

# NORTH BRANFORD ROAD SAFETY AUDIT

ROUTE 22 (FOREST ROAD) & ROUTE 17 (MIDDLETOWN AVENUE)



JUNE 2023

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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 (RSA) 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.

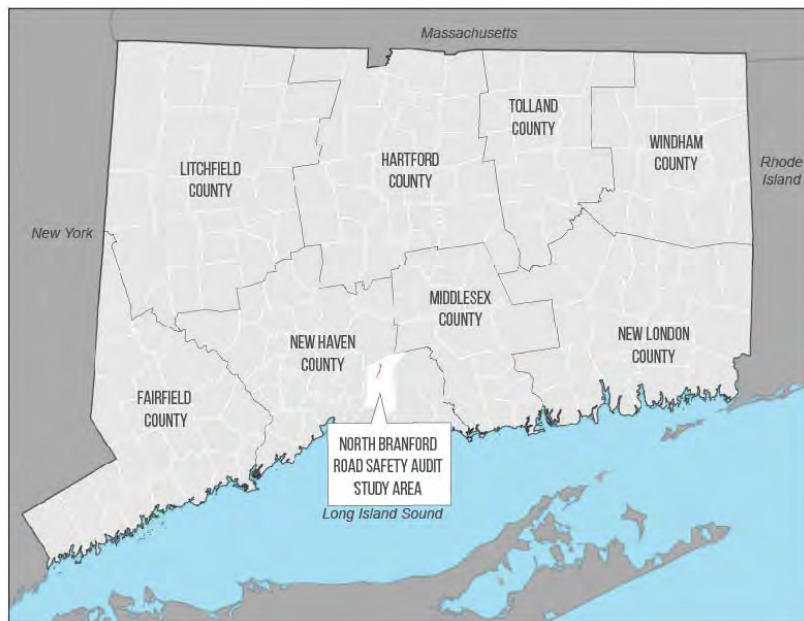
Prior to the site visit, area topography, land use characteristics, intersection sight distance concerns, sidewalk locations, parking, and bicycle facilities are examined using available mapping and imagery. The site visit includes a "Pre-Audit" meeting, the "Field Audit" itself, and a "Post-Audit" meeting to discuss the field observations and formulate recommendations. This procedure and the summary results are discussed in the following sections.

**1.2 North Branford RSA Study Area and Location**

CTDOT sponsored an RSA for the Town of North Branford for Route 22 (Clintonville Road) between Old Post Road and Forest Road and for Route 17 (also known as Middletown Avenue in the study area) between Mansfield Drive and the Recreational Department.

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: A map of the North Branford RSA location in context to the region*



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 functions primarily as

arterial roads for the town collecting traffic from collector streets, and Route 17 is classified as a Principal Arterial and Route 22 is classified as a Minor Arterial roadway. Route 17 connects to New Haven and Route 22 connects to North Haven. Exhibit 3 displays several points of interest along the corridor.

Route 22 connects North Branford to points west and south of the study area, while Route 17 connects North Branford to points north-east and south-west. The study area has some sidewalks and two crosswalks on the east side of the study area with no sidewalk network on the west side. These gaps in the pedestrian network are despite RSA participants noting that the study area is utilized by pedestrians in all parts of the study area. There is no designated signage or facilities for cyclists to utilize along study area roadways.

Average Daily Traffic (ADT) in the study area ranges between 5,000 vehicles per day and 11,800 per day along Route 17 and between 9,100 vehicles per day and 12,200 vehicles per day on Route 22.

Exhibit 4 displays daily traffic in the study area. There are two signalized intersections in the study area, at the intersection of Route 22 and Route 17 at Ardsley Avenue and the intersection of Route 17 and Mansfield Drive near the library. All other intersections are two-way stop controlled, including the intersection of Route 22 with Route 17 north of Ardsley Avenue.

Exhibit 2: The North Branford RSA study area



Exhibit 3: Study area points of interest



Exhibit 4: Average Daily Traffic (ADT) volumes



## 2 PRIOR EFFORTS IN STUDY AREA

### 2.1 SCRCOG Route 22 Corridor Planning Study

The study area has been studied in 2006 by the South Central Regional Council of Governments (SCRCOG) as part of their Route 22 Planning Study. This plan identified issues at both the Old Post Road and Forest Road intersections citing “undesirable and unusual geometry”. The Route 22 and Route 17 intersection at Forest Road and Middletown Avenue cites safety issues for pedestrians and insufficient storage space for tractor trailers resulting in impeded through traffic movements. The study resulted in two concepts for the Forest Road intersection and three concepts for the Old Post Road intersection, see Exhibits 5 and Exhibit 6 for concepts in that plan. Ultimately, none of the concepts at Old Post Road proved feasible. The Forest Road intersection concepts included options for a roundabout and a parallel commercial street to Route 22 and Route 17. The plan can be accessed at [https://scrcog.org/wp-content/uploads/2023/03/2006\\_route-22-Corridor-Planning-Study.pdf](https://scrcog.org/wp-content/uploads/2023/03/2006_route-22-Corridor-Planning-Study.pdf)

Exhibit 5: Concept A improvements at Route 22 – Route 17 intersection at Northford Center from the SCRCOG Route 22 Corridor Planning Study



Exhibit 6: Concept B improvements at Route 22 – Route 17 intersection at Northford Center from the SCRCOG Route 22 Corridor Planning Study



## 2.2 North Branford Plan of Conservation and Development

The North Branford Plan of Conservation and Development, completed by the town in 2019, lays out the vision for the town and its priorities for the following ten years. The plan includes an identification of areas of concern and opportunity for bicycle and pedestrian infrastructure at a local level. This plan identified several planning priorities relevant to this RSA, including:

- Chapter 7: Support a safe, appropriate, and connected transportation network for all users
  - Route 17 is a state-designated bicycle route, but it lacks the wide shoulders needed to safely separate bicycles from vehicular traffic
  - Most community respondents cited a desire for more sidewalks (67%) and bike trails or bike lanes (56%)
  - Recommended strategies: Incorporate five-foot bicycle shoulders on state roadways as part of future improvement projects. Priority should be given to Route 17, which is a state designated bicycle route

Exhibit 7 shows an overview of crash hotspots in the region. The plan can be accessed at

<https://www.northbranfordct.gov/DocumentCenter/View/226/Town-Plan-of-Conservation-and-Development---Effective-October-18-2019-PDF>

Exhibit 7: Crash hotspot map from the 2019 Town of North Branford Plan of Conservation and Development



Source: Connecticut Crash Data Repository



### 3 PRE-AUDIT MEETING

#### 3.1 Pre-Audit Information

The RSA team conducted a pre-audit meeting in the afternoon of Wednesday, June 21, 2023. The RSA team presented a brief presentation that included an overview of the North Branford 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 is 35 miles per hour (mph) within the study area along Route 22 and Route 17. Exhibit 8 displays speed limits in the study area.

85<sup>th</sup> percentile speeds were consistent at 38.0 mph on Route 22 throughout the study area from the Recreation Department to Old Post Road. The highest speeds are found on Route 17 near Mansfield drive, where 85<sup>th</sup> percentile speeds are 48 mph.

Exhibit 8: Study area speed limits



**Crashes:** Based on data retrieved from the Connecticut Crash Data Repository (CTCDR) for the five-year period between January 2017 through December 2021, there were a total of 73 crashes in the North Branford RSA study area. Crashes were concentrated at the northern intersection of Route 22 and Route 17, on Route 17 at Mansfield Drive and on Route 22 near the Old Post Road intersection. Exhibit 9 displays the study area crash summary and Exhibit 10 displays a study area crash heatmap.

Exhibit 9: Study area crash summary

	Fatality (K)	Serious Injury (A)	Minor Injury (B)	Possible Injury (C)	Property Damage Only (O)	TOTAL
Angle		1	2	4	18	25
Front to front						0
Front to rear				3	35	38
direction						0
Sideswipe, same direction					3	3
Rear to Side					1	1
Rear to Rear					1	1
Not Applicable				1	3	4
Other					1	1
<b>TOTAL</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>62</b>	<b>73</b>

Exhibit 10: Study area crash heatmap



**Crashes by Type:** Most crashes (62 out of 73) are classified as having a “Front to Rear” or “Angle” manner of impact, which are common of crashes near intersections. The rates of all other crash types were low, with the other nine (9) crashes being distributed between rear to side, rear to rear, other, not applicable, and sideswipe crashes. Exhibit 11 and Exhibit 12 display the location and crashes by type in the corridor.

Exhibit 11: Crashes by type

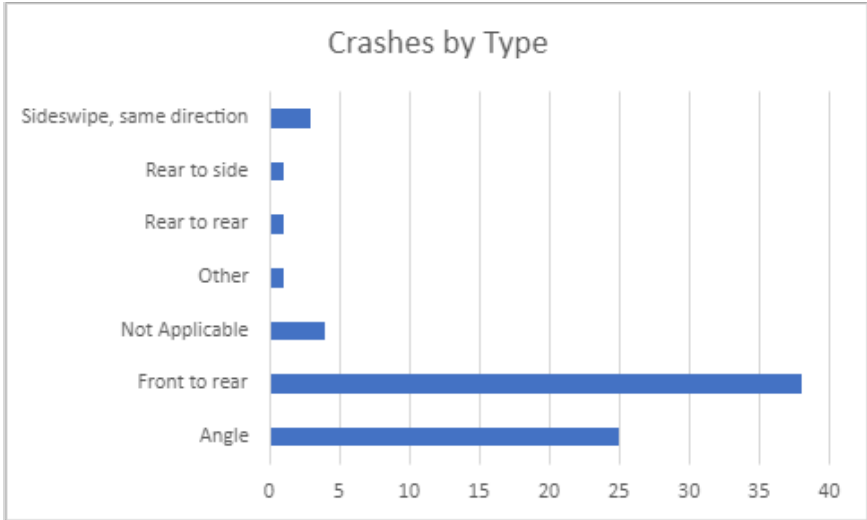
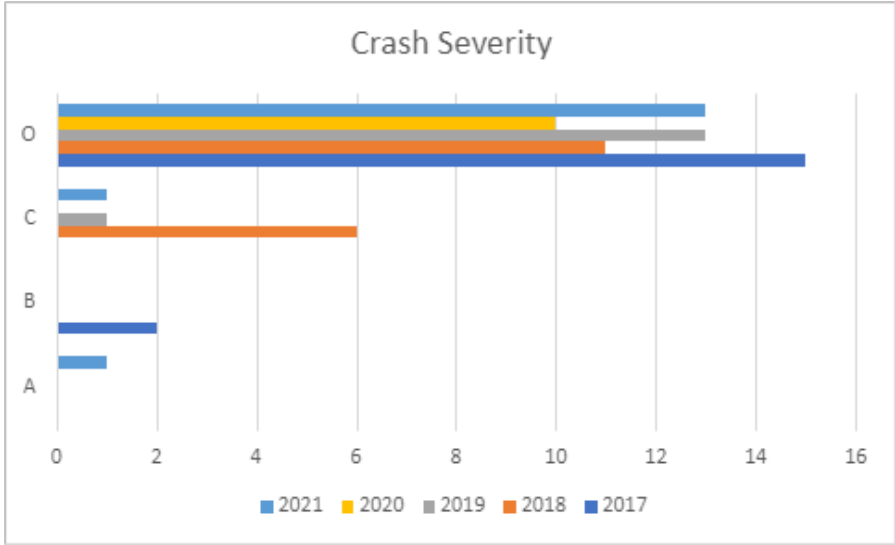


Exhibit 12: Crashes by type by location

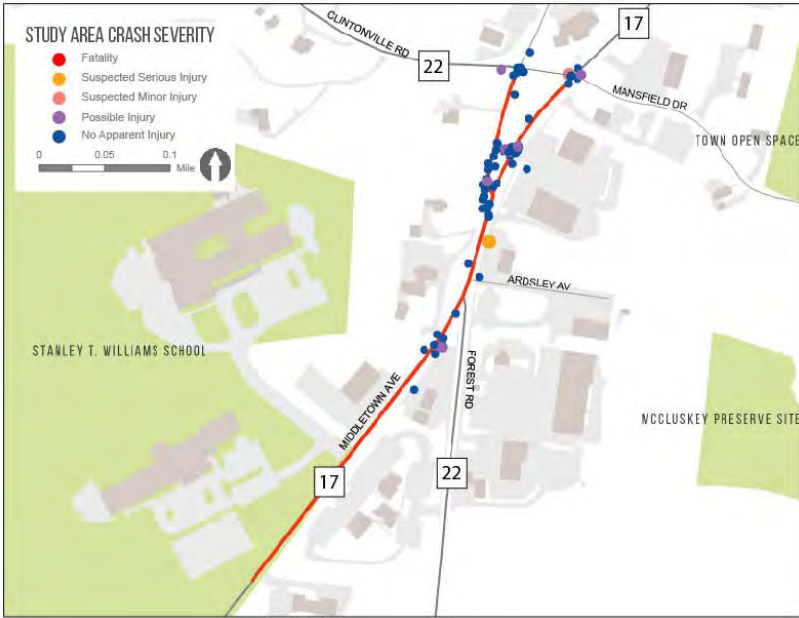


**Crash Severity:** There were 62 crashes resulting in no apparent injury in the study area, with eight (8) possible injuries and two (2) minor injury crashes. Of the 73 crashes, 85% (62 out of 73) of crashes resulted in property damage only. Three (3) of the crashes which resulted in injury occurred on Route 17 between Mansfield drive and Ardsley Avenue, while another six (6) crashes resulting in possible injury occurred at the northern Route 22 and Route 17 junction near Old Post Road. Exhibit 13 and Exhibit 14 shows a summary of total crashes by severity and crash severity by location.

*Exhibit 13: Crash severity summary (Coded as: O – Property Damage Only, C – Possible Injury, B – Suspected Minor Injury, A – Suspected Serious Injury)*



*Exhibit 14: Crash severity by location*



**Crashes by Involved Person:** There were no recorded crashes in the North Branford RSA study area involving a bicyclist or a pedestrian.

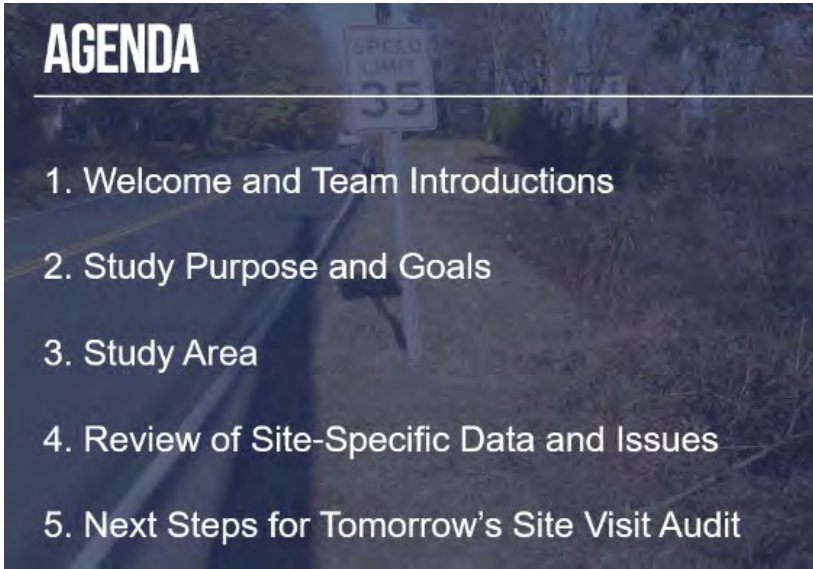
### 3.2 Pre-Audit Discussion

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

- SCRCOG will be including North Branford in the next iteration of the Unified Planning Work Program
- The Town desires bike infrastructure on the state-designated bike route of Route 17
- The Town wants Northford Center to feel like more of a commercial and town center that supports pedestrian traffic throughout the corridor

Sample slides from the pre-audit presentation are shown in Exhibit 15.

Exhibit 15: Sample slides from pre-audit presentation



## 4 RSA ASSESSMENT

The following summary describes observations and discussion regarding issues and concerns throughout the North Branford RSA study area. Exhibit 16 shows RSA participants engaging in conversation during the RSA. Discussions were held at each of the noted locations below.

*Exhibit 16: RSA participants gathered at the start of the walking route*



### 4.1 Route 22 (Forest Road) between 853 Forest Road (Shell Gas) and Route 17 (Middletown Avenue)

- The RSA team started our walking tour at the parking lot on Ardsley Avenue and walked the segment on Forest Road to the Shell gas station. This segment has some of the highest ADT in the study area and there is a desire on behalf of RSA participants to make this area

near Northford Center more pedestrian friendly. Exhibit 17 shows this area.

*Exhibit 17: Route 22 looking south on Forest Road from the Shell gas station*



### 4.2 Route 17 (Middletown Avenue) between Stanley Williams Community Center and Route 22 (Forest Road)

- This area is a crash hotspot on the study area heat map. See Exhibit 10.
- RSA participants noted that they would like to connect this area to the rest of Northford Center for pedestrians.
- CTDOT's Americans with Disabilities Act (ADA) team gave input on how to make access to the school ADA-compliant. See Exhibits 18 and 19.
  - Need for better visibility
  - ADA-compliant ramps and landing areas should be installed at the existing crosswalk shown in Exhibit 19.

- Taking width from the west side of Route 17 should be considered to allow for an expanded sidewalk and bike lane network.
- The RSA team noted at the firehouse on Route 17 and lighting should be considered for better visibility.

Exhibit 18: Route 17 entrance to Totoket Elementary School and North Branford Recreational Department



Exhibit 19: Crosswalk at the Totoket Elementary School entrance on Route 17



#### 4.3 Southern intersection of Route 17 (Middletown Avenue) and Route 22 (Forest Road)

- This intersection is the southern intersection of Route 17 and Route 22 in the study area.
- Participants asked about the amount of curb cuts at the gas station and minimizing access to allow for a better geometry at the intersection.
- Participants also noted the signs at the intersection blocking the bike route sign and their desire for the bike route on Route 17 to be more visible. Exhibit 20 displays the signs.

- Intersection geometry should be looked at in partnership or cooperation from the neighboring business (gas station). Exhibit 21 displays this area.

Exhibit 20: State road markers blocking bike route sign



Exhibit 21: Current road geometry of Route 22 and Route 17 southern interchange at Shell gas station



#### 4.4 Route 17 in front of St. Andrews Episcopal Church

- The entrance to St. Andrews Episcopal Church creates conflict points with the Route 22 and Route 17 intersection.
- RSA participants said that pedestrians do not cross from the church noting the west side of the corridor is not a safe experience for pedestrians. There is a no pedestrian sign at this point and it is difficult to cross here, as displayed in Exhibit 22.



*Exhibit 22: Route 17 St. Andrews Episcopal Church entrance*



#### 4.5 Northern Intersection of Route 17 (Middletown Avenue) and Route 22 Eastbound

- This intersection is a hotspot for crashes on the heat map for the study area, as shown in Exhibit 10.
- Route 22 eastbound gets (left side on Exhibit 23) backed up frequently during peak and off-peak hours. Exhibit 24 displays the traffic at the time of the RSA field audit (about noon).
- Due to the intersection of two major state roadways and the awkward geometry for travelers on Route 22, traveling south bound through this section of the study area is not amenable to pedestrians or bicyclists.
- RSA participants said that pedestrians would have the best experience on the east sidewalk of the study area Mansfield Drive to Northford Center.
- RSA participants expressed a strong desire to have infrastructure to support safe passage for cyclists and pedestrians in this area between Northford Center and Route 22 and Route 17 connecting to this area.

Exhibit 23: Route 17 and Route 22 northern Intersection near St. Andrews Church (left)



Exhibit 24: Route 17 and Route 22 northern Intersection across from Rite Aid driveway; Left turn lane from Route 22 southbound to turn onto Route 17 northbound



#### 4.6 Route 17 (Middletown Avenue) Ardsley Avenue to Mansfield Road

- Currently the sidewalk network has both old and new concrete with gaps along the walking route. RSA participants shared concerns about the safety of bicyclists and pedestrians on some areas of Route 22. Exhibit 25 and 26 show obstructions on the sidewalk network that create difficulties for pedestrians in the corridor.
- There is a desire to complete the sidewalk network on the east side of the corridor. Exhibit 27 displays a gap along the east side of the study area.

Exhibit 25: Overgrown trees on the sidewalk network approaching Northford Center



Exhibit 26: Sign leaning into the sidewalk network on Route 17



Exhibit 27: No sidewalks near the Ardsley Avenue intersection



- 4.7 Route 22 (Clintonville Road) and Old Post Road intersection
- Clintonville Road slopes downward toward the curb near Old Post Road. RSA participants said that this leads to higher speeds along this curve. Sightlines are also a concern at this intersection, as displayed in Exhibit 28.
  - Route 22 southbound experienced long queues during our field audit during non-peak hours. Storage capacity should be reviewed.

*Exhibit 28: Route 22 Clintonville Road and Old Post Road intersection (Left)*



- The driveway configuration at 1409 Middletown Avenue (Guilford Savings Bank) is located near the stop light causing drivers to not stop at the “stop here on red” sign and block the drive through entrance.
- There is a school bus stop near this intersection that serves about 30+ children per day (*Exhibit 28*)

*Exhibit 29: Route 17 and Mansfield Drive intersection on the right*



#### 4.8 Route 17 (Middletown Avenue) at Route 22 westbound (Clintonville Road) and Mansfield Drive intersection

- This intersection has a downhill slope on Route 22 towards Mansfield Drive, as seen in Exhibit 29.
- The sidewalk ends at the sidewalk ramp on the northwest corner of this intersection. However, this curb ramp is not connected to the public library. RSA participants said that there should be an accessible connection between the library and the sidewalk network. Pedestrian landing is shown on Exhibit 30. CTDOT’s ADA team measured the slope of the landing for ADA-compliance, which is a 2% slope maximum. The landing at the intersection was slightly above that standard. Exhibit 31 displays two photos of this sidewalk.

Exhibit 30: View of the crosswalk at Route 17 intersection at Mansfield Drive and bank in the background



Exhibit 31: Sidewalk connection to the library doesn't exist on the northwest corner of the intersection (left). CTDOT's ADA team checking the slope at the northwest corner



## 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. Additionally, the report presents a conceptual plan for the study area of Route 17 and Route 22 from Old Post Road to the North Branford Recreation Department. This location was selected because of the nature of recommendations in this area. Depiction of this area with a conceptual plan does not reduce the importance of other areas identified in this report and does not indicate that this area is of higher priority than other recommendations in this report.

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 North Branford Local Traffic Authority (Chief of Police).

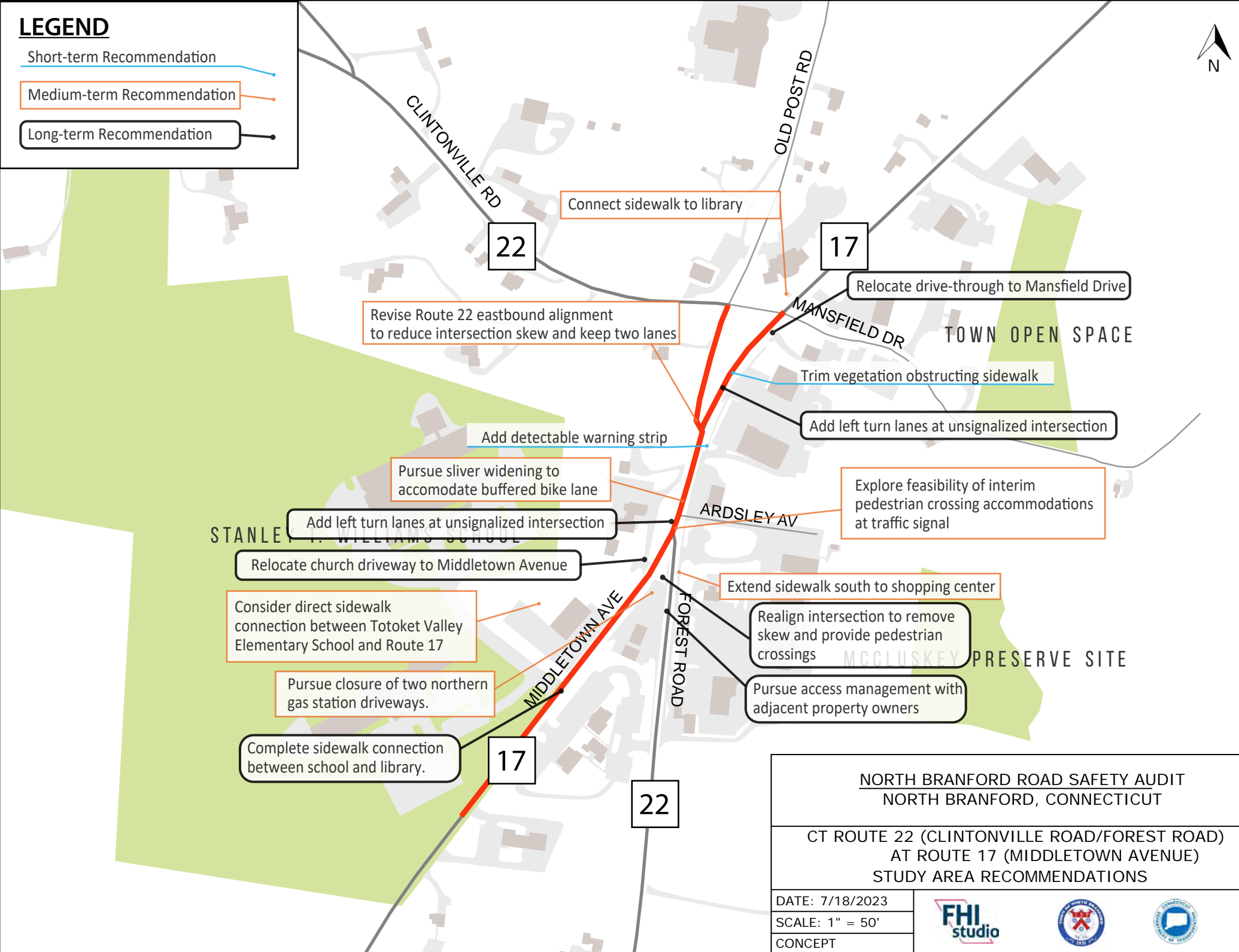
Exhibit 32 displays the recommendations of the overall study area on a map. Exhibits 33 and 34 shows conceptual recommendations of the area as well.

# LEGEND

Short-term Recommendation

Medium-term Recommendation

Long-term Recommendation



Connect sidewalk to library

22

17

Relocate drive-through to Mansfield Drive

Revise Route 22 eastbound alignment to reduce intersection skew and keep two lanes

Trim vegetation obstructing sidewalk

Add left turn lanes at unsignalized intersection

Add detectable warning strip

Pursue sliver widening to accommodate buffered bike lane

Explore feasibility of interim pedestrian crossing accommodations at traffic signal

Add left turn lanes at unsignalized intersection

ARDSLEY AV

Relocate church driveway to Middletown Avenue

Extend sidewalk south to shopping center

Consider direct sidewalk connection between Totoket Valley Elementary School and Route 17

Realign intersection to remove skew and provide pedestrian crossings

Pursue closure of two northern gas station driveways.

Pursue access management with adjacent property owners

Complete sidewalk connection between school and library.

17

22

## NORTH BRANFORD ROAD SAFETY AUDIT NORTH BRANFORD, CONNECTICUT

### CT ROUTE 22 (CLINTONVILLE ROAD/FOREST ROAD) AT ROUTE 17 (MIDDLETOWN AVENUE) STUDY AREA RECOMMENDATIONS

DATE: 7/18/2023  
SCALE: 1" = 50'  
CONCEPT



**LEGEND**

Short-term Recommendation

Medium-term Recommendation

Long-term Recommendation

Explore feasibility of interim pedestrian crossing accommodations at traffic signal

Add left turn lanes at unsignalized intersections.

Extend sidewalk south to shopping center.

Relocate church driveway to Middletown Avenue.

Consider direct sidewalk connection between Totoket Valley Elementary School and Route 17

Pursue closure of two northern gas station driveways.

Realign intersection to remove skew and provide pedestrian crossings

Complete sidewalk connection between school and library.

Pursue access management in concert with adjacent property owners.

**NORTH BRANFORD ROAD SAFETY AUDIT  
NORTH BRANFORD, CONNECTICUT**

**EXHIBIT 33: RTE 17 AT RTE 22 (SOUTH)  
CONCEPT PLAN**

DATE: 6/30/2023

SCALE: 1" = 50'

CONCEPT



SCALE IN FEET

0 50 100

GRAPHIC SCALE





**LEGEND**

Short-term Recommendation

Medium-term Recommendation

Long-term Recommendation



Connect sidewalk to library.

Stripe Route 22 approach to add a second lane

Revise Route 22 eastbound alignment to reduce intersection skew.

Relocate drive-through to Mansfield Drive.

Trim vegetation obstructing sidewalk.

Add left turn lanes at unsignalized intersections.

Pursue access management in concert with adjacent property owners.

Add detectable warning strips.

Pursue sliver widening to accommodate buffered bike lane.

**NORTH BRANFORD ROAD SAFETY AUDIT  
NORTH BRANFORD, CONNECTICUT**

**EXHIBIT 34: RTE 17 AT RTE 22 (NORTH)  
CONCEPT PLAN**

DATE: 6/30/2023  
SCALE: 1" = 50'  
CONCEPT



**5.1 Route 22 (Forest Road) between 853 Forest Road (Shell Gas) and Route 17 (Middletown Avenue)**

Route 22 (Forest Road) near the Shell gas station does not have a sidewalk. Vehicular traffic volume is very high along this section of the study area and needs both accessible driveways to neighboring businesses and better pedestrian infrastructure. Sidewalks and a reconfigured Route 17 (Middletown Avenue) approach at this intersection should be considered. Exhibit 33 shows a conceptual plan for this area.

*Medium-term*

- 1) Install sidewalk south of Ardsley Avenue to Northford shopping center

*Long-term*

- 1) Pursue access management with adjacent property owners
  - a) Northford Center Plaza property owners
  - b) Shell Gas Station property owners

**5.2 Route 17 (Middletown Avenue) between Stanley Williams Community Center and Route 22 (Forest Road)**

Recommendations in this area seek to improve the bicycling and pedestrian facilities on Route 17 with a narrowing of the travel lane width to CTDOT standard 11-feet and a redistribution of available shoulder width in both directions. This should be supplemented by further limited roadway widening in the long-term to allow for the installation of a standard bike lane on this state designated bike lane route. It is also recommended to consider installing a sidewalk behind the firehouse to bypass the large curb cut and provide a more direct route to the elementary school and library.

*Medium-term*

- 1) Install crosswalk and consider Rectangular Rapid Flashing Beacon (RRFB) at the school and recreation center entrance. Exhibit 35 shows an example of an RRFB.
- 2) Install ADA ramps, pedestrian push buttons, marked crosswalk, and add a pedestrian phase to the signal intersection at Route 22 and Route 17 southern Intersection (Int. No. 098-201)
- 3) Consider relocating the stop bar on Route 22 northbound further south to permit the installation of a crosswalk on the southeast leg of the intersection, if supported by a traffic analysis. Refer to main plan above.
- 4) Push the west curb on Route 17 eastward to avoid impacting the slope

*Long-term*

- 1) Consider limited roadway widening to allow for 11-foot travel lane with 5-foot bike lane in each direction
- 2) Construct sidewalk on east side of Route 17 connecting recommended crosswalk to Northford Center and the library

Exhibit 35: An example of RRFB (Source: CTDOT)



### 5.3 Southern intersection of Route 17 (Middletown Avenue) and Route 22 (Forest Road)

Recommendations at this intersection are focused on providing a safe crossing for non-motorized users, as well as a review of intersection geometry. RSA participants noted results in longer delays for Route 17 vehicles. The gas station at this corner has four driveways and should consider removal or relocation of the driveways to provide space for the reconfiguration of the intersection. Exhibit 36 details an alternative configuration for the Route 22 and Route 17 intersection that could increase safety for vehicles and pedestrians from the nearby school. Route 17 is a state designated bike route, RSA participants noted the need for more bicycle infrastructure to help riders feel safe along this route.

#### Medium-term

- 1) Pursue sliver widening to accommodate buffered bike lane on Middletown Avenue
- 2) Pursue closure of two northern gas station driveways

#### Long-term

- 1) Add left turn lanes and realign intersection no. 098-201.
- 2) Pursue access management with the gas station.
- 3) Realign southern Route 22 and Route 17 intersection to remove skew and provide pedestrian crossings. This concept is shown in Exhibit 36 and requires a full taking of this property.

Exhibit 36: Conceptual Plan of the Forest Road and Middletown Avenue intersection



**5.4 Route 17 in front of St. Andrews Episcopal Church**

This section of the study area is between the Route 17 intersections along Route 22. RSA participants stated the need for church patrons to cross the road for overflow parking. A long-term connection to the east side of the corridor from the church would be safest from the suggested sidewalk network configuration in Exhibit 36.

*Long-term*

- 1) Relocate church driveway to Middletown Avenue
- 2) Extend lawn area near firehouse and center island

**5.5 Northern Intersection of Route 17 (Middletown Avenue) and Route 22 Eastbound**

The Route 22 eastbound approach currently gets backed up to Old Post Road. Driver behavior is also a concern with the current configuration of the Route 22 approach to Route 17 with drivers using the slip lane to take a right onto Route 17. A long-term recommendation of reconfiguring this approach should be considered. See Exhibit 37 for a conceptual plan of this approach.

*Long-term*

- 1) Revise Route 22 eastbound alignment to reduce intersection skew
- 2) Stripe Route 22 approach to add a second lane.

*Exhibit 37: Conceptual plan of the reconfiguration of the Route 22 approach to Middletown Avenue*



**5.6 Route 17 (Middletown Avenue) Ardsley Avenue to Mansfield Drive**

Recommendations in this area provide a complete sidewalk network that connects Northford Center to other destinations for pedestrians including the elementary school and the library. This area of the study corridor has multiple curb cuts, and the recommendations include an elimination of a number of curb cuts. Currently the sidewalk network between Mansfield Drive and Ardsley Avenue is in good condition but needs to be extended to Forest Road to the south.

*Short-term*

- 1) Trim vegetation obstructing sidewalk

- 2) Add detectable warning strips to existing ADA compliant ramps.

*Medium-term*

- 1) Pursue sliver widening to accommodate buffered bike lane

*Long-term*

- 1) Pursue access management in coordination with adjacent property owners
- 2) Add left turn lanes at unsignalized intersections

**5.7 Route 22 (Clintonville Road) and Old Post Road intersection**

Route 22 in this area approaches the intersection at a downward slope causing speeding and minimal sightlines.

*Short-term*

- 1) Install a dynamic speed feedback sign on Route 22 eastbound (an encroachment permit for the sign installation would need to be obtained) near the Northford Congregational church to slow vehicles approaching from Clintonville Road

**5.8 Route 17 (Middletown Avenue) at Route 22 westbound (Clintonville Road) and Mansfield Drive intersection**

*Long-term*

- 1) Relocate Guilford Savings Bank driveway at 1409 Middletown Avenue to provide access only from and to Mansfield Drive
- 2) Install sidewalk from the landing area on the northwest corner of the intersection to the library entrance
- 3) Install bike lane on Route 17 continuing north

## **6 SUMMARY**

This report documents the observations, discussions, and recommendations developed during the completion of the Town of North Branford's RSA. It provides the Town 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 Town of North Branford and CTDOT may use this report to prepare strategies for funding and implementing the improvements. This report provides North Branford with a toolkit to plan for including these multi-modal recommendations into future development within the study area.

The 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

# NORTH BRANFORD ROAD SAFETY AUDIT

ROUTE 22 AND ROUTE 17



JUNE 2023



# INTRODUCTIONS



# AGENDA

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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

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- Connecticut Department of Transportation (CTDOT) is sponsoring
- Town of North Branford
- South Central Regional Council of Governments (SCRCOG)
- FHI Studio is conducting the Road Safety Audit reporting

# PURPOSE AND GOALS OF THE ROAD SAFETY AUDIT

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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

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



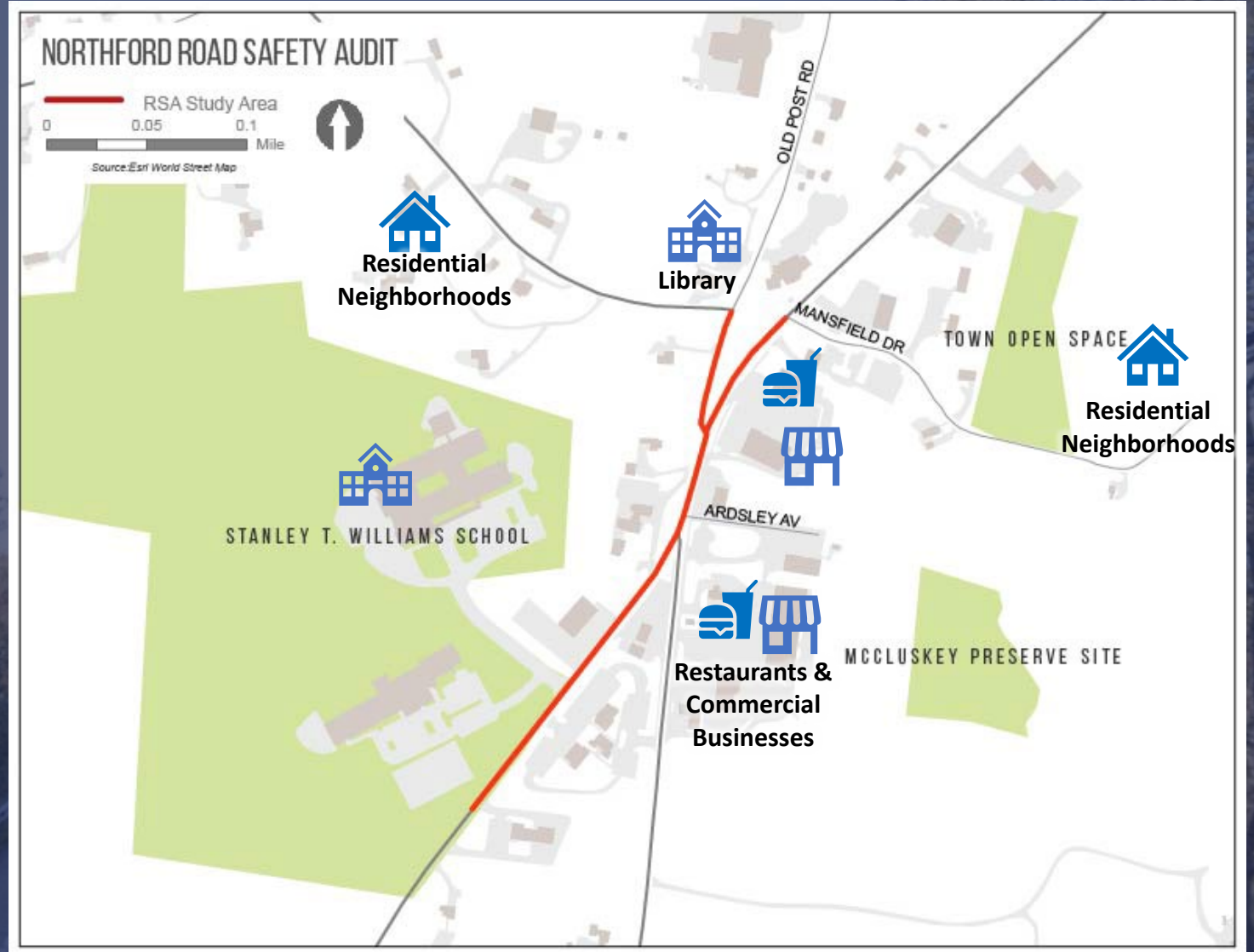
# STUDY AREA

- Route 17 Middletown Avenue north to 3 Old Post Rd.
- Route 22 between Clintonville Rd and the southern intersection at Forest Rd
- Vicinity of Northford Center



# POINTS OF INTEREST

- Northford Center
- Gas stations, small businesses, restaurants
- Three churches at south, north and center of study area
- Totoket Valley Elementary School
- Library
- Pedestrian/Bicycle Traffic



# EXISTING CONDITIONS FINDINGS

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## Route 22 and Route 17

- Pedestrian and Bicycle traffic
- Access to Northford Center— many restaurants/businesses
- Access to Churches, schools and library
- Access to I-91 through Route 22 Clintonville Road

# TRAFFIC VOLUMES

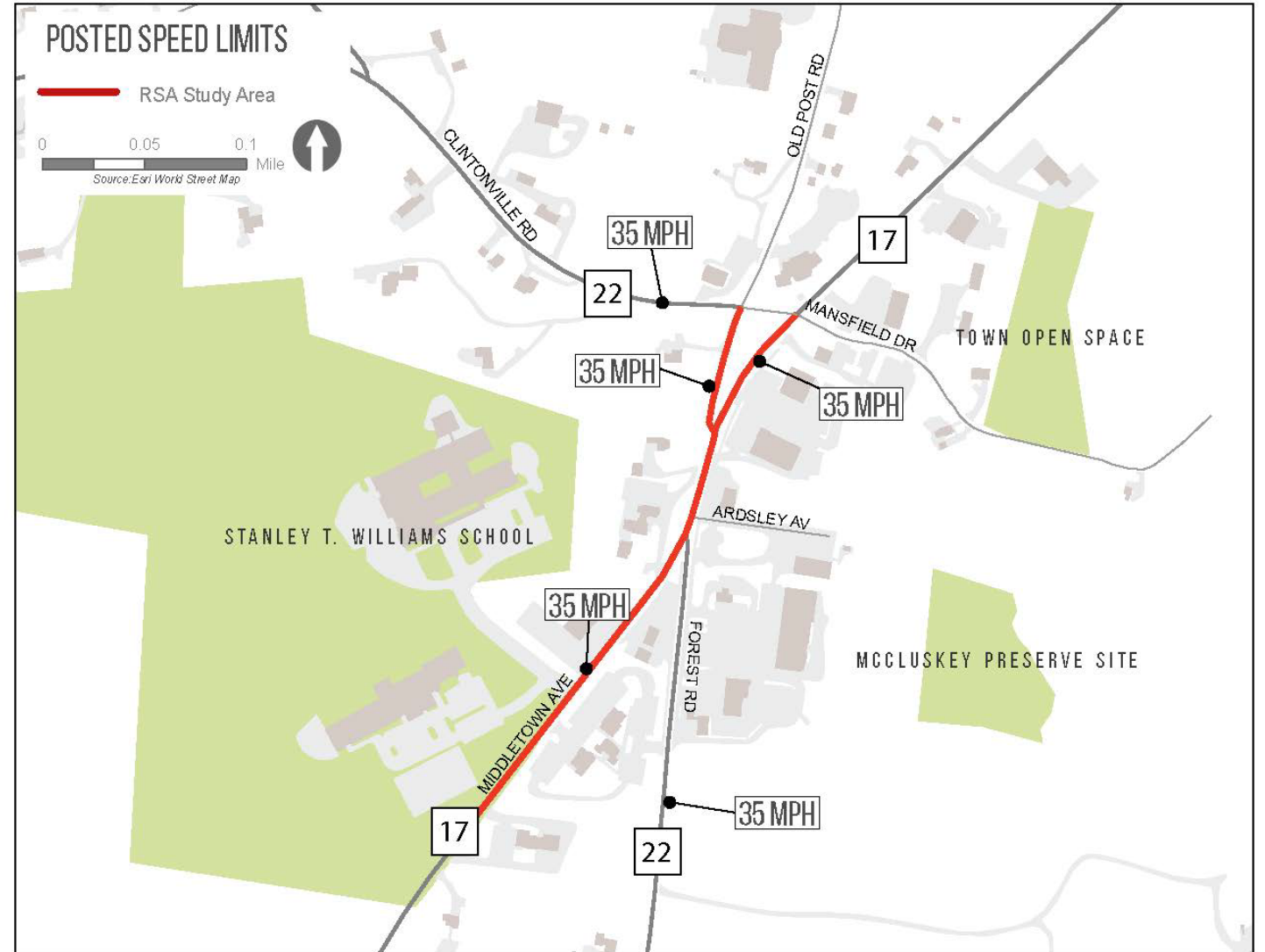
- Highest traffic volumes found on Route 22 south of Old Post Rd and Route 17 between Mansfield Dr and Ardsley Ave
  - On Route 22 Clintonville Rd, and Route 17 north of Mansfield Dr, volumes decrease towards residential areas
  - Lowest volumes found on local roads leading into Northford center





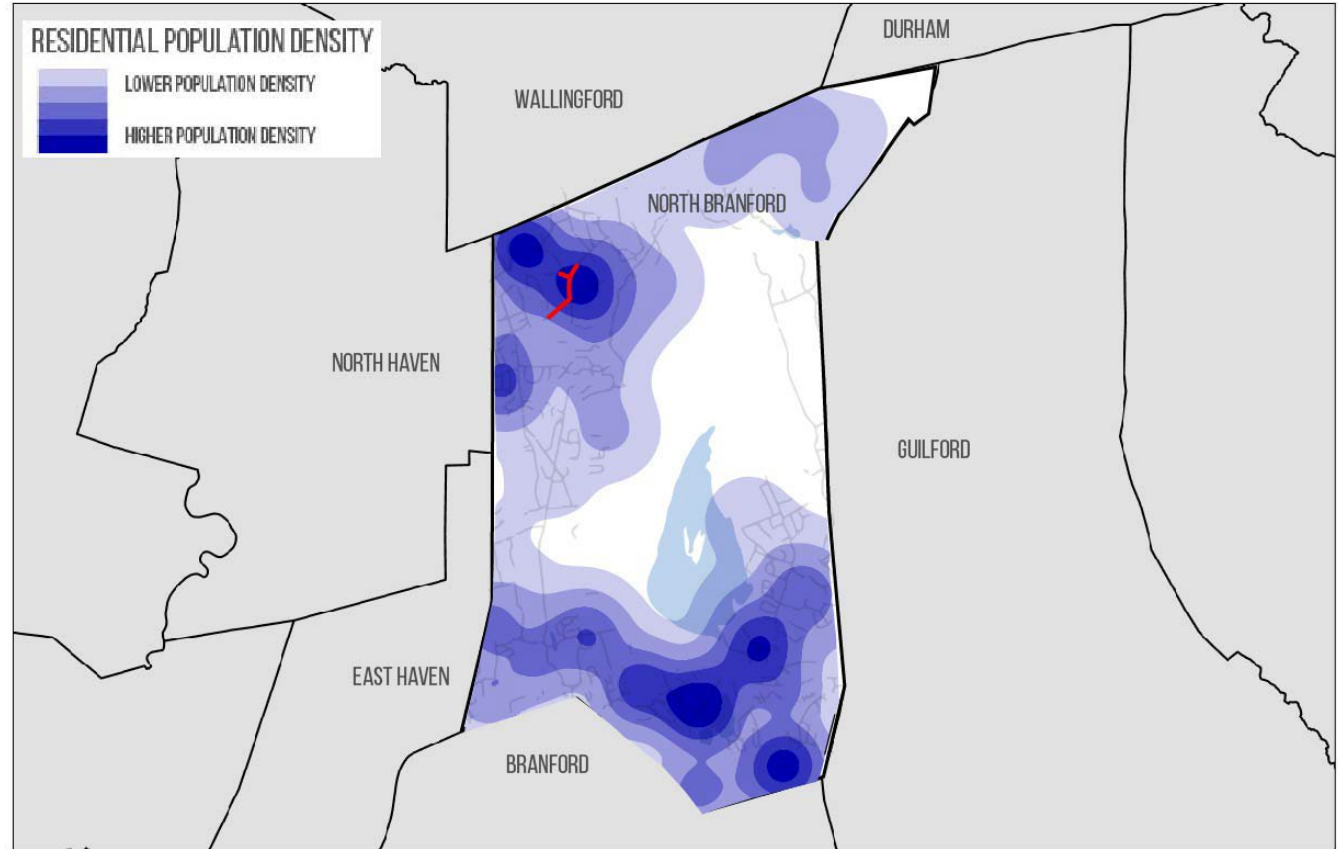
# TRAFFIC SPEED LIMITS

- Speed limits range from 35 MPH up to 45 MPH
- Route 17 is posted at 45 MPH through the corridor and Northford Center
- Route 22 is 35 MPH on Clintonville Road through Northford Center
- Route 22 posted at 40 MPH South of the Ardsley Ave intersection on Forest Road



# POPULATION DENSITY

- Population density is highest in the vicinity of the Study Area, many residential neighborhoods within walking distance to Northford Center
- Population density is lower along Route 22 South towards East Haven



# FUNCTIONAL CLASSIFICATION

- The roads in the study area are all arterial roads
- Route 17 is a Principal Arterial road and Route 22 is a Minor Arterial road
- Mansfield Drive and Old Post road are local roads



# ROADWAY GEOMETRY

## North Branford - RSA - Routes 17 & 22 Street Inventory

Road	From	To	Distance	Functional Classification	Speed Limit	Direction	Lanes	Lane Width	Sidewalk			ADA Ramps		Curb	Parking	Shoulder	On DOT Bike Network	Notes
									Type	Width	Condition	Present	Compliant					
Route 17 (Middletown Avenue)	North Branford Recreation Department	Route 17 (Forest Road)	570'	Principal Arterial	35	NB SB	1	12-18'	N/A	N/A	N/A	N/A	N/A	Paved	N/A	2-4'	Yes	NB lane widens in advance of intersection with Route 22
							1	12'	N/A	N/A	N/A	N/A	N/A	Paved	N/A	4'	Yes	
Routes 17 & 22 (Middletown Avenue)	Route 17 (Forest Road)	Mansfield Drive	720'	Principal Arterial	35	NB / WB SB / EB	1 + 1 1 + 1	10-11' 10'	Concrete N/A	3-5' N/A	Fair N/A	Yes N/A	No N/A	Paved Paved	N/A N/A	0-3' 0-12'	Yes Yes	SB / EB shoulder serving as bypass lane NB left turn lane, SB right turn lane
Route 22 EB (Old Post Road)	Clintonville Road	Route 17 (Middletown Avenue)	350'	Minor Arterial	35	EB	1	10-20'	N/A	N/A	N/A	N/A	N/A	Paved	No	0-3'	No	All EB traffic must turn right
Route 22 WB (Clintonville Road)	Route 17 (Middletown Avenue)	Old Post Road	160'	Minor Arterial	35	WB	1	>20'	N/A	N/A	N/A	N/A	N/A	Paved	N/A	2'	No	Steep uphill grade

\*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.

# CRASH ANALYSIS

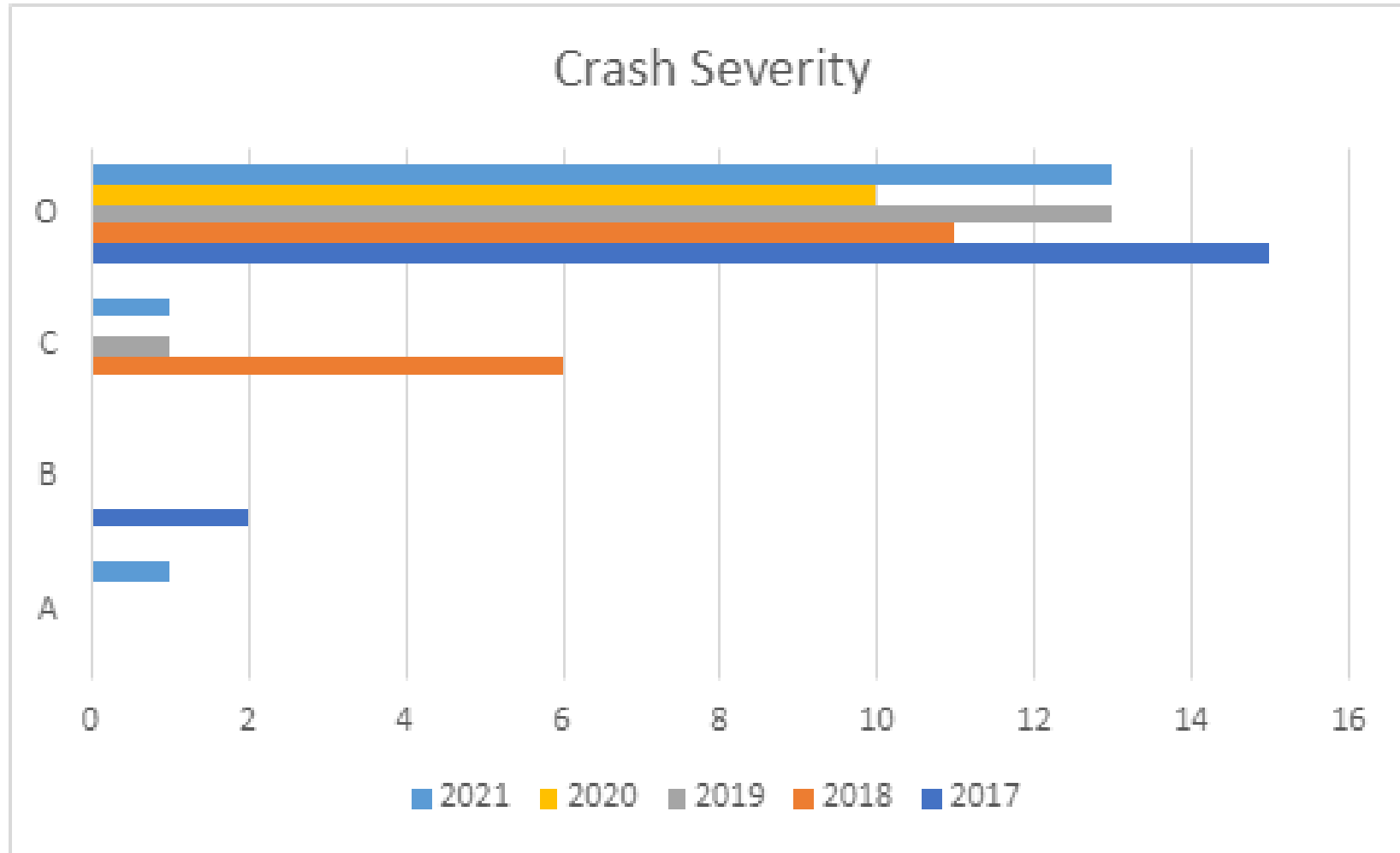
Crash Hotspots (5 Year Crash Total approx.)

73 Crashes Total

- Approximately 45 crashes in the vicinity of Route 17/Route 22 intersection
- Approximately 8 crashes on Route 17 near the library
- Approximately 8 crashes on Route 22 near Northford Congregational Church
- Approximately 10 crashes in the vicinity of Route 17 and Route 22 interchange near Ardsley Ave

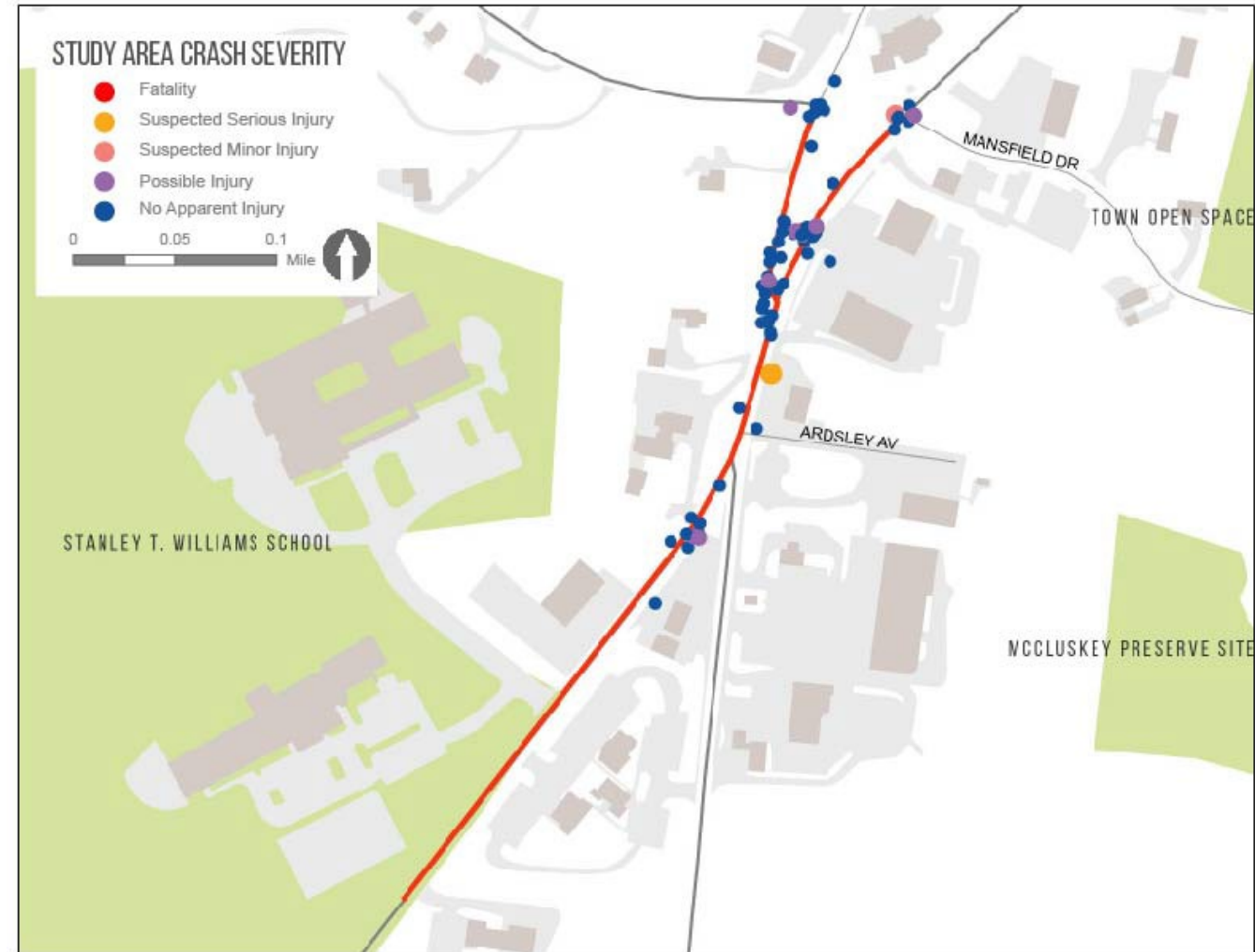


# CRASH TYPE



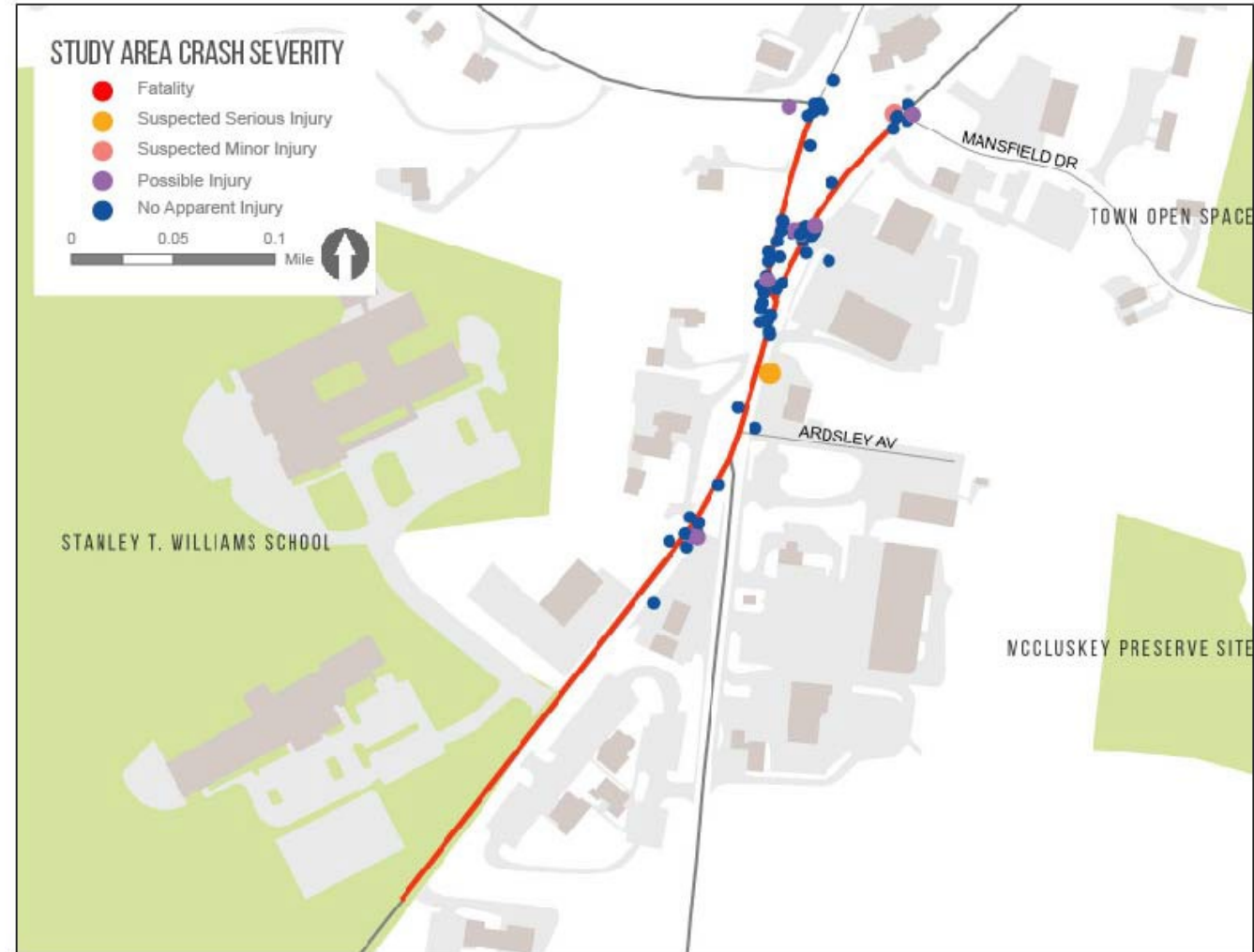
# CRASH TYPE

- Majority of crashes have no apparent injury



# CRASH SEVERITY

- Majority of crashes (62) are classified as No Apparent Injury- Property Damage Only
- There were 8 crashes resulting in a possible injury and 2 minor injury crashes
- No fatalities or serious injury crashes were reported in the past 5 years





# REVIEW OF PAST/CURRENT WORK

---

- SCRCOG Route 22 Study
  - Proposed redesign at the old post intersection
- 2019 Town of Branford Plan of Conservation and Development
  - One of the overarching planning goals: “Support a safe, Appropriate, and Connected Transportation Network for All Users”
  - “...there is a desire for targeted bicycle and pedestrian improvements.”



A photograph of a street intersection. In the foreground, a white SUV is driving across the intersection. To the right, a red octagonal stop sign stands on a grassy median. In the background, a Rite Aid pharmacy building is visible with several cars parked in front. The sky is overcast with grey clouds. A utility pole with power lines is also visible in the background.

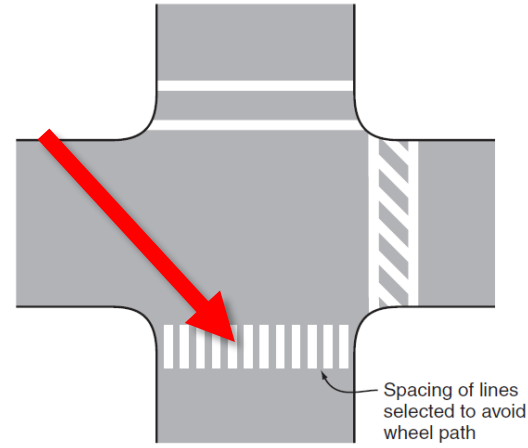
**SAMPLE IMPROVEMENTS TO IMPROVE  
SAFETY IN THE STUDY AREA**

# PEDESTRIAN COUNTER MEASURES



Sidewalks

Figure 3B-19. Examples of Crosswalk Markings



Crosswalks



RRFB



Pedestrian Refuge Islands



Raised Crosswalks



Sidepaths

# BICYCLIST COUNTER MEASURES



Sharrows



Bike Lanes



Buffered Bike Lanes



Sidepaths

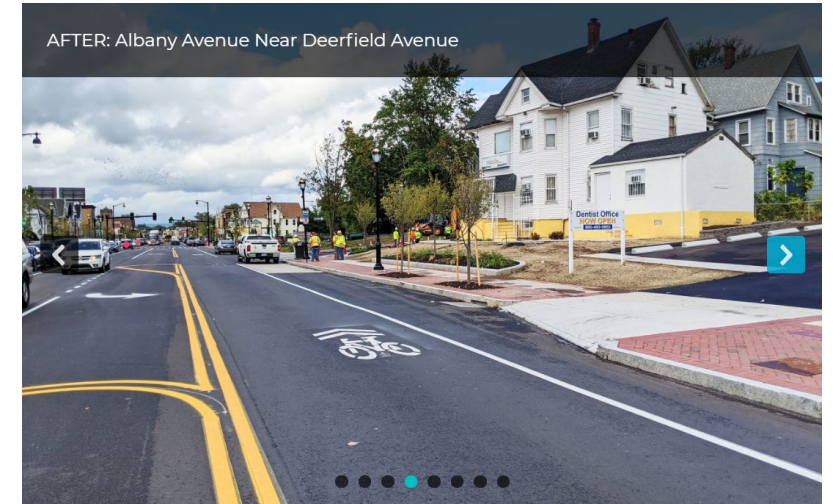
# SPEED REDUCTION — CROSS SECTION AND OTHER



Lane Narrowing



On Street Parking



Streetscape



Median Island



Street Trees



Dynamic Speed Signs

# SPEED REDUCTION — HORIZONTAL TREATMENTS

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Lateral Shift



**DISCUSSION ON  
ISSUES IN THE STUDY AREA AND  
OPPORTUNITIES**

# TOMORROW'S WALK AUDIT

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- Review safety protocols, reflective vests, etc.
- Meeting Location
- Walk the Study Area corridor and assess existing conditions and identify areas for improvement
- Post Audit discussion immediately following





THANK YOU!



## **North Branford Road Safety Audit**

**Meeting Location:** Virtual Meeting

**Date and Time:** June 20<sup>th</sup>, 2:00 PM – 3:00 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.



## **North Branford Road Safety Audit**

**Meeting Location:** North Branford Town Hall? Rec Department?

**Address:** Parking area 863 forest road corner of Ardsley Ave

**Date and Time:** June 21<sup>st</sup> 10:00 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.



## North Branford Audit Checklist

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

**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

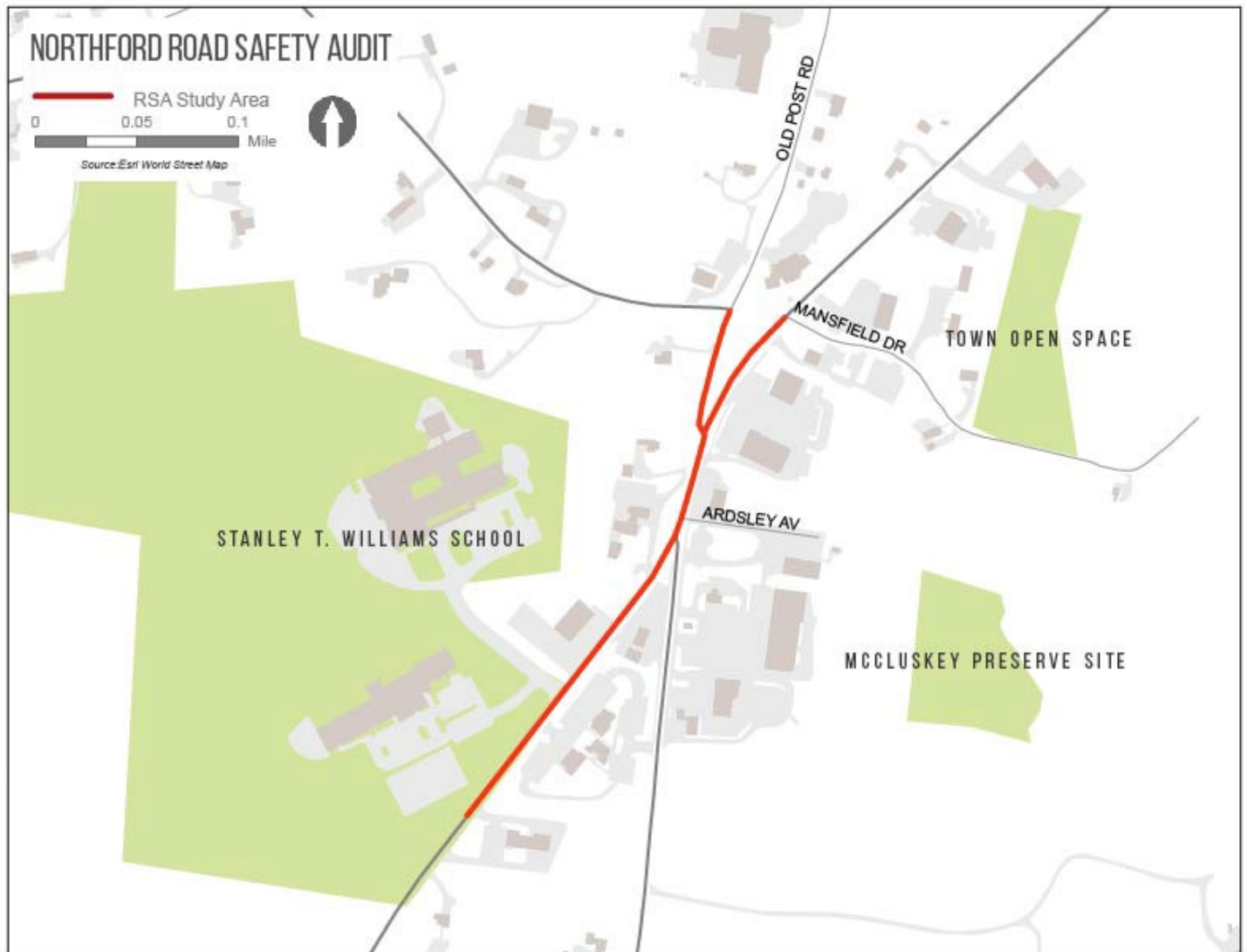
- Geometry
  - Road width (lanes, shoulders, medians);
  - Access points;
  - Drainage
  - Tapers and lane shifts
  - Roadside clear zone /slopes
  - Guide rails / protection systems

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

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

## North Branford Road Safety Audit - Study Area

- Route 17 between North Branford Recreation Department and Mansfield Drive
- Route 22 between Clintonville Road and Route 17
- Vicinity of Northford Center



## North Branford Road Safety Audit - Average Daily Traffic Volumes in 2019

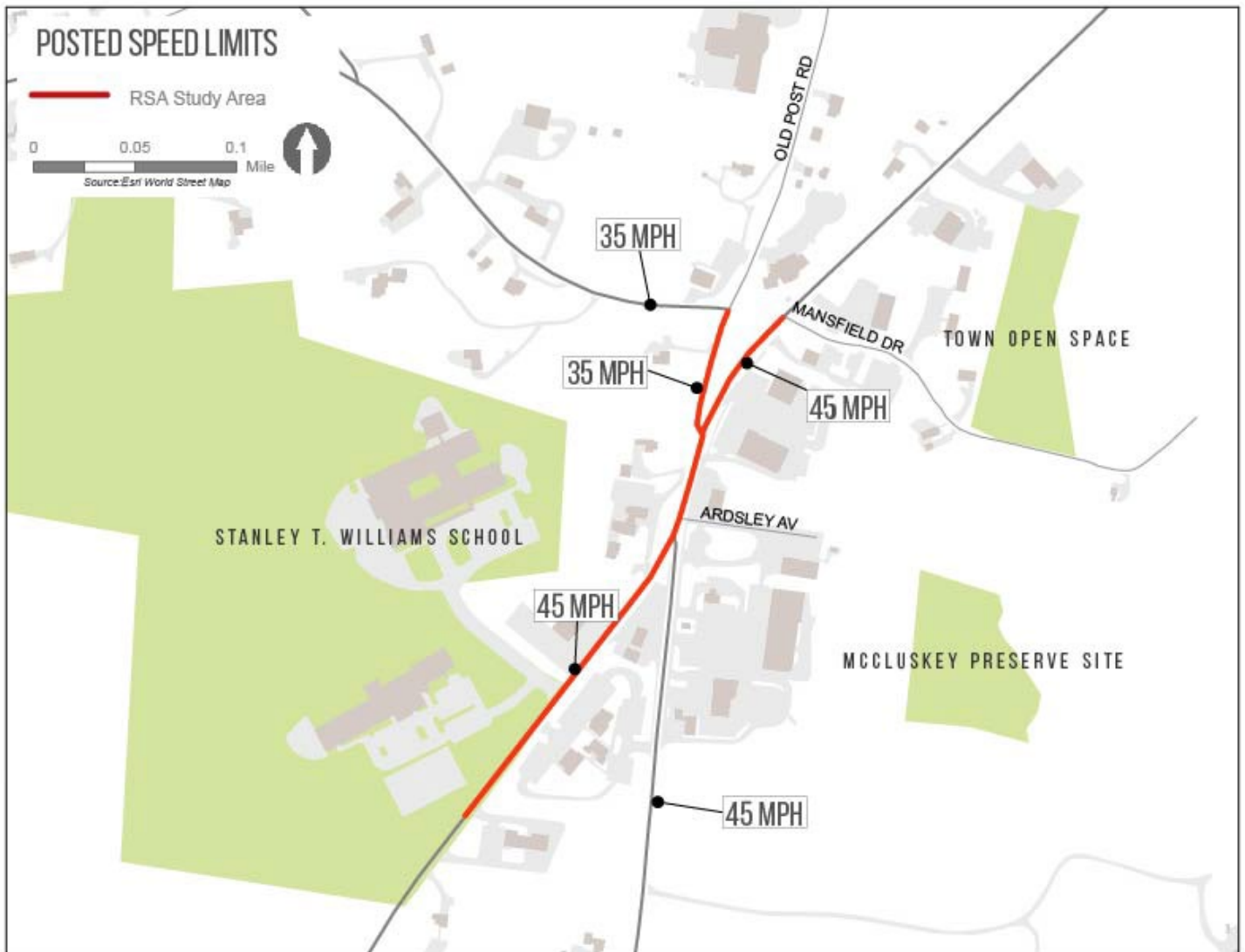
- Highest traffic volumes on Route 17 south of Mansfield Drive and Route 22 south of Clintonville Road and south of Ardsley Avenue
- On Route 17 and 22, north of the interchange, volumes decrease. Volume also decreases south of the interchange, towards the recreation department.
- Lowest volumes found on local roads





## North Branford Road Safety Audit – Posted Speed Limits

- Speed limits range from 35 MPH up to 45 MPH
- Route 22 is 35 MPH north of Ardsley Ave and Route 17 is 45 MPH through the corridor respectively
- The southern portion of Route 22 is 45 MPH



# North Branford Road Safety Audit - Crash Summary Heat Map



## North Branford Road Safety Audit - Crash Summary

Years: 2017 – 2021

	Crash Severity					TOTAL
	Fatality	Serious Injury	Minor Injury	Possible Injury	Property Damage Only	
Angle		1	2	4	18	25
Front to front						0
Front to rear				3	35	38
Sideswipe, opposite direction						0
Sideswipe, same direction					3	3
Rear to Side					1	1
Rear to Rear					1	1
Not Applicable				1	3	4
Other					1	1
<b>TOTAL</b>	0	1	2	8	62	73
Crashes Involving Pedestrians	0	0	0	0	0	0
Crashes Involving Bicyclists	0	0	0	0	0	0

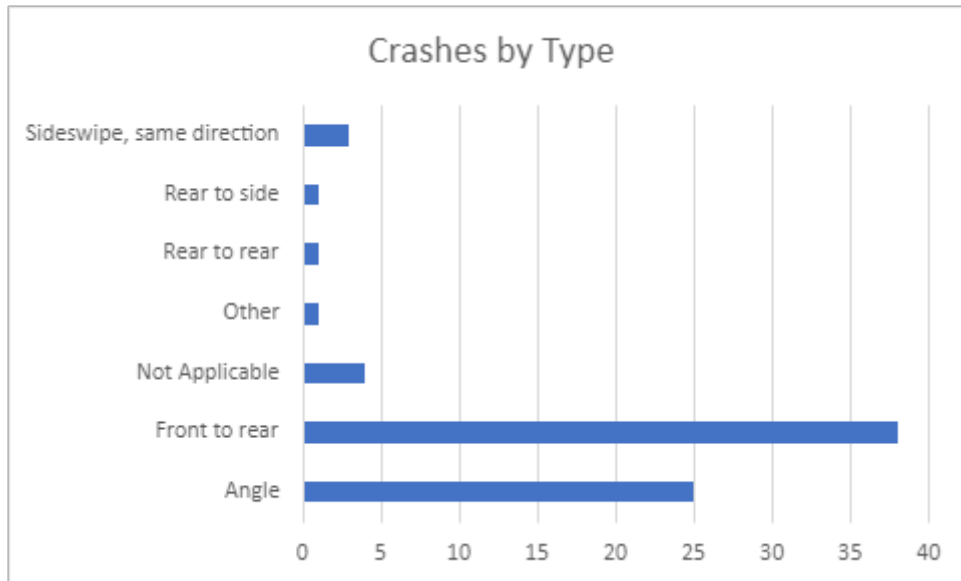
### Summary Analysis:

Crash Hotspots (5 Year Crash Total approx.) 73 Crashes Total

- Approximately 45 crashes in the vicinity of Route 17/Route 22 intersection north of Ardsley Ave
- Approximately 8 crashes on Route 17 near the library
- Approximately 7 crashes in the vicinity of Route 22 near Northford Congregational Church
- Approximately 10 crashes in the vicinity of Route 17 and Route 22 exchange south of Ardsley Ave

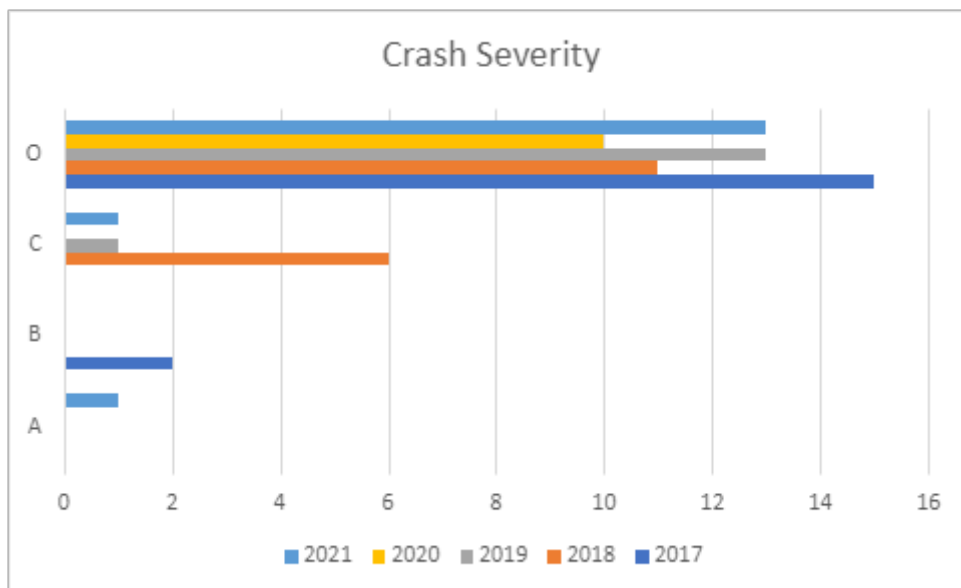
## North Branford Road Safety Audit Crash Summary - Crashes by Type

- Majority of crashes are front to rear and angle



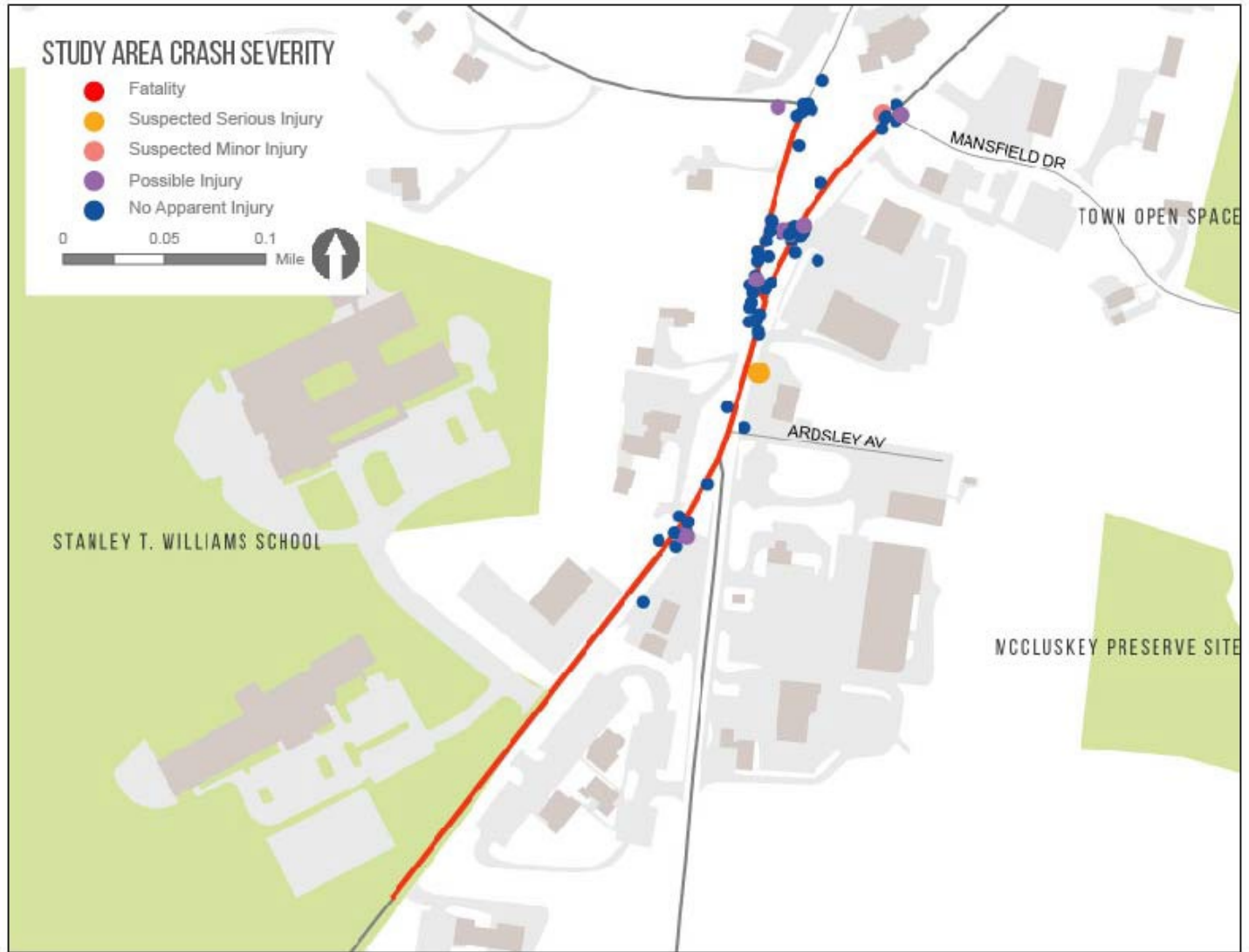
## North Branford Road Safety Audit Crash Summary - Crash Severity

- Majority of crashes (62) are classified as No Apparent Injury- Property Damage Only
- There were 8 crashes resulting in a possible injury and 2 minor injury crashes
- No fatalities or serious injury crashes were reported in the past 5 years



### STUDY AREA CRASH SEVERITY

- Fatality
- Suspected Serious Injury
- Suspected Minor Injury
- Possible Injury
- No Apparent Injury



## North Branford Road Safety Audit – Review of Past and Current Work

- SCRCOG Route 22 Study
  - Proposed redesign at the old post intersection
- 2019 Town of Branford Plan of Conservation and Development
  - One of the overarching planning goals: “Support a safe, Appropriate, and Connected Transportation Network for All Users”
  - “...there is a desire for targeted bicycle and pedestrian improvements.”
  - “The highest Average Daily Traffic Volumes (ADT) can be found at ... Route 17 in Northford Center ...”



*Source: Town of North Branford POCD 2019*

## **North Branford 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**

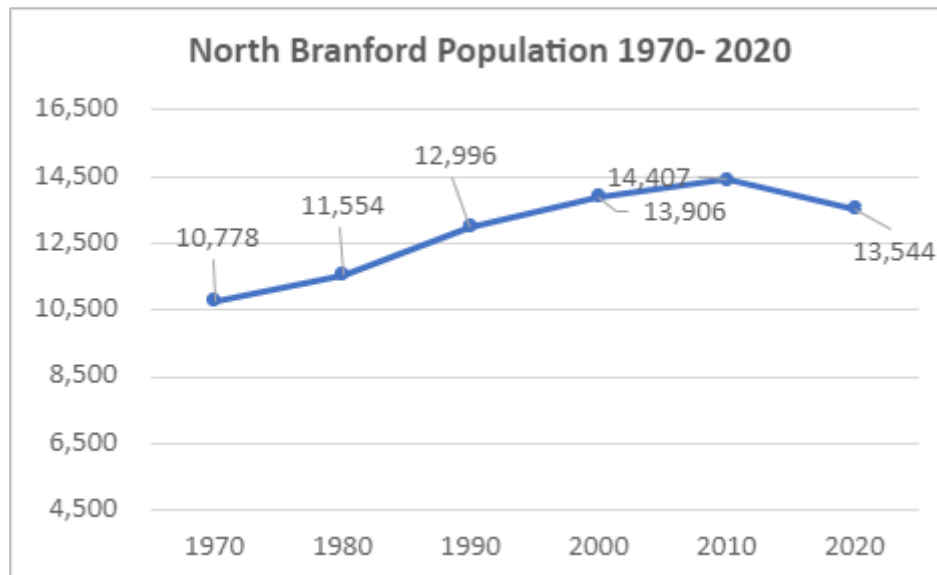
### **Next Steps**

- Discussion involving implementation strategies and responsibilities and funding sources

## North Branford Road Safety Audit – North Branford Fact Sheet

### Demographic Highlights<sup>1</sup>:

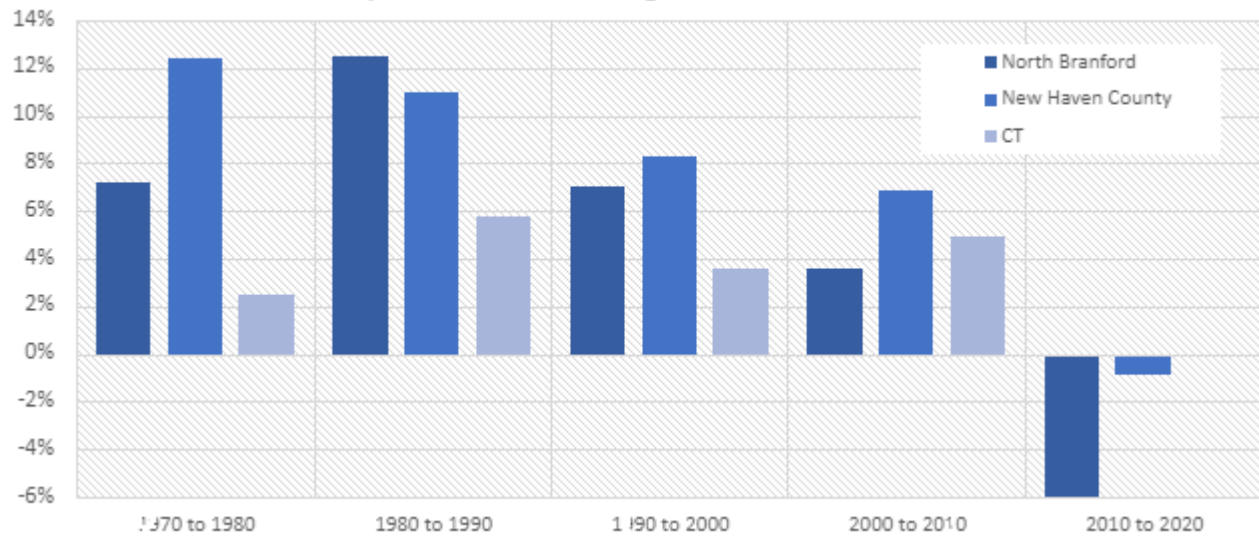
- Total population in North Branford is 13,464.
- Chester saw growth between 1970 and 2010. Chester, Middlesex County, and the State all declined in population between 2010 and 2020.
- There are approximately 223 residents per square mile in Chester, making it less densely developed than Middlesex County and much less dense than the State as a whole.
- The median age in Chester is 50. Middlesex County's median age is 46 and the State's is 41 years old.



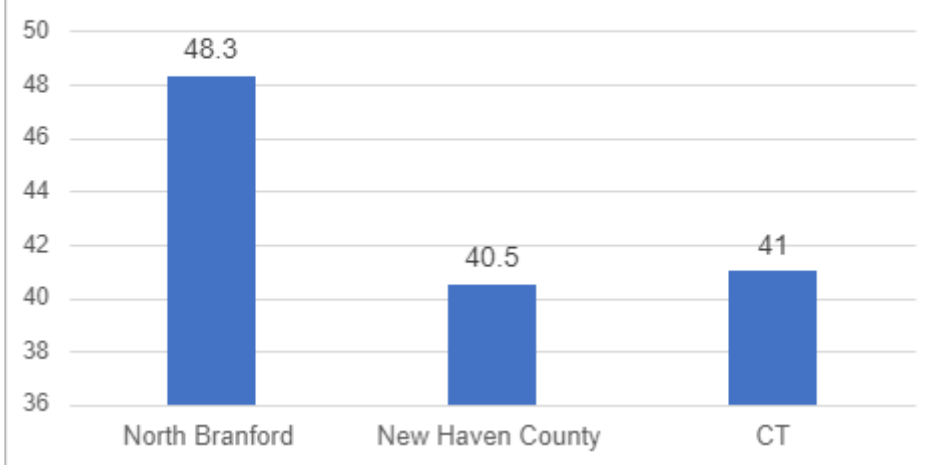
<sup>1</sup> 2020 Decennial Census and 2016- 2020 American Community Survey, 5- year estimate table DP05, Accessed on 06/16/2023 at <https://data.census.gov/cedsci/>

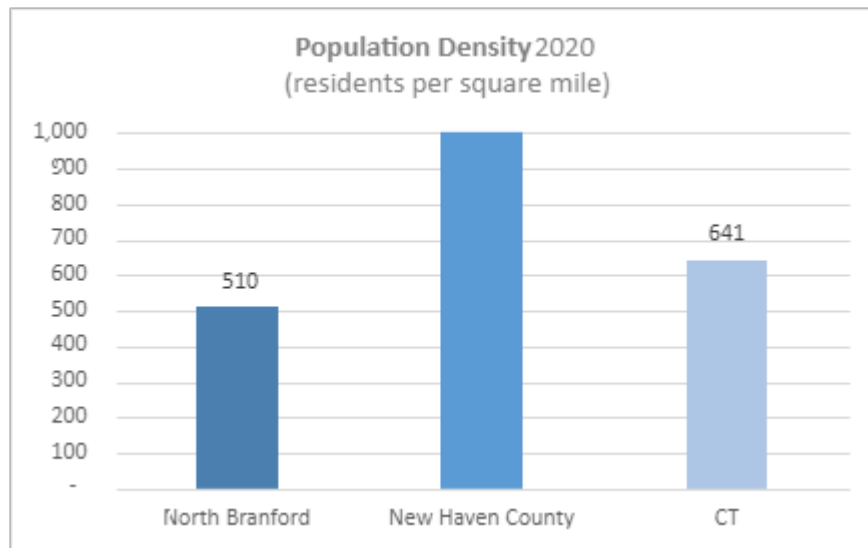


Population Growth vs Region



Median Age (2021)



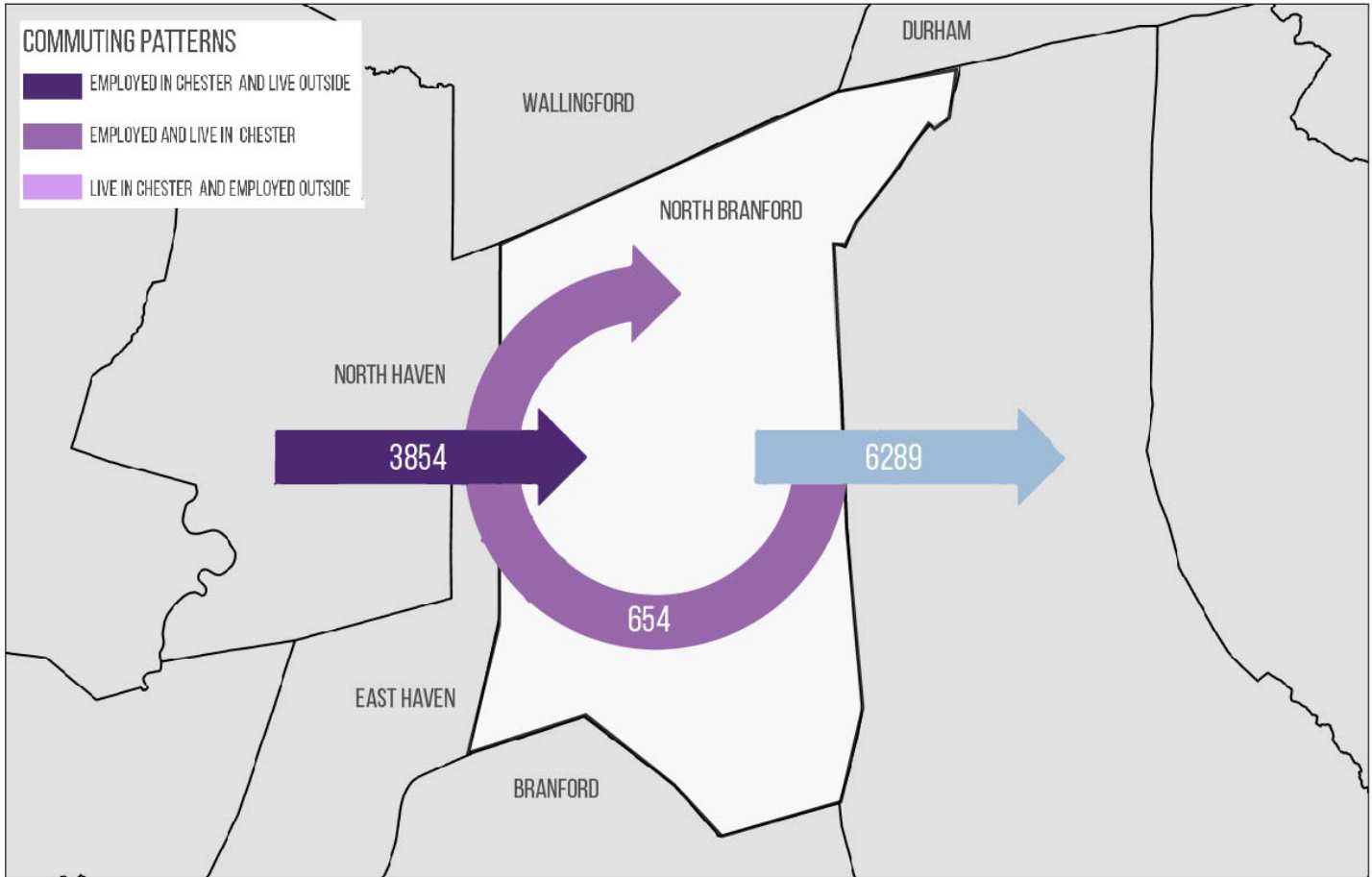


## North Branford Road Safety Audit – North Branford Fact Sheet

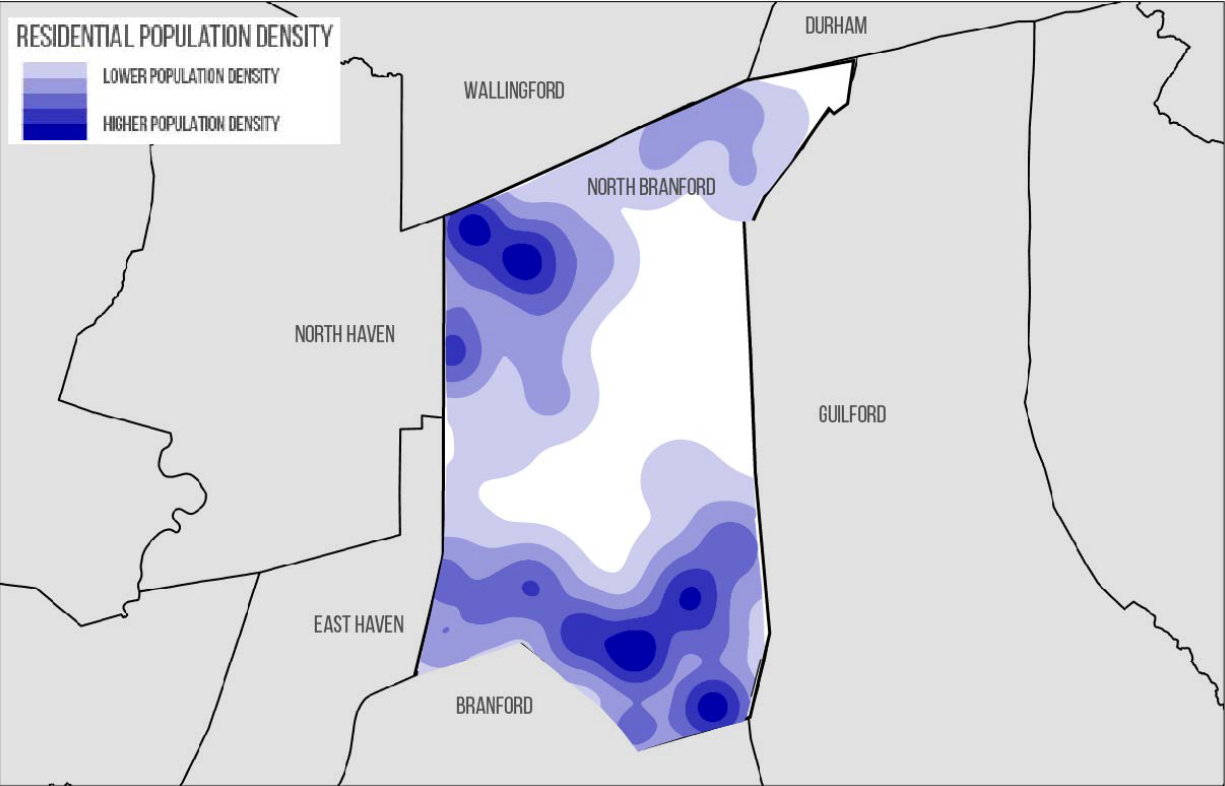
### Employment Highlights<sup>2</sup>:

- There were approximately 3,854 workers commuting into North Branford for employment in 2020. Approximately 654 residents of North Branford are also employed in North Branford and 6,289 North Branford residents commuted out of town for employment. (2019)
- The top five employment destinations for North Branford residents include:
  - New Haven
  - North Haven
  - West Haven
  - Meriden
  - East Haven
- The Study Area and surrounding neighborhoods have a medium to high population density. The Study Area is home to a variety of uses including residential neighborhoods, commercial and restaurant uses, the North Branford Recreational Department, and churches.

<sup>2</sup> U.S. Census Bureau. (2021). LEHD Origin-Destination Employment Statistics (2002-2019) All Jobs. Washington, DC: U.S. Census Bureau, Longitudinal-Employer Household Dynamics Program, accessed on June 16, 2023 at <https://onthemap.ces.census.gov>. LODS 7.5



# Residential Population Density



## North Branford Safety Audit – Roadway Functional Classification

- Route 22 is a Minor Arterial and Route 17 is a Principal Arterial
- Many other roadways that intersect the Study Area are local

