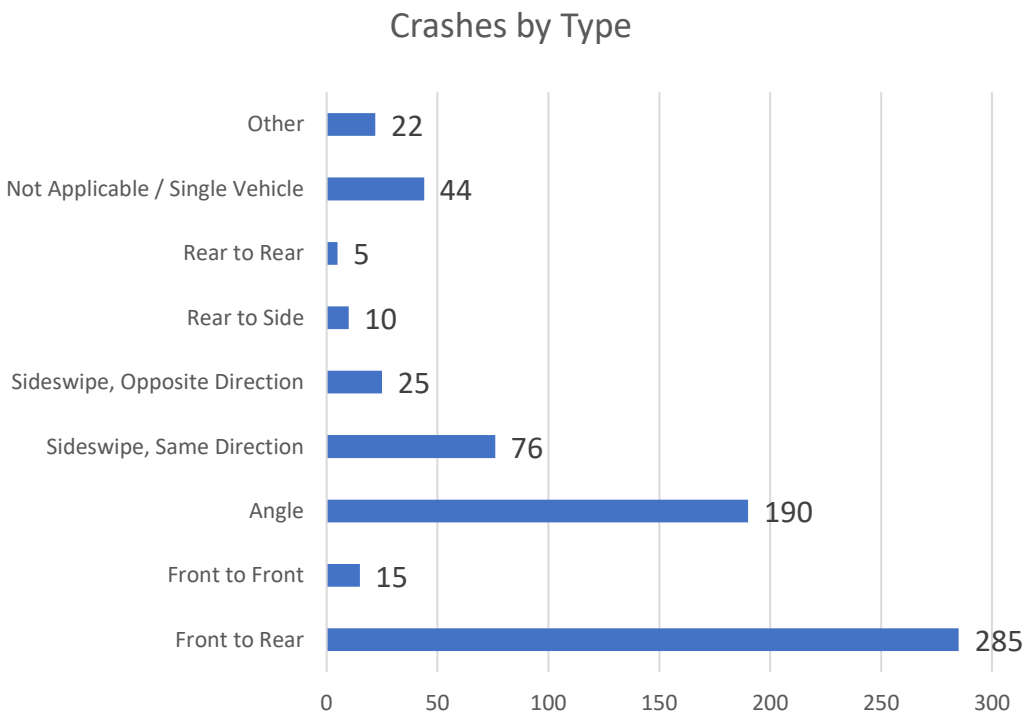


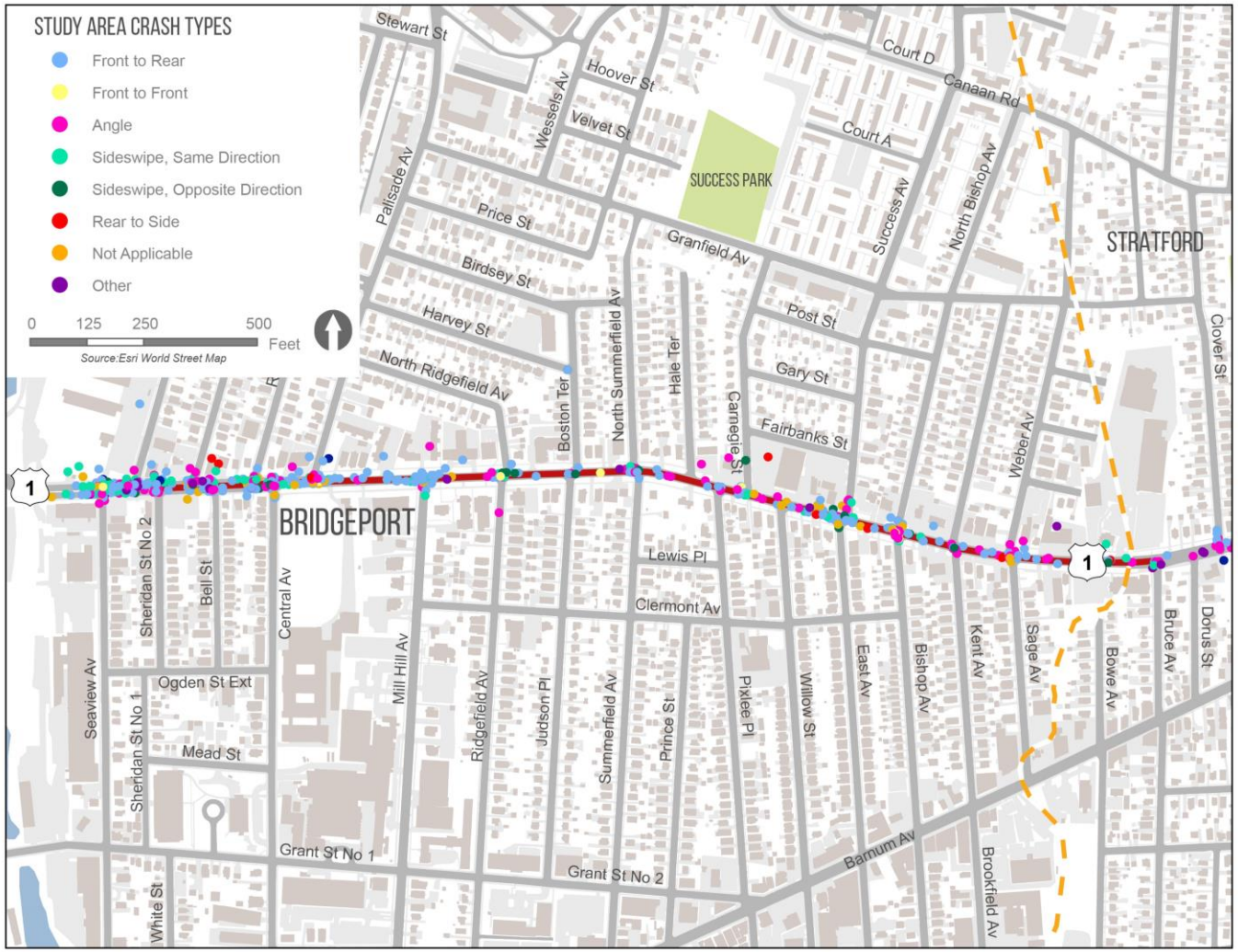




CRASH TYPE

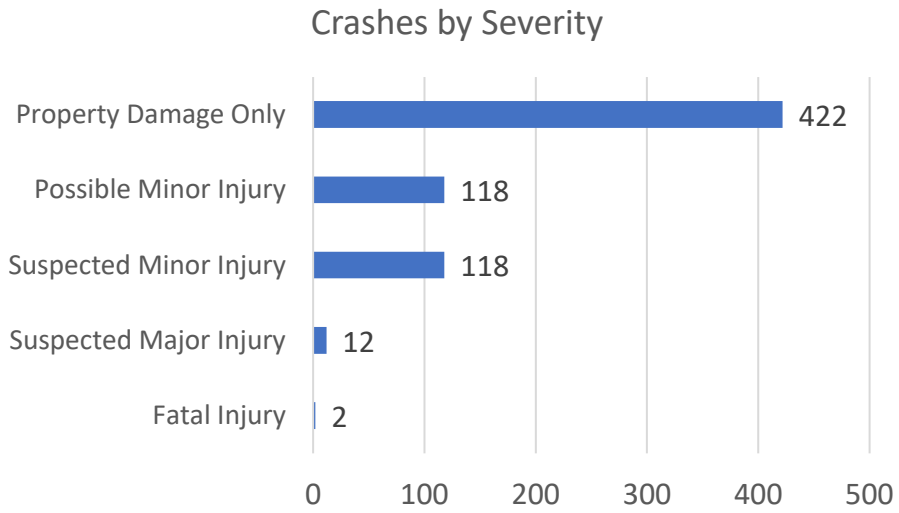
- Majority of Crashes are Front to Rear (Rear End) Crashes that are typical of an area with many intersections and curb cuts, driveways, etc.

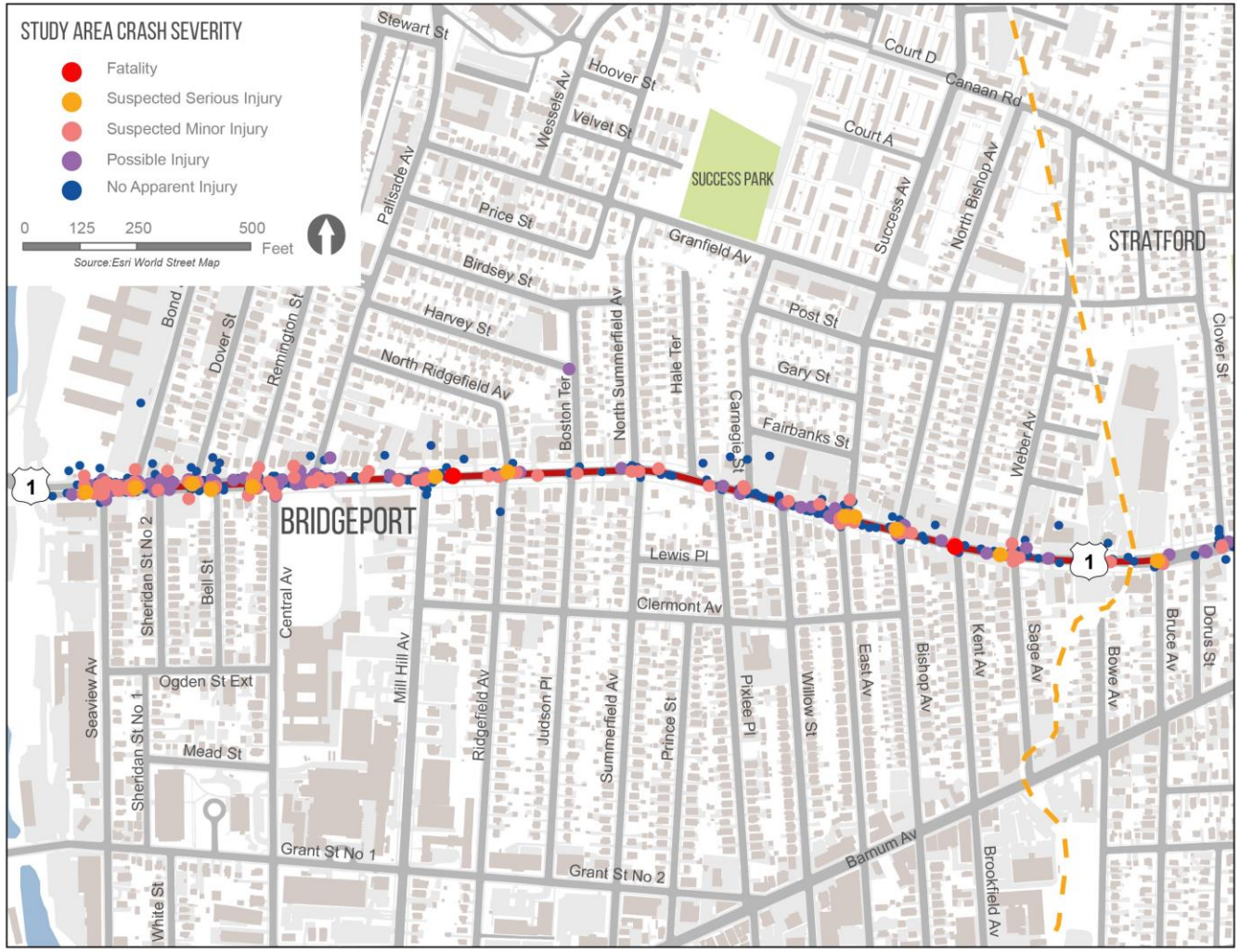




CRASH SEVERITY

- Majority of crashes are classified as No Apparent Injury- Property Damage Only
- There was 250 crashes resulting in at least one injury with 14 crash resulting in a major injury or fatality





REVIEW OF PAST/CURRENT WORK

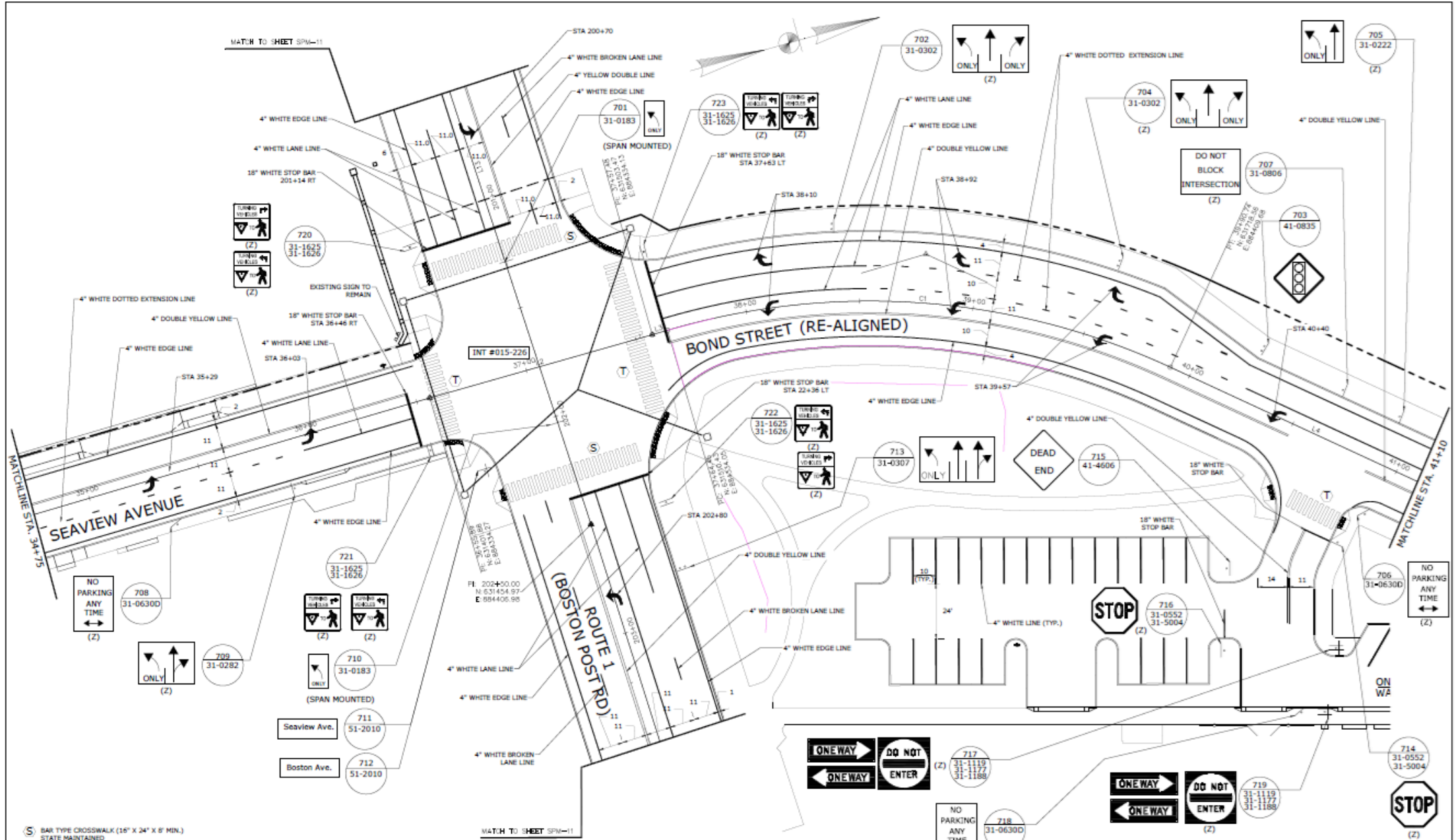
- Active CT Project
- Rte 1 / Seaview intersection redesign

CONNECTICUT ACTIVE TRANSPORTATION PLAN

Table 5: Top 10 Pedestrian and Bicycle Safety Corridors (continued)

Rank	Municipality	Route	Segment Begin	Segment End	Length (Feet)	Proposed Improvements	Engineering Cost	Pedestrian / Bicycle Facilities Cost*	Resurfacing & ADA Ramp Cost	Total Construction Cost	Engineering + Pedestrian / Bicycle Facilities Cost	Total Cost
7	Bridgeport	1	Bruce Av.	Seaview Av.	4,790	• Sidewalk and ADA ramp upgrades • Roadway resurfacing • Traffic and pedestrian signal upgrades • Selective full depth reconstruction • Concrete curbing	$1,100,000	$9,300,000	$2,600,000	$11,900,000	$10,400,000	$13,000,000
8	Norwalk	1	Richards Av.	I-95 SB Ramps	6,020	• Sidewalk and ADA ramp upgrades • Roadway resurfacing • Traffic and pedestrian signal upgrades • Selective full depth reconstruction • Curbing	$1,000,000	$2,500,000	$2,500,000	$5,000,000	$3,500,000	$6,000,000
9	Stonington	1	May Flower Av.	CT/RI State Line	3,840	• Sidewalk and ADA ramp upgrades • Roadway resurfacing • Road diet for bicycle lane • Roundabout • Selective full depth reconstruction	$800,000	$3,500,000	$1,200,000	$4,700,000	$4,300,000	$5,500,000
10A	Manchester	6	Goodwin St.	Vernon Rd.	21,860	• Sidewalk and ADA ramps upgrades • Road diet for two bicycle lanes, two travel lanes, and parking on alternating sides of roadway • Bump-outs • Minor intersection improvement at Porter St • Major intersection improvement at Pine St / West Center St	$1,100,000	$8,600,000	$4,300,000	$12,900,000	$9,700,000	$14,000,000
10B	East Hartford	5	Burnside Av.	Pitkin St.	4,140	• Sidewalk and ADA ramps upgrades • Roadway resurfacing • Road diet for bicycle lane • Pedestrian signal upgrade • Selective full depth reconstruction • Curbing	$700,000	$1,000,000	$2,200,000	$3,200,000	$1,700,000	$3,900,000
										Total	$74,000,000	$105,200,000

** Includes all "proposed improvements" listed in table other than "resurfacing and ADA ramp costs"*



(S) BAR TYPE CROSSWALK (16" X 24" X 8' MIN.) STATE MAINTAINED

(T) BAR TYPE CROSSWALK (16" X 24" X 8' MIN.) TOWN MAINTAINED

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OR ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted:
Stantec Project No.: 192310456

DESIGNER/DRAFTER: CG/ALR
CHECKED BY: CV2
SCALE IN FEET 0 20 40
SCALE 1"=20'

Filename:

CITY OF BRIDGEPORT CONNECTICUT

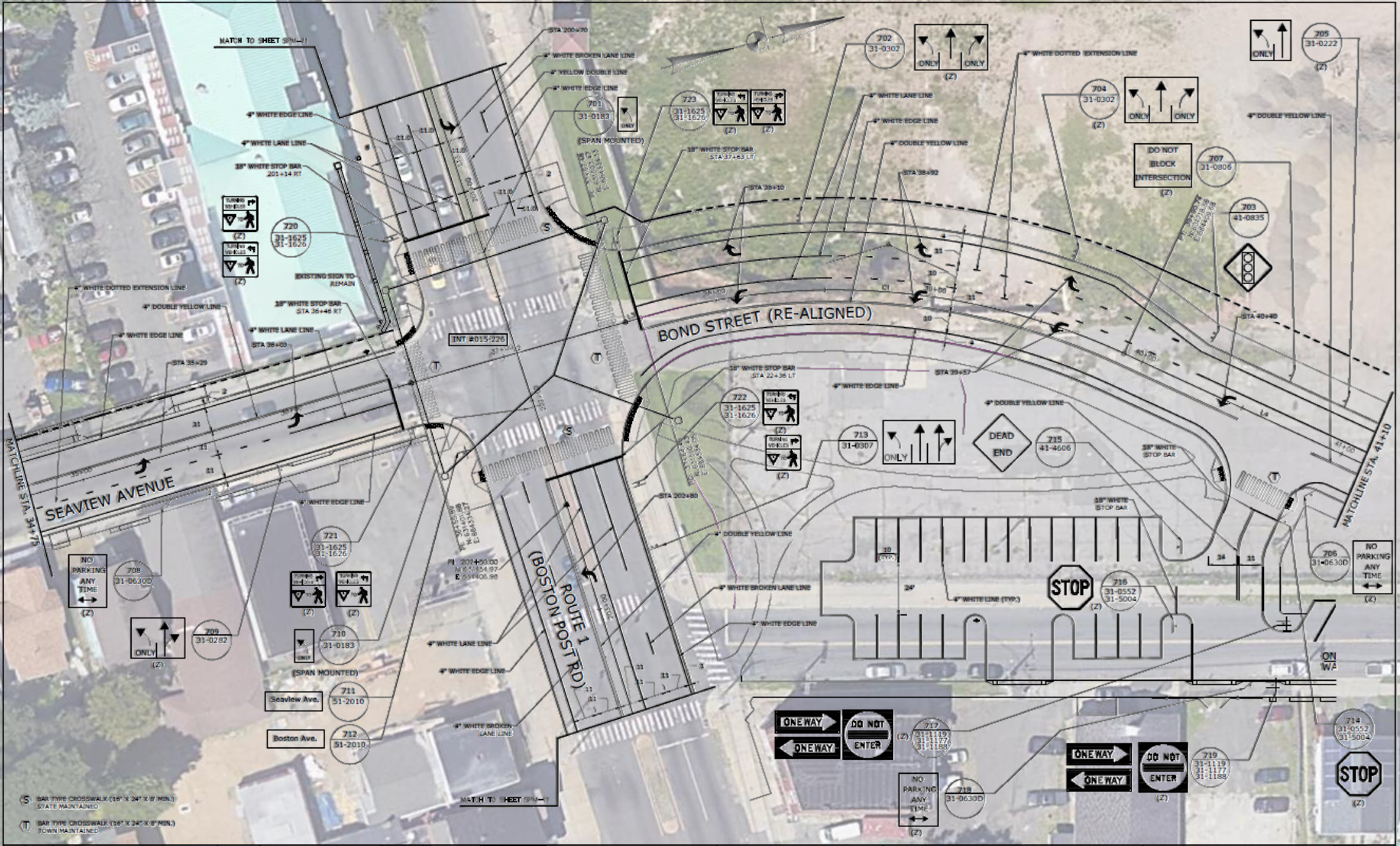
Stantec Consulting Services Inc.
55 Church Street, Suite 601
New Haven, CT
06510-3014
TEL 203.498-1645
FAX 203.498-1602
www.stantec.com

PROJECT TITLE: SEAVIEW AVENUE CORRIDOR IMPROVEMENTS

TOWN: BRIDGEPORT

DRAWING TITLE: SIGNING & PAVEMENT MARKINGS PLAN

PROJECT NO. 15-371
DRAWING NO. SPM-07
SHEET NO. 04.11



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Plotted:
Stantec Project No.: 192310456

DESIGNER/DRAFTER: CJA/ALR
CHECKED BY: CVZ

SCALE IN FEET
0 20 40
SCALE 1"=20'

CITY OF BRIDGEPORT CONNECTICUT

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TOWN:
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DRAWING TITLE:
SIGNING & PAVEMENT MARKINGS PLAN

PROJECT NO. 15-371
DRAWING NO. SPM-07
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SAMPLE IMPROVEMENTS TO IMPROVE SAFETY IN THE STUDY AREA

SPEED HUMPS

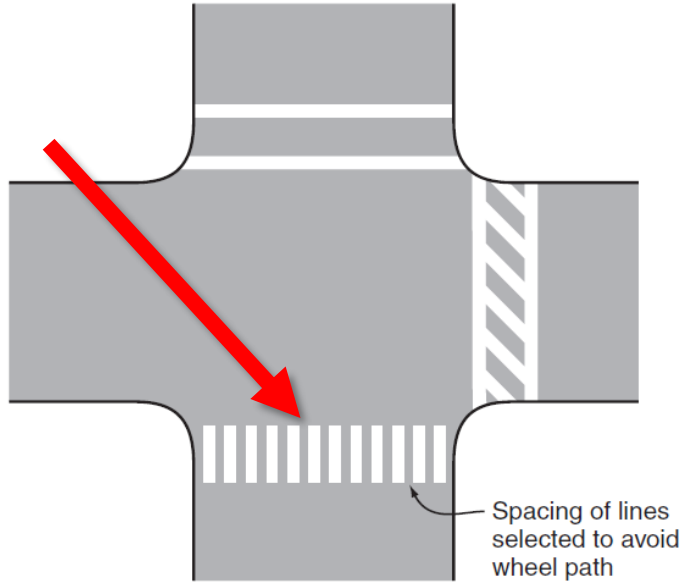
- Typically 3 inches in height and 12 feet in length along the vehicle travel path axis.

- Encourages the motorist to travel at a slow speed.

CROSSWALKS

- Continental crosswalks provide the most visibility for crosswalks
- Continental crosswalks are already standard at many crossings, but some crossings do not have any markings

Figure 3B-19. Examples of Crosswalk Markings



MUTCD Graphic

RRFB & HAWK

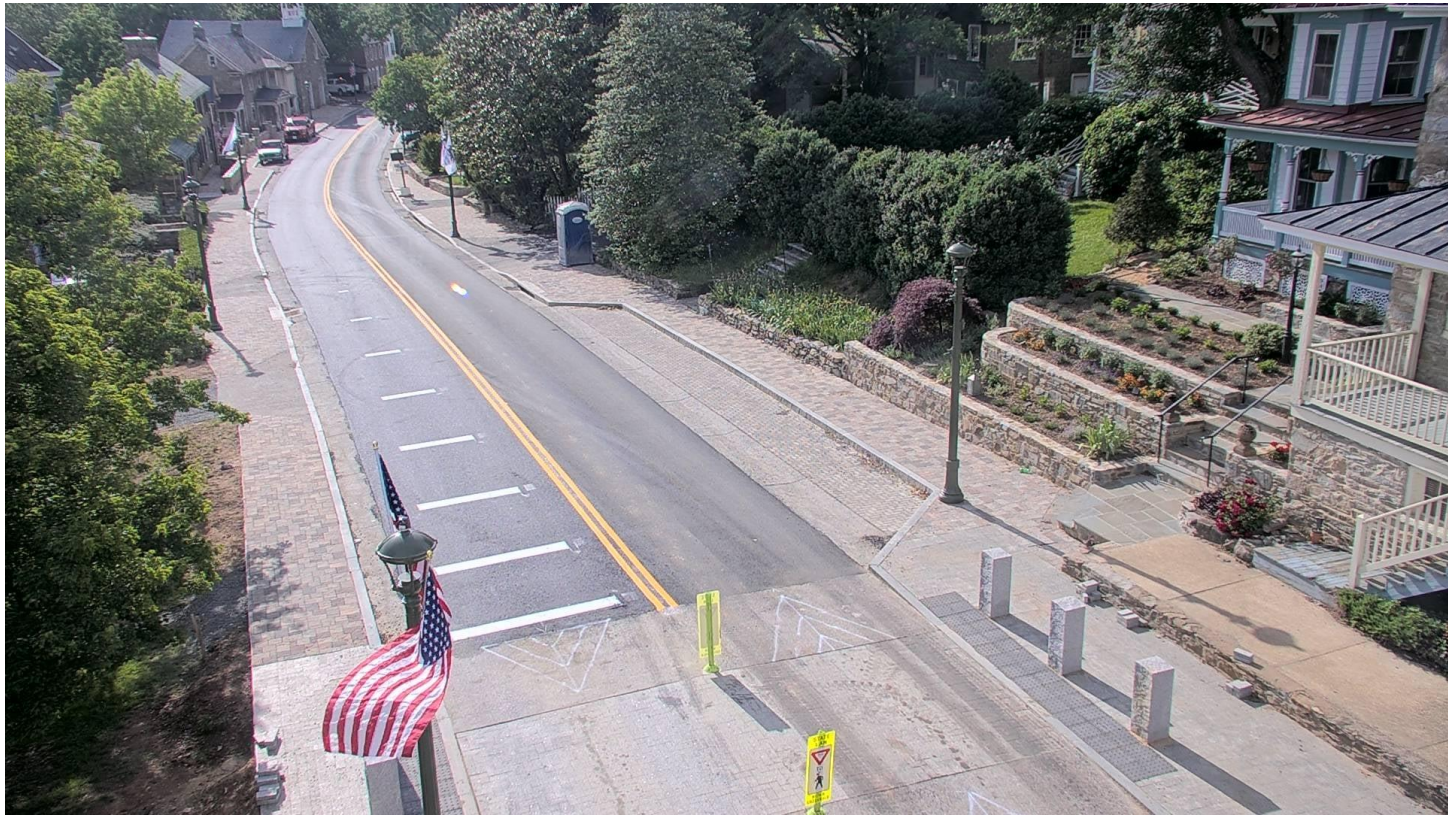
- RRFB
  - Rectangular Rapid Flashing Beacon
  - Provides enhanced visibility of crosswalks, but is **not** a regulatory signal
- HAWK = **H**igh Intensity **A**ctivated Cross**W**al**K**
  - Provides a red signal for on-coming motorists

Top – RRFB in Bronxville, NY; Bottom – HAWK in Stamford, CT

RAISED CROSSWALKS

- Improves pedestrian safety by causing motorist speeds to decrease at the crossing.

- Typically between 3 and 6 inches above street level. It is common for a raised crosswalk to be level with the street curb.
  - Height increases the visibility of a pedestrian in a crosswalk to a motorist.



Route 9, Hillsboro, Virginia – Rethink9.com

CORNER EXTENSION/BULBOUT

- A curb extension is a horizontal extension of the sidewalk into the street resulting in a narrower roadway and a shorter crosswalks.

- Slows automobile turning speeds, shortens pedestrian crossing distance, and increases pedestrian visibility

Concord, NH – Main Street

MEDIAN ISLAND

- Raised island located along a street centerline.

- Narrows the travel lanes at that location
  - Visual appearance of narrowed lanes encourages a motorist to slow.

MEDIAN ISLAND WITH PROTECTED CROSSING

- Raise island wide enough to allow pedestrian to cross in two-stages

Route 9, Hillsboro, Virginia – Rethink9.com

ROAD DIET - TWO WAY LEFT TURN LANE

- A road diet reduces the number of lanes on a roadway
- Commonly, a road diet provides dedicated space for left turns where only shared left/through lanes previously existed
- A road diet can be implemented using a two-way left-turn lane or alternating left-turn lanes
- Increases a road's efficiency by channeling turning vehicles out of the through lanes.
- A road diet can *improve* traffic flow and reduce conflicts with turning vehicles

PEDESTRIAN SIGNAL HEADS AND PHASING

- Exclusive Pedestrian Phase
  - All traffic stops during entire pedestrian phase
  - Requires that pedestrians wait until traffic phases end

- Concurrent Pedestrian Phase
  - Pedestrian phase gets WALK during parallel street movement
  - Allows for pedestrians to move with traffic

- LPI = Leading Pedestrian Interval
  - Provided during *concurrent* pedestrian phase – LPI provides a 3-7 WALK interval prior to start of green

An LPI allows a pedestrian to establish presence in the crosswalk before vehicles are given a green indication.

FHWA Photo

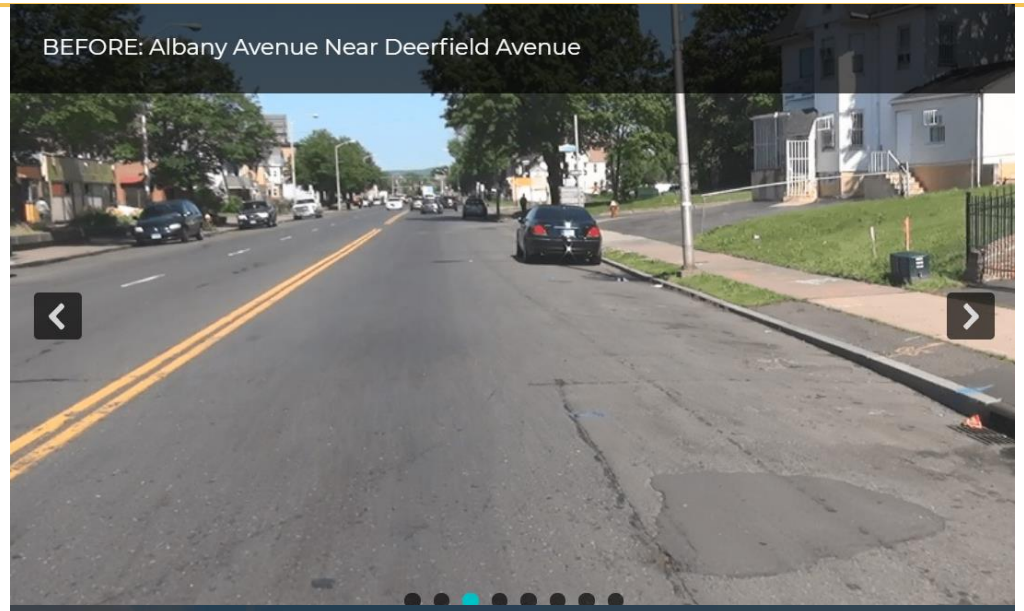
BIKE LANES & OTHER BIKE FACILITIES

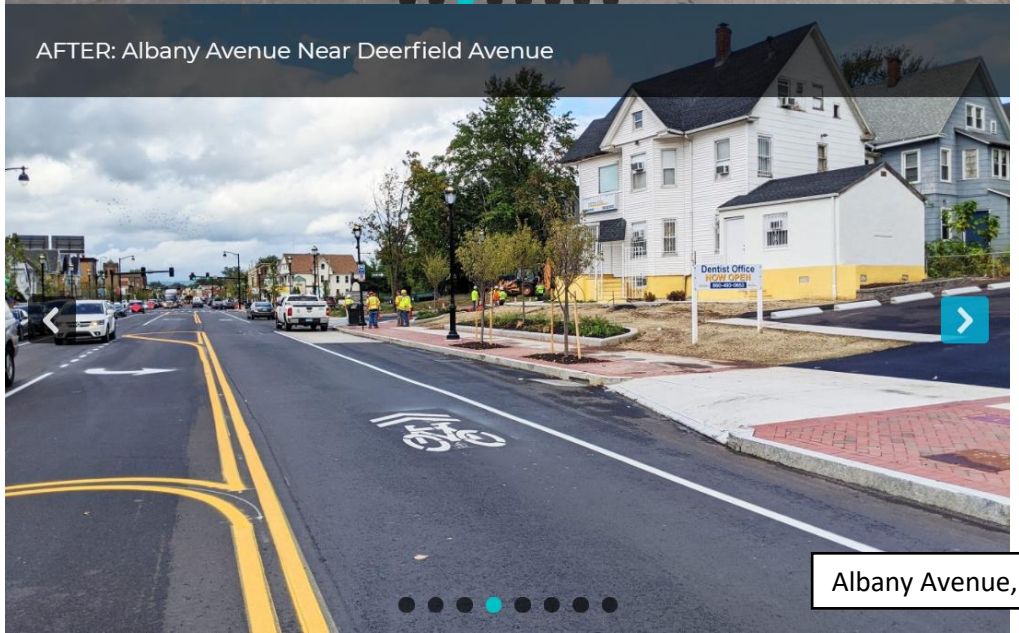
- Bike lanes and other bike facilities can provide comfortable bike travel in ROW
- For study area traffic and speeds, buffered bike lane or a separated facility most appropriate

Buffered Bike Lane in West Hartford, CT
Separated Bike Lane, New Haven, CT

STREETSCAPE DESIGN

- Streetscape elements can communicate different priorities based on design with use of:
  - Curbing materials
  - Landscaping
  - Lighting
  - Sidewalk / Buffer Materials
  - Other amenities





Albany Avenue, Hartford, CT

ON-STREET PARKING

- On-street parking can narrow roadway travel lanes by adding friction to traffic flow
- Parking can provide buffer for pedestrian zones

DISCUSSION ON ISSUES IN THE STUDY AREA AND OPPORTUNITIES

TODAY'S WALK AUDIT

- Review safety protocols, reflective vests, etc.
- Meet at Aaron's Plaza at 11 AM. Shopping Center parking lot, closest spaces to Route 1
- Walk the Study Area corridor and assess existing conditions and identify areas for improvement
- Post Audit discussion immediately following

THANK YOU!

Bridgeport Road Safety Audit

Meeting Location: Virtual Meeting

Date and Time: Tuesday, October 19th at 3:00 – 4:00 PM

Agenda

1. **Welcome and Introductions**
2. **Pre-Audit Presentation and Discussion**
    - Definition of Study Area
    - Review Site Specific Data
        - Average Daily Traffic
        - Crash Data
        - Geometrics
3. **Walk Audit Procedures and Safety**

Notes for Participants

- All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, as stakeholders' 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.

Bridgeport Road Safety Audit

Meeting Location: Bridgeport, Aaron's Plaza, park in area nearest to Route 1

Address: Park at Aaron's Plaza, 2165 Boston Avenue, Bridgeport

Date and Time: Wednesday, October 20th at 11:00 AM

Agenda

4. **Welcome and Introductions**
5. **Review of Road Safety Audit Route**
6. **Audit**
    - Visit Study Area
    - Complete Audit Checklist
    - Identify issues and opportunities for improvements
7. **Post-Audit Discussion**
    - Discussion observations and finalize findings
    - Discuss potential improvements and final recommendations
    - Next Steps

Notes for Participants

- All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, as stakeholders' 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.

Bridgeport Audit Checklist

Pedestrians and Bicycles	Comment

Pedestrian Crossings
• Sufficient time to cross (signal)
• Signage
• Pavement Markings
• Detectable warning devices (signal)
• Adequate sight distance
• Wheelchair accessible ramps
  ○ Grades
  ○ Orientation
  ○ Tactile Warning Strips
• Pedestrian refuge at islands
• Other	

Pedestrian Facilities
• Sidewalk
  ○ Width
  ○ Grade
  ○ Materials/Condition
  ○ Drainage
  ○ Buffer
• Pedestrian lighting
• Pedestrian amenities (benches, trash receptacles)
• Other	

Bicycles • Bicycle facilities/design • Separation from traffic • Conflicts with on-street parking • Pedestrian Conflicts • Bicycle signal detection • Visibility • Roadway speed limit • Bicycle signage/markings • Shared Lane Width • Shoulder condition/width • Traffic volume • Heavy vehicles • Pavement condition • Other	

Roadway & Vehicles	

• Speed-related issues
  ○ Alignment;
  ○ Driver compliance with speed limits
  ○ Sight distance adequacy
  ○ Safe passing opportunities	

• Geometry
  ○ Road width (lanes, shoulders, medians);
  ○ Access points;
  ○ Drainage
  ○ Tapers and lane shifts
  ○ Roadside clear zone /slopes
  ○ Guide rails / protection systems	

• Intersections
  ○ Geometrics
  ○ Sight Distance
  ○ Traffic control devices
  ○ Safe storage for turning vehicles
  ○ Capacity Issues	

• Pavement
  ○ Pavement Condition (excessive roughness or rutting, potholes, loose material)
  ○ Edge drop-offs
  ○ Drainage issues
• Lighting Adequacy	

• Signing
  • Correct use of signing
  • Clear Message
  • Good placement for visibility
  • Adequate retroreflectivity
  • Proper support	

• Signals
  ○ Proper visibility
  ○ Proper operation
  ○ Efficient operation
  ○ Safe placement of equipment
  ○ Proper sight distance
  ○ Adequate capacity	

• Pavement Markings
  ○ Correct and consistent with MUTCD
  ○ Adequate visibility
  ○ Condition
  ○ Edgelines provided	

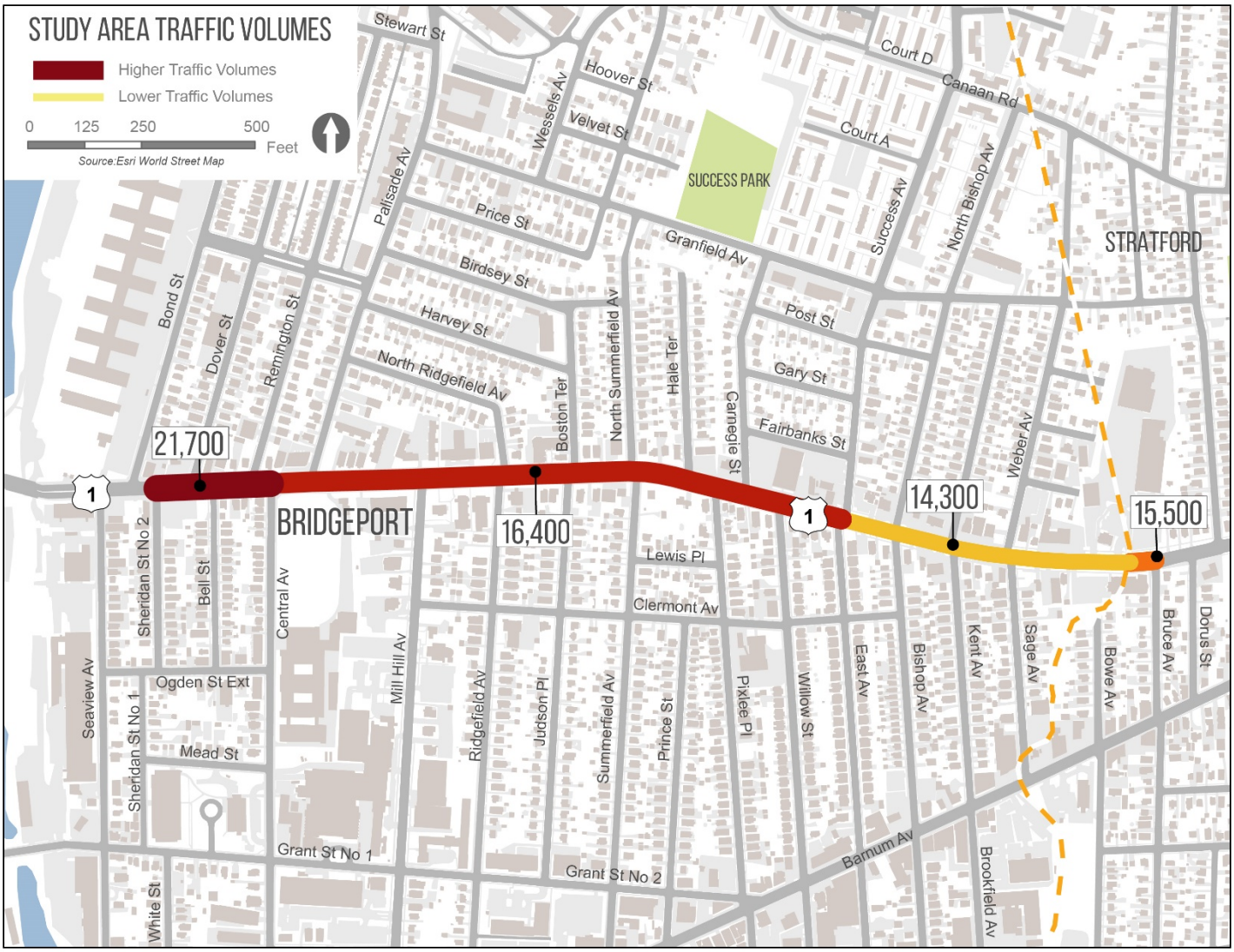
• Miscellaneous
  ○ Weather conditions impact on design features.
  ○ Snow storage	

Bridgeport Road Safety Audit - Study Area

- Route1 between Sheridan Street and Stratford town line (Bruce Avenue)

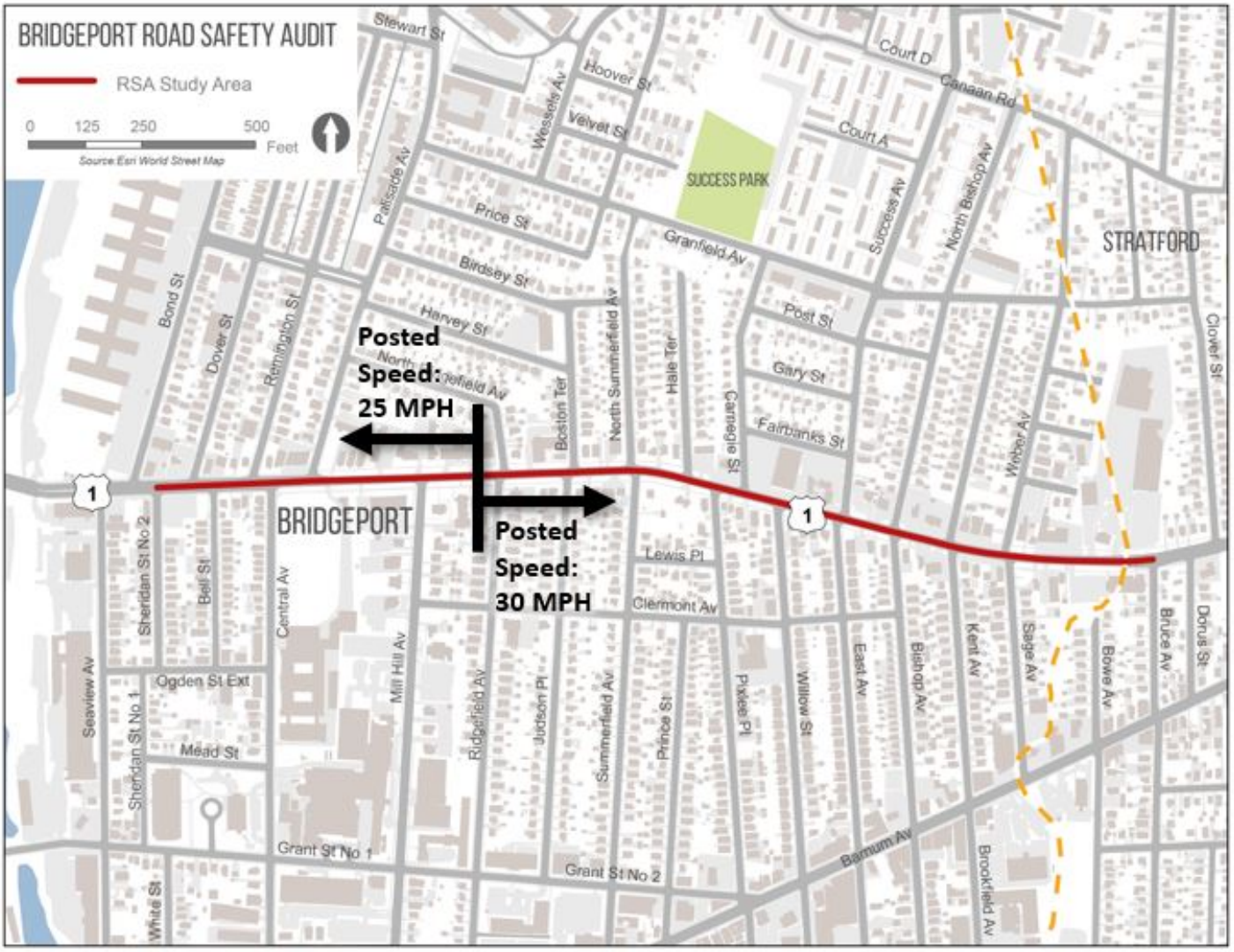
Bridgeport Road Safety Audit - Average Daily Traffic Volumes in 2017

*(Note, during 2020 COVID-19, volumes were reported at less than half of these numbers)

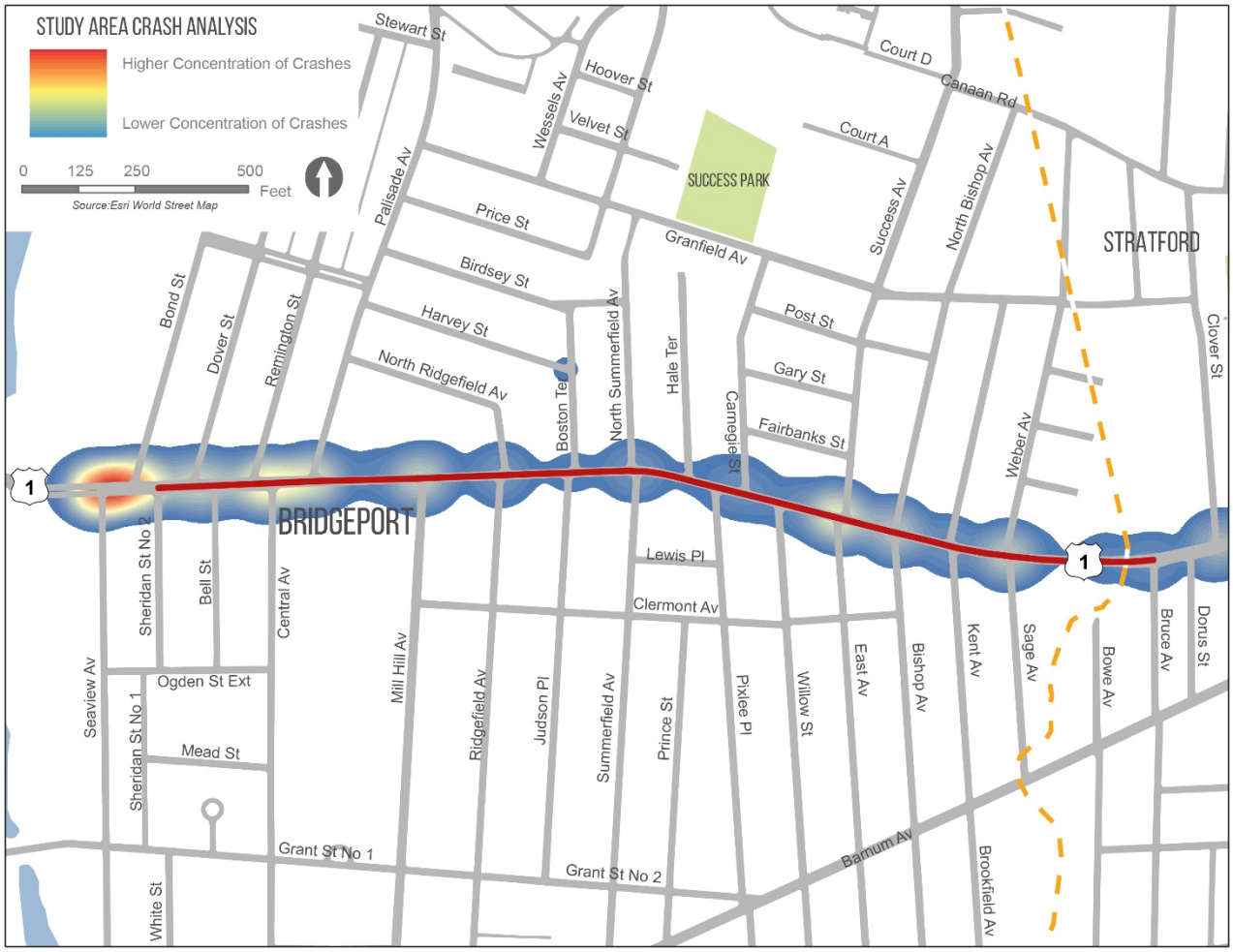


Brideport Road Safety Audit - 85th Percentile Speeds - 2020

- Based on CTDOT data collected December 2020, posted speeds limits vary between 30-40 mph. Speed limit in Study Area is between 25 MPH west of Ridgefield Avenue and 30 MPH east of Ridgefield Avenue



Bridgeport Road Safety Audit - Crash Summary Heat Map



Bridgeport Road Safety Audit - Crash Summary

Years: 2016 – 2020

Manner of Impact	*Crash Severity*					
	Fatal Injury	Serious Injury	Minor Injury	Possible Injury	No Apparent Injury, Property Damage Only	**TOTAL**
Front to Rear		5	43	55	182	285
Front to Front			6	4	5	15
Angle		3	38	28	121	190
Sideswipe, Same Direction		1	5	9	61	76
Sideswipe, Opposite Direction		1	5	5	14	25
Rear to Side					10	10
Rear to Rear				2	3	5
Not Applicable / Single Vehicle	2	2	18	7	15	44
Other			3	8	11	22
TOTAL	2	12	118	118	422	672
Crashes Involving Pedestrians	2	0	11	3	0	16
Crashes Involving Bicyclists	0	1	2	0	0	3

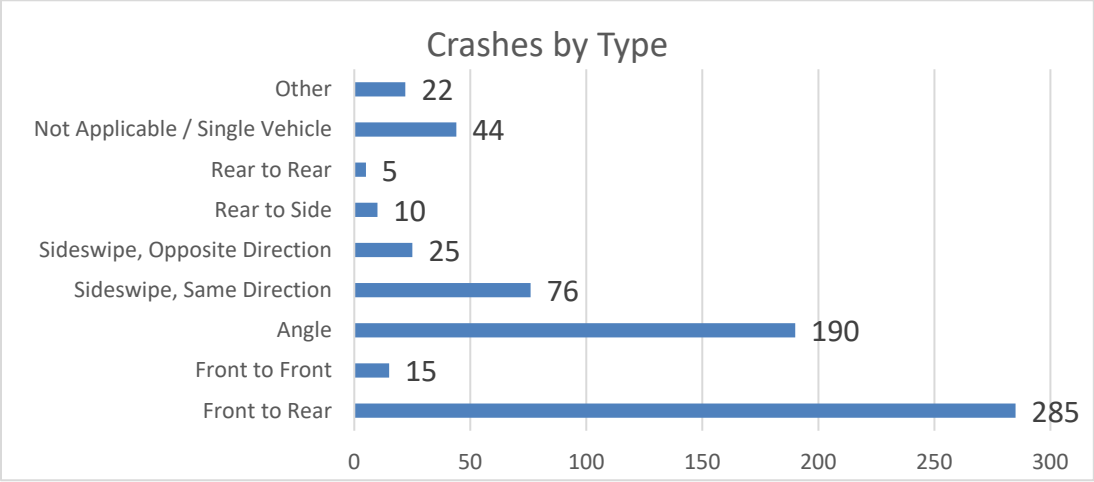
Summary Analysis:

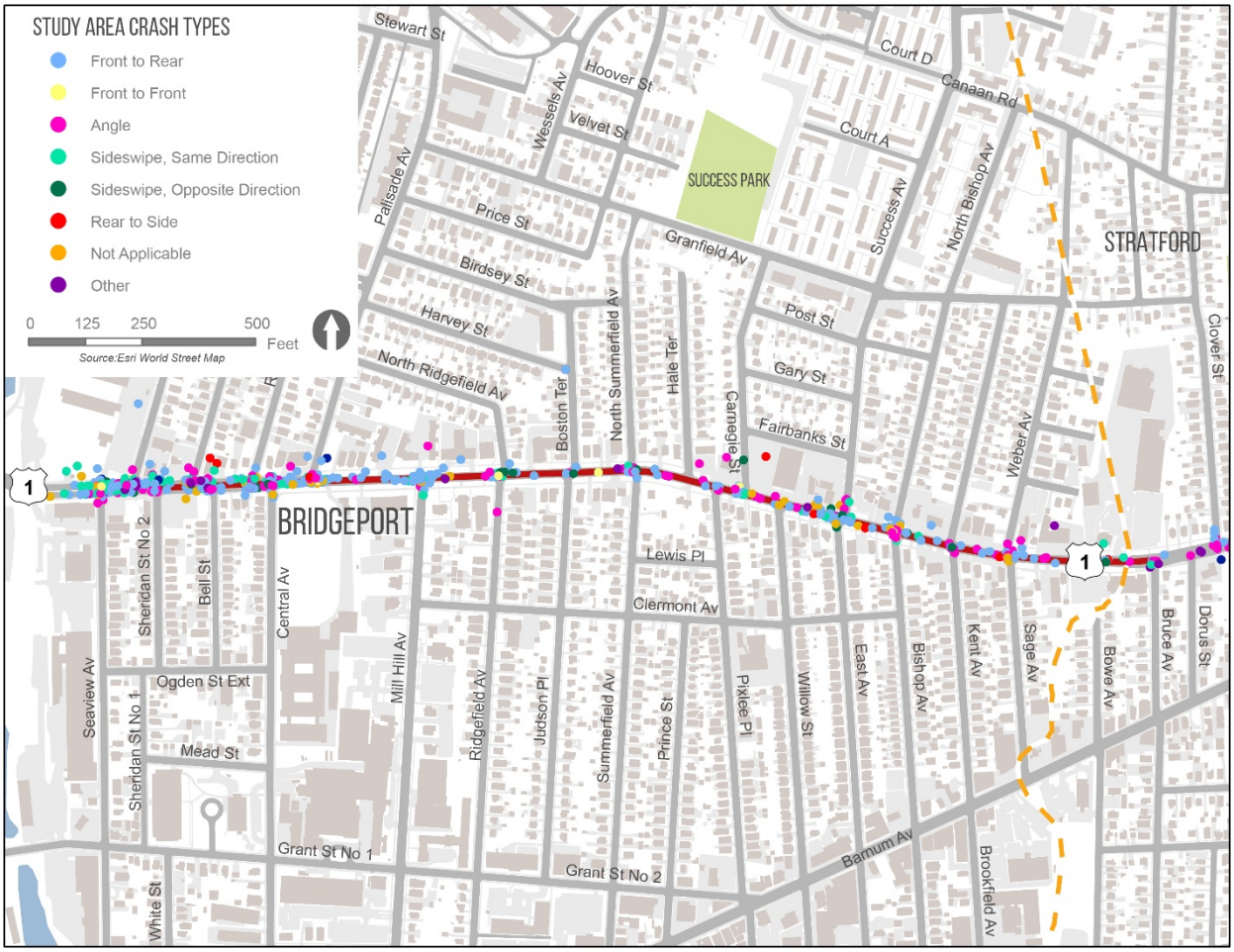
Crash Hotspots (5 Year Crash Total approx.) 672 Crashes Total

- Rte 1 & Seaview / Bond / Sheridan – 181
- Rte 1 & Remington / Central / Palisade – 115
- Rte 1 & East / Success – 59
- Rte 1 & Mill Hill – 48
- Rte 1 & Sage / Weber - 39

Bridgeport Road Safety Audit Crash Summary - Crashes by Type

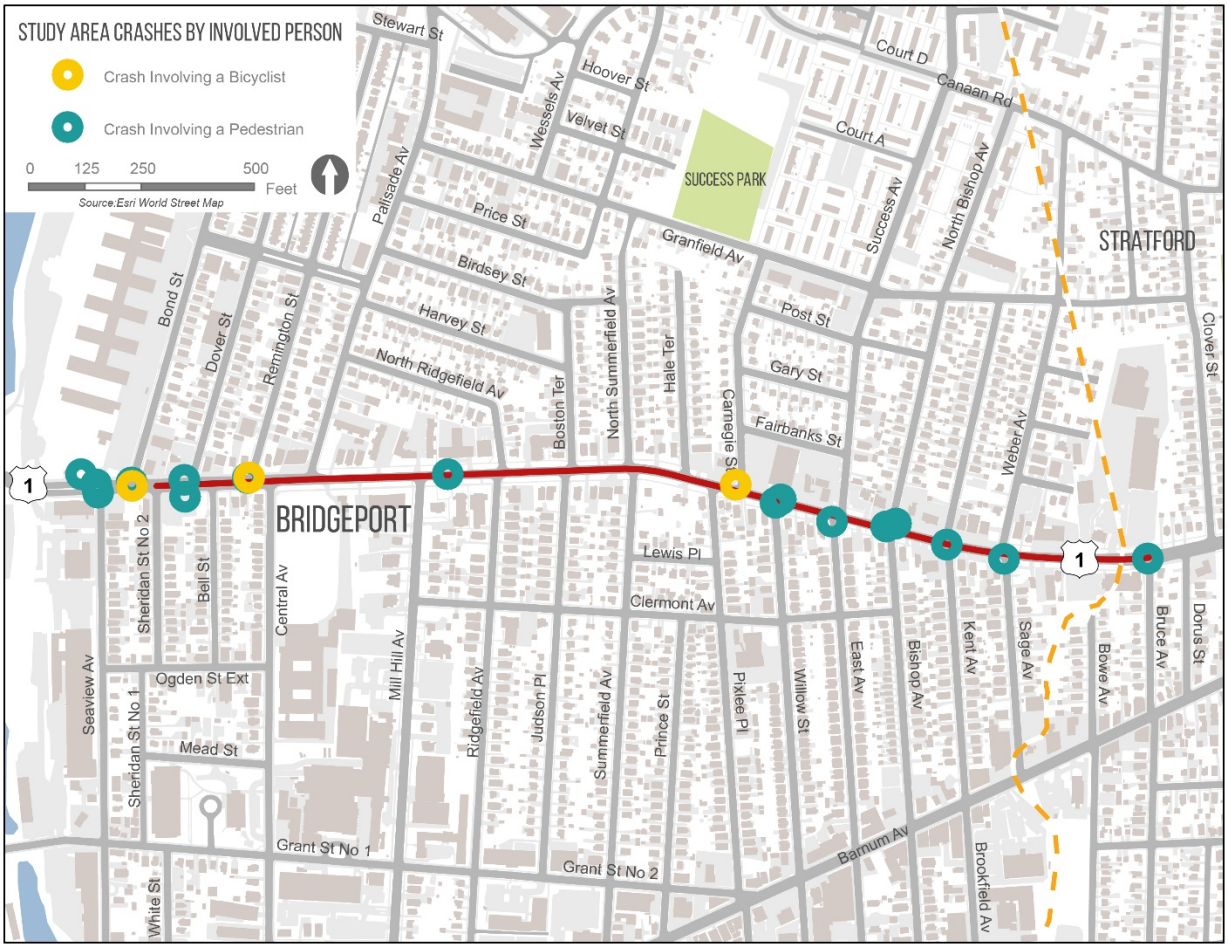
- Majority of crashes are Front to Rear (Rear End) Crashes that are typical of an area with many intersections and curb cuts, driveways, etc.





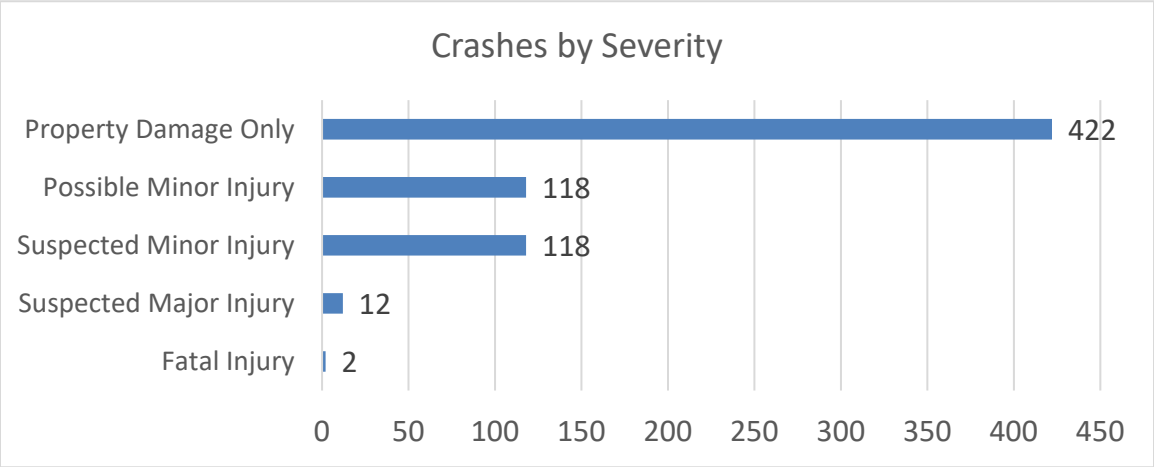
Bridgeport Road Safety Audit Crash Summary - Crashes by Involved Person

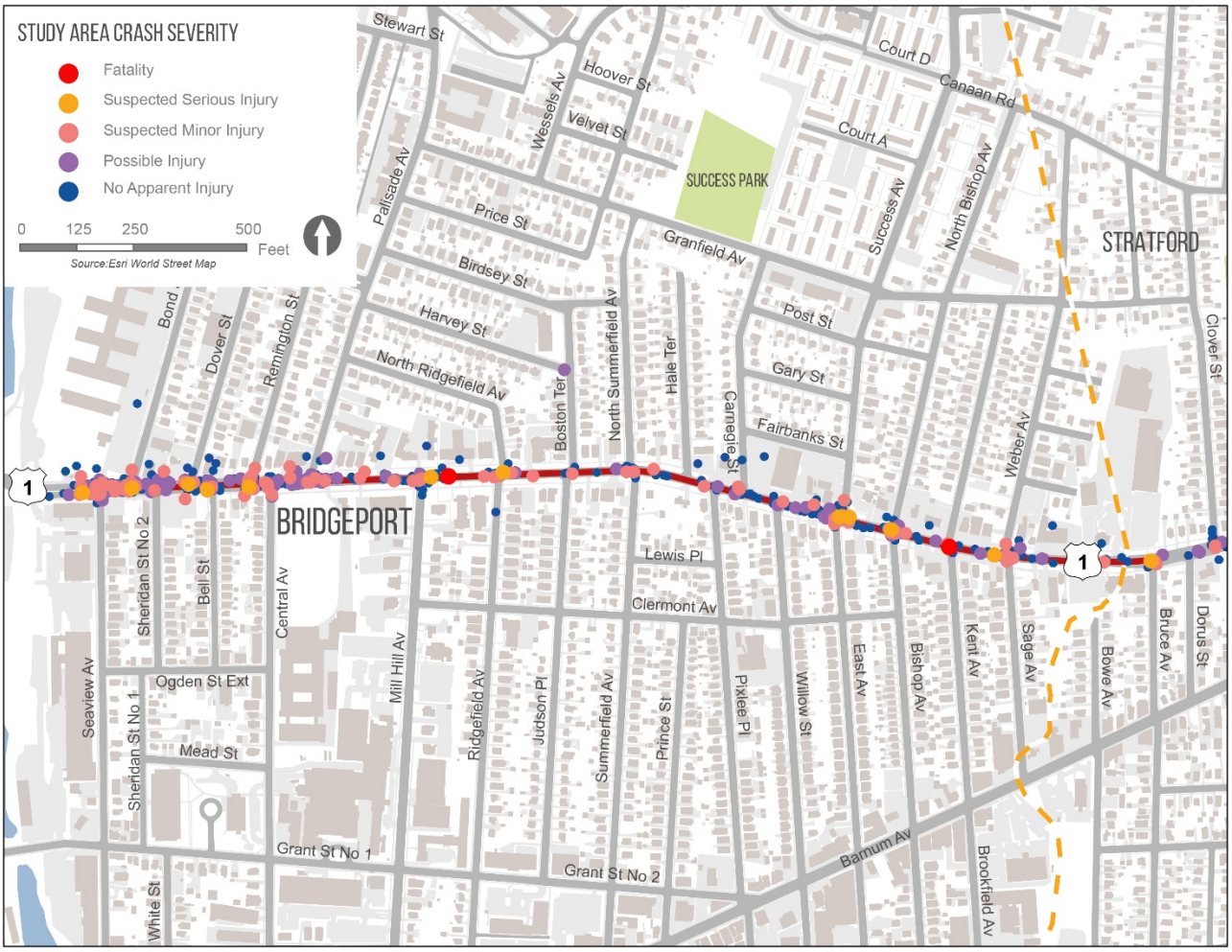
- There were three crashes involving bicyclists in the Study Area
- There were 16 crashes involving pedestrians in the Study Area. Two of which resulted in fatalities



Bridgeport Road Safety Audit Crash Summary - Crash Severity

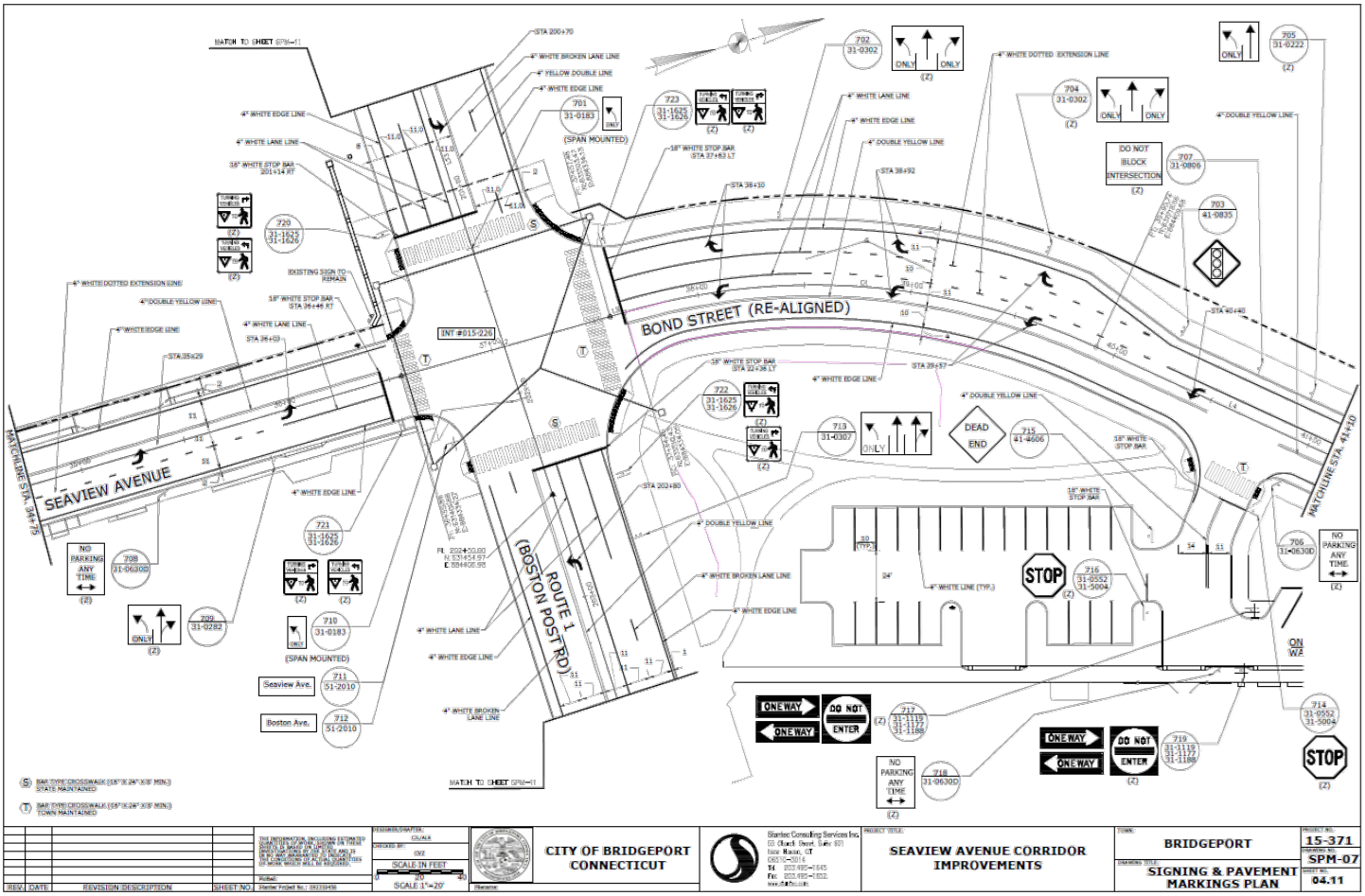
- Majority of crashes are classified as No Apparent Injury- Property Damage Only
- There were 250 crashes resulting in at least one injury with 14 crashes resulting in a major injury or fatality





Bridgeport Road Safety Audit – Review of Past and Current Work

- Study Area identified in the Active CT Project
- Route 1 and Seaview Avenue Intersection redesign underway



Bridgeport Road Safety Audit - Post Audit Discussion Guide

Safety Issues:

- Confirmation of safety issues identified during the pre-audit meeting and the walk audit

Potential Recommendations to Address Issues:

- **Short Term Recommendations**

- **Medium Term Recommendations**

- **Long Term Recommendations**

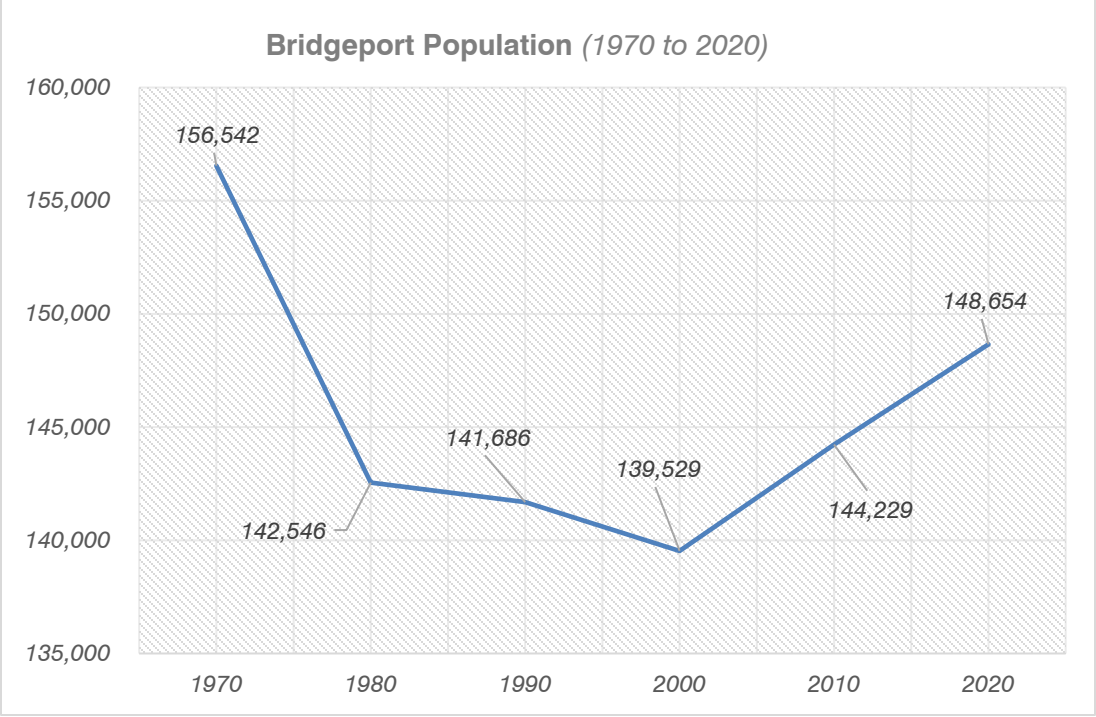
Next Steps

- Discussion involving implementation strategies and responsibilities and funding sources

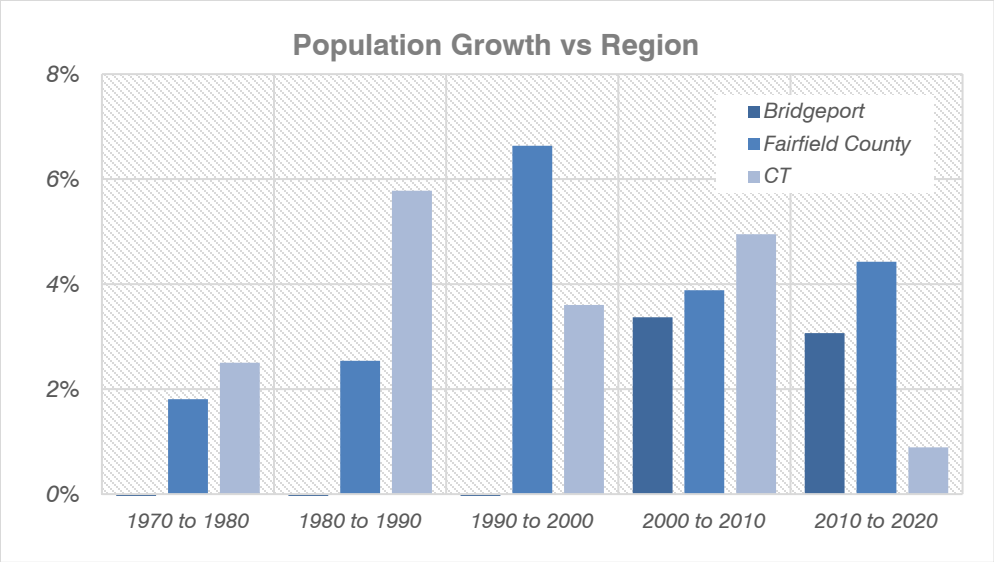
Bridgeport Road Safety Audit – Bridgeport Fact Sheet

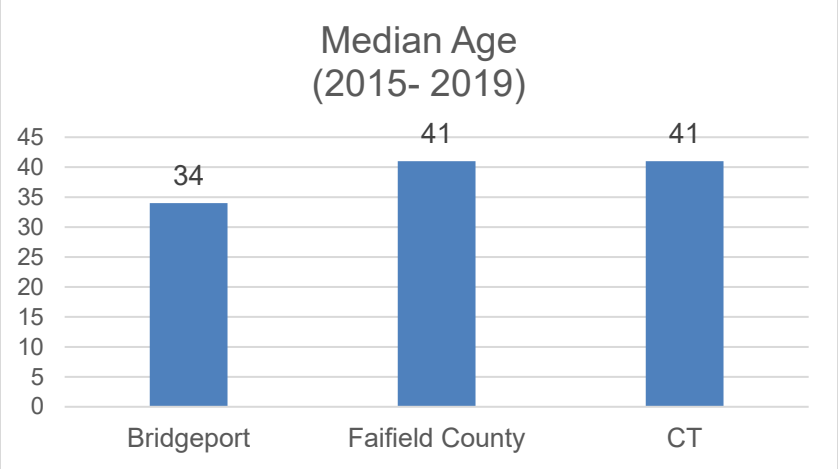
Demographic Highlights[1]:

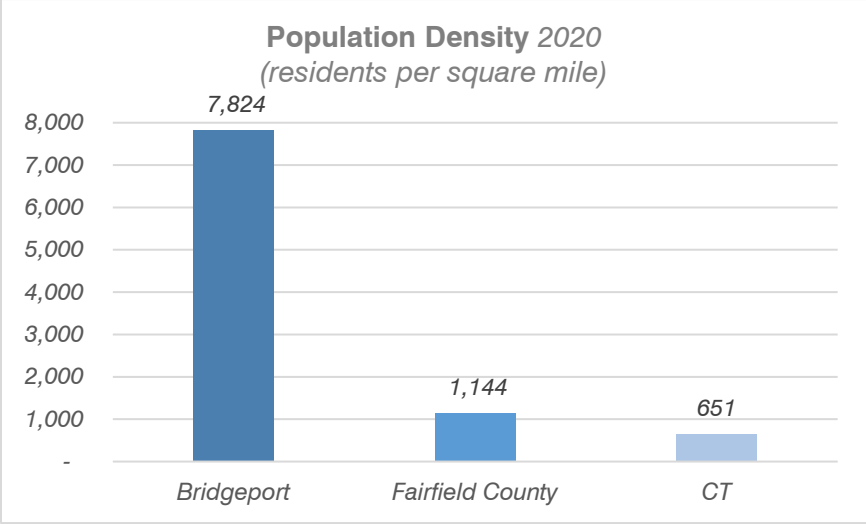
- Total population in Bridgeport is 148,654. It is Connecticut's largest City. (population).
- Bridgeport has fallen behind Fairfield County and the State in population growth between 1970 and 2010. Both Bridgeport and Fairfield County have increased in population since 2000.The State has decreased in population since 2010.
- There are approximately 7,824 residents per square mile in Bridgeport, making it nearly seven times denser than Fairfield County. It is twelve times denser than the State.
- The median age in Bridgeport is 34, which is seven years younger than that of Fairfield County, and seven years younger than the State's median age.
- Bridgeport's non-white population makes up over 60.4% of the total population. This is over two times that of Fairfield County's non-white population (28.1%) and well over the State's non-white population (24.7%).
- The poverty rate in Bridgeport is nearly 22%, which is above Fairfield County's 8.9% and the State's 9.9%.

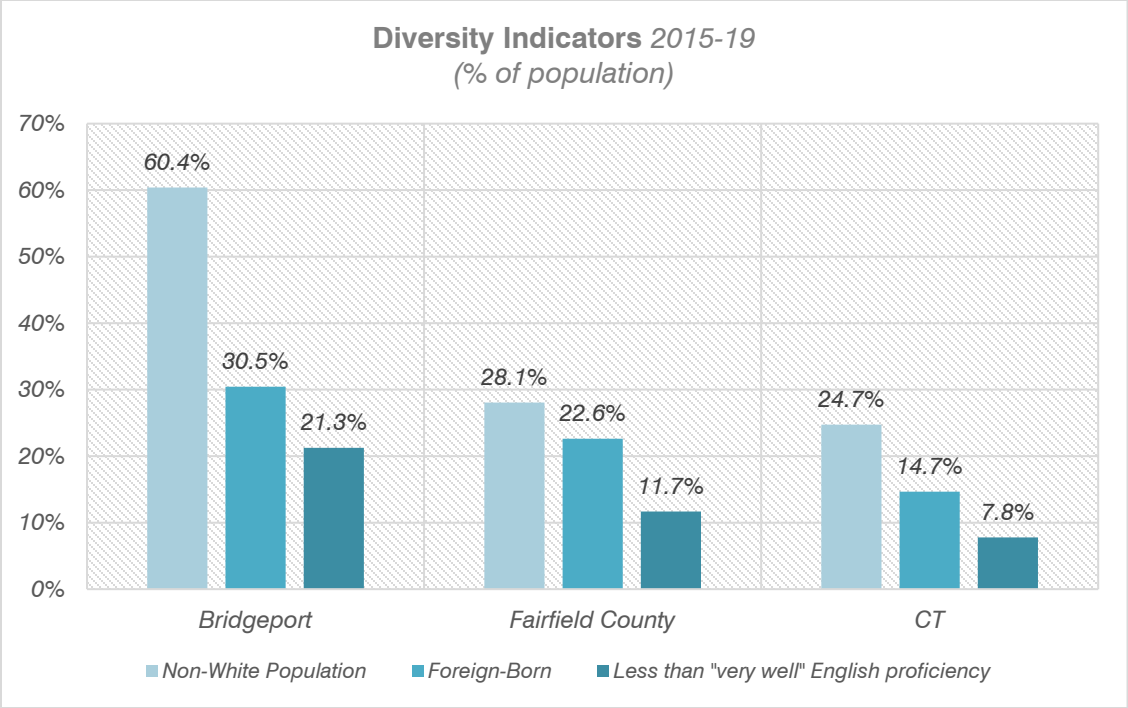


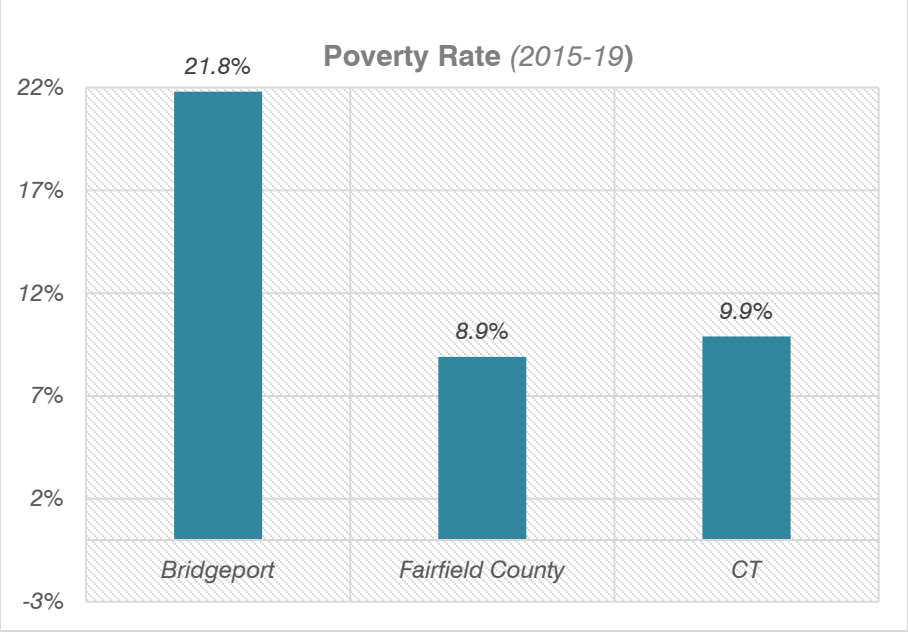
[1] 2015- 2019 American Community Survey, 5- year estimate table DP05, Accessed on 3/5/2021 at https://data.census.gov/cedsci/


Population Growth vs Region
8%
6%
4%
2%
0%
Bridgeport
Fairfield County
CT
1970 to 1980
1980 to 1990
1990 to 2000
2000 to 2010
2010 to 2020


Median Age
(2015- 2019)
45
40
35
30
25
20
15
10
5
0
34
41
41
Bridgeport
Faifield County
CT


Population Density 2020
(residents per square mile)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
-
7,824
1,144
651
Bridgeport
Fairfield County
CT

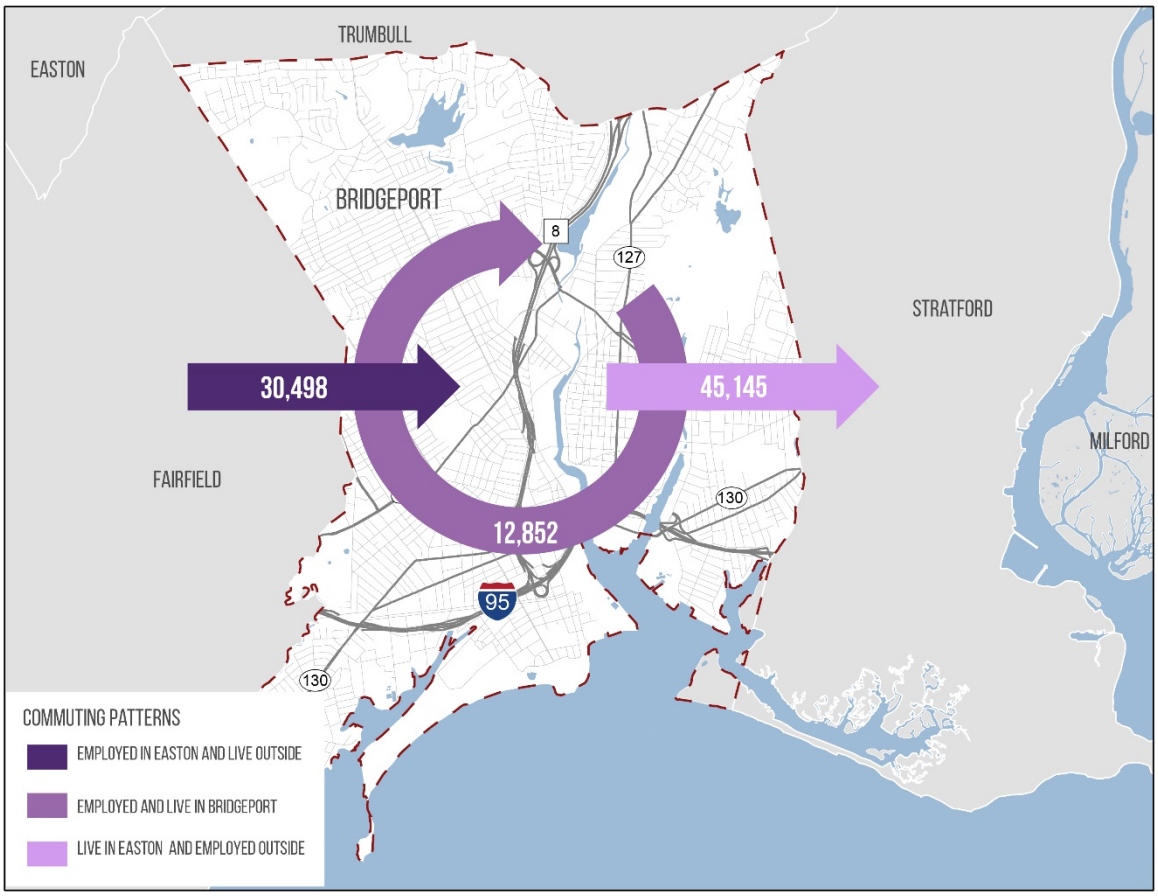

Diversity Indicators 2015-19
(% of population)
70%
60%
50%
40%
30%
20%
10%
0%
60.4%
30.5%
21.3%
28.1%
22.6%
11.7%
24.7%
14.7%
7.8%
Bridgeport
Fairfield County
CT
Non-White Population
Foreign-Born
Less than "very well" English proficiency


Poverty Rate (2015-19)
22%
17%
12%
7%
2%
-3%
21.8%
8.9%
9.9%
Bridgeport
Fairfield County
CT

Bridgeport Road Safety Audit – Bridgeport Fact Sheet

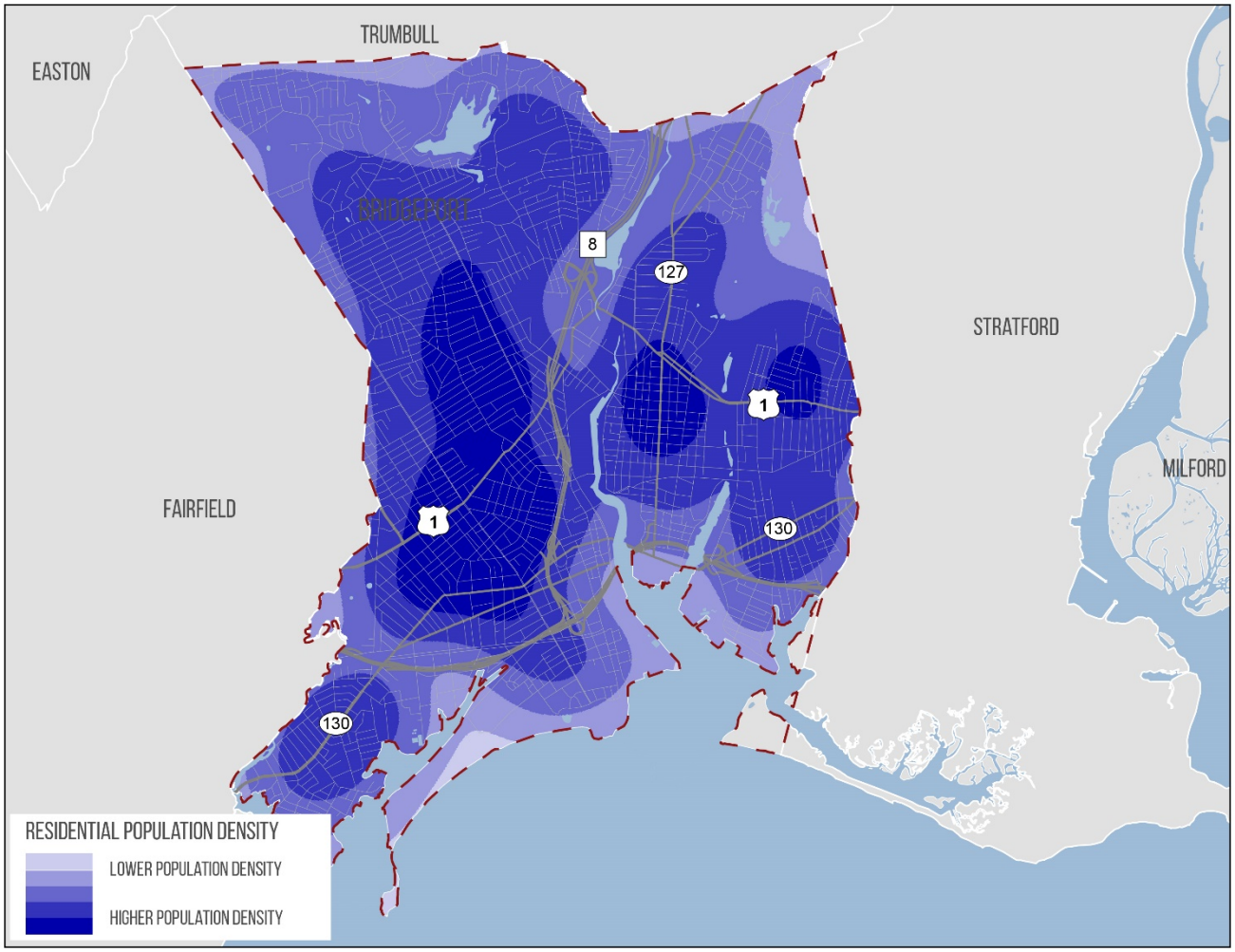
Employment Highlights[2]:

- There were approximately 30,498 workers commuting into Bridgeport for employment in 2018. Approximately 12,852 residents of Bridgeport are also employed in Bridgeport and 45,145 Bridgeport residents commuted out of the city for employment. (2018)
- The top five employment destinations for Bridgeport's residents include:
    - Bridgeport
    - Stratford
    - Shelton
    - Milford
    - Trumbull
- The Study Area and surrounding neighborhoods have a high population density. Although not located in Bridgeport's City Center, the Study Area is very dense with a high population of jobs.



[2] U.S. Census Bureau. (2021). LEHD Origin-Destination Employment Statistics (2002-2018) All Jobs. Washington, DC: U.S. Census Bureau, Longitudinal-Employer Household Dynamics Program, accessed on October 18th,2021 at https://onthemap.ces.census.gov. LODES 7.5

Residential Population Density



Bridgeport Road Safety Audit – Location Highlights

- Roadway functional classifications near the Study Area are as follows:
    - Route 1 (Boston Avenue) – Principal Arterial
    - Seaview Avenue, Grant Street, Barnum Avenue – Minor Arterial
    - Palisade Avenue, Granfield Avenue, Success Avenue, Central Avenue, East Avenue – Collector
- Traffic volumes in the Study Area vary between 21,700 vehicles per day on Route 1, west of Central Avenue to14,300 vehicles per day on Route 1 between East Avenue and the Stratford Town Line.