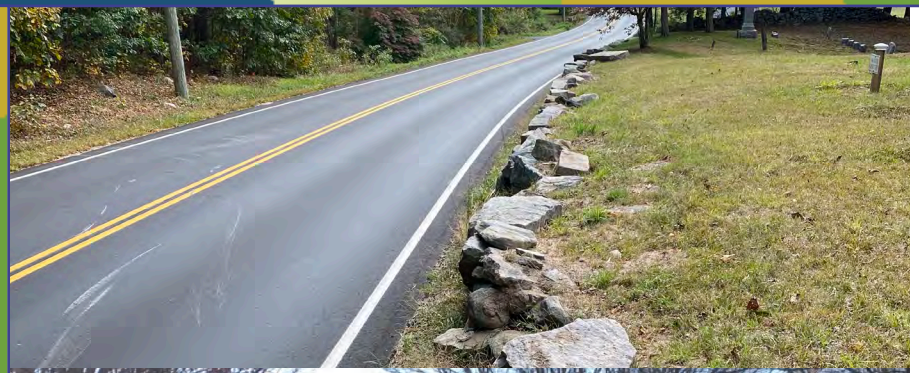
LOWER CONNECTICUT RIVER VALLEY REGIONAL TRANSPORTATION SAFETY PLAN



December, 2021 - Amended July, 2022

RiverCOG
Lower Connecticut River Valley Council of Governments

CONNECTICUT DEPARTMENT OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

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Report Terminology

TERM	DEFINITION
AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway Transportation Officials
ADT	Average Daily Traffic
Cat Tracks	Dotted lines that extend lane line markings into the intersection for enhanced delineation. They are typically applied at offset, skewed, multileg, complex intersections, or curved roadways, or where multiple turn lanes are used.
Collector Road	The Federal Highway Administration defines Collector Roads as the network that gathers traffic from local roads and directs them to the Arterial network.
FHWA	Federal Highway Administration
HSIP	Highway Safety Improvement Program
Injury A	Suspected Serious Injury
Injury B	Suspected Minor Injury
Injury C	Possible Injury
Injury K	Fatal Injury
Injury O	Property Damage Only
LPI	Leading pedestrian interval. A leading pedestrian interval (LPI) gives pedestrians the opportunity to enter an intersection 3-7 seconds before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left.
Local Roads	The FHWA describes Local Roads as having the largest percentage of all roadways in terms of mileage. They are intended for short distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. They are often designed to discourage through traffic.
LRTP	Long-Range Transportation Plan
MUTCD	Manual on Uniform Traffic Control Devices
MVMT	Million Vehicle Miles Traveled
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
Per VMT	Describes a crash rate per million vehicle miles
Per Capita	Describes a crash rate per population
Performance Measure	Indicators that enable decision-makers and other stakeholders to monitor changes in system conditions and performance against established visions, goals, and objectives.
RTSP	Regional Transportation Safety Plan
Reverse Curve	Reverse curves are two successive turns or curves that bend in opposite directions.
SHIP	State Highway Improvement Plan
SHSP	Strategic Highway Safety Plan
TIP	Transportation Improvement Program
VMT	Vehicle Miles Traveled

1. Introduction

Executive Summary

In 2017, the Connecticut Department of Transportation (CTDOT) published the Connecticut Strategic Highway Safety Plan (SHSP) to guide the State in reducing injuries and fatalities along Connecticut roadways. This Regional Transportation Safety Plan (RTSP) is in congruence with the Connecticut SHSP. It will serve as a road map and strategy to help the Lower Connecticut River Valley Region and its 17 municipalities collaborate with the State in reducing injury and fatal crashes. It will also serve to increase safety awareness and allow the member towns, cities, and the region to focus on their transportation safety issues.

The approach used in this study applies similar methodology to the State plan, but it includes more local input, reflecting both the needs of each of its 17 individual communities and the region as a whole. In addition to the regional plan, each municipality has its own mini report, which includes specific crash data and priority locations, while incorporating stakeholder feedback.

The plan is data-driven, multimodal, and multidisciplinary. It identifies the region's high-frequency crash locations and outlines effective countermeasures and strategies to reduce crashes. The purpose of listing countermeasures is to help the region prioritize its projects and better position the region for any available safety funds.

The plan was developed involving local stakeholders from the four E's of transportation safety: engineering, enforcement, education, and emergency response. The overall goal of the Lower Connecticut River Valley Region's RTSP is to reduce the number of traffic fatalities occurring in the region. RiverCOG has endorsed the targets for safety performance measures established by CTDOT since 2017 and will continue to review and conceivably endorse them in the future.

This RTSP is a living document. Federal regulations require an update for the SHSP every five years, and this regional safety plan will follow similar update methods. The regional plan will adhere to the same mandates, with the expectation that all updates will reflect the most current federal surface transportation legislation.

THE FOUR E'S OF TRANSPORTATION SAFETY

ENGINEERING: Highway design, traffic, maintenance, operations, and planning professionals.

ENFORCEMENT: State and local law enforcement agencies.

EDUCATION: Prevention specialists, communication professionals, educators, and citizen advocacy groups.

EMERGENCY RESPONSE: First responders, paramedics, fire, and rescue.

CT-81 at the intersection of High Street and Central Avenue, Clinton, CT. Source: VN Engineers.

2. Stakeholders

Stakeholders engaged in the process and development of the Lower Connecticut River Valley Region's RTSP include representatives from the four E's. In order to ensure stakeholder input, the Lower Connecticut River Valley Council of Governments (RiverCOG) member municipalities were involved with the plan development from the onset of the study. The following is a list of involved safety partners. Under each municipal report, there are additional stakeholders that participated in the plan.

RiverCOG Member Municipalities

Chester
Clinton
Cromwell
Deep River
Durham
East Haddam
East Hampton
Essex
Haddam
Killingworth
Lyme
Middlefield
Middletown
Old Lyme
Old Saybrook
Portland
Westbrook

CTDOT

State and Local Traffic Enforcement Officials

Municipal Fire Department officials and/ or First Responders

Municipal Officials

Municipal Public Works Directors

RiverMPO members

Samuel S. Gold
JH Torrance Downes
Robert Haramut
Janice Ehlemeyer
Paula Fernald
Margot Burns
Megan Jouflas
Eliza LoPresti
John McDonald
Kevin Armstrong
Ben Lovejoy

Estuary Transit District / Middletown Transit District

Joseph Comerford

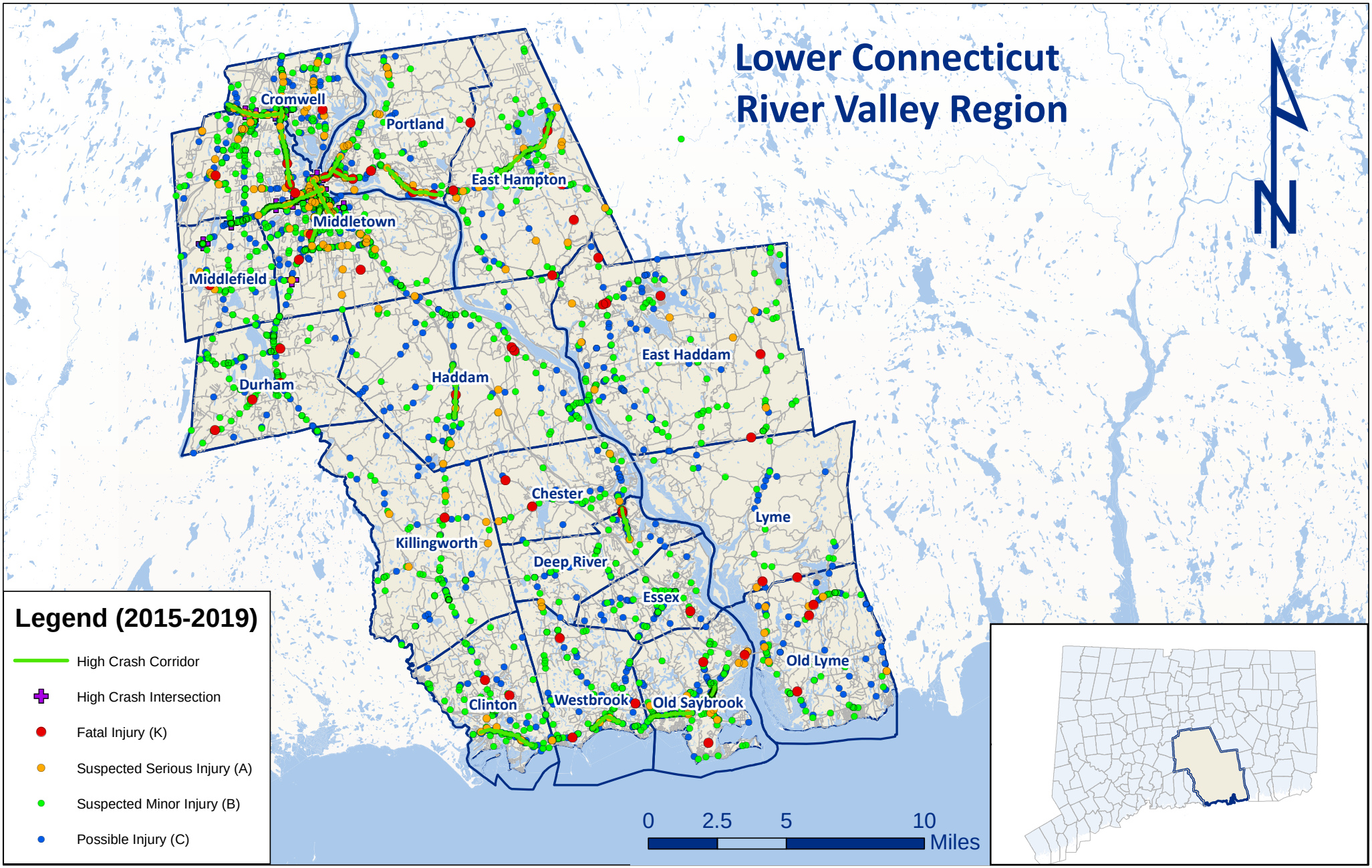
Middlesex County Chamber of Commerce

Darlene Briggs

RiverCOG

Member Town Representatives

Lauren Gister
Karl Kilduff
Anthony Salvatore
Angus L. McDonald, Jr.
Laura L. Francis
Irene Haines
David E. Cox
Norm Needleman
Robert McGarry
Nancy Gorski
Steven Mattson
Edward P. Bailey
Benjamin Florsheim
Timothy Griswold
Carl P. Fortuna, Jr.
Ryan Curley
John Hall


Lower Connecticut
River Valley Region
N
Cromwell
Portland
East Hampton
Middletown
Middlefield
Durham
Haddam
East Haddam
Chester
Lyme
Killingworth
Deep River
Essex
Old Lyme
Clinton
Westbrook
Old Saybrook
0
2.5
5
10
Miles
Legend (2015-2019)
High Crash Corridor
High Crash Intersection
Fatal Injury (K)
Suspected Serious Injury (A)
Suspected Minor Injury (B)
Possible Injury (C)

3. Regional Overview

The Lower Connecticut River Valley Region is comprised of 17-member municipalities that include Chester, Clinton, Cromwell, Deep River, Durham, East Haddam, East Hampton, Essex, Haddam, Killingworth, Lyme, Middlefield, Middletown, Old Lyme, Old Saybrook, Portland, and Westbrook. The Region encompasses roughly 443 square miles, with a population of about 173,153 people. The municipalities range from rural to exurban to suburban and urban communities, so each town and city has varying local traffic concerns and challenges. The predominant use of land in the Lower Connecticut River Valley Region is rural, where Middletown, Cromwell and Portland are the main urban land municipalities. Combined land-use and continuing development along regional arterials are increasing traffic volumes and challenging roadway capacity.[1]

In order to analyze and best understand the Region's transportation network, each municipality in the region was invited to participate in the development of this plan to improve the safety of transportation within their individual town or city. The objective was to identify each municipality's concerns and then piece these together to present an overall regional safety plan. The insights and cooperation of each municipality and RiverCOG staff were imperative to the success of this initiative.

The data gathered and used for this study represents crashes that occurred on both local and State roads. In many cases, numerous crashes occurred on State roads, most likely due to higher traffic volumes. All roads, except limited access highways, were included in the study. According to the State, each municipality is responsible for improvements on local roads, but local officials cannot make any physical changes or improvements to any State road without an encroachment permit from the State.

Lake Beseck Road, Middlefield, CT. Source: VN Engineers

1 Source: "Lower Connecticut River Valley Regional Transportation Plan (2019-2045)"

4. RTSP Planning Process

Beginning in 2017, federal regulation mandates that states set five performance targets each year:

1. **Number of Fatalities**
2. **Rate of Fatalities per 100 Million Vehicle Miles Traveled (VMT)**
3. **Number of Serious Injuries**
4. **Rate of Serious Injuries per 100 Million VMT**
5. **Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries (combined total)**

The crash statistics are evaluated on a five-year moving average. The Lower Connecticut River Valley Regional Transportation Safety Plan will also look at these same performance metrics and establish the region's target objectives in congruence with the State's plan. This includes a reduction in the number of fatalities and serious injuries on all public roads in the region. In order to obtain this goal, the RTSP includes estimated completion time (short, medium, and long), possible costs, and funding sources for all proposed countermeasures.

The Lower Connecticut River Valley Regional Transportation Safety Plan process is composed of a regional study and 17 municipal studies. The regional overview was a data-driven analysis of the top crash locations, which includes a listing of possible countermeasures, and the selection of emphasis areas and strategies to reduce injury and fatal crashes. The municipal studies includes data-driven crash locations and stakeholder input to reduce injury and fatal crashes in each municipality. Combining the data-driven analysis with stakeholder input provided for a more comprehensive regional transportation safety plan.

The municipal reports are in the appendices, but since they were completed prior to the regional analysis, their methodology is included first in this plan. More information on the regional analysis and methodology is found in section 5.

The methodology for the municipal reports began with the collection of injury and fatal crash data from the period of January 1, 2015 to December 31, 2019. The data was collected from the Connecticut Roadway Safety Management System website, specifically excluding limited-access highways. The crash data studied in this report consisted of only injury and fatal crashes after the removal of property damage only (PDO) crashes. PDO crashes were not included in this study because they were not included in the Connecticut SHSP.

The extracted crash data was imported into the mapping program, ArcGIS, to create 17 individual injury and fatal crash maps, one for each Lower Connecticut River Valley Region municipality. High-frequency crash locations were identified and if an intersection or segment of roadway had a cluster of crashes, it was highlighted on the maps. Additional crash locations were identified by municipal representatives due to potential safety concerns or due to historic site-specific safety issues not reflected in the five years of data analyzed. These were not added to the maps, but the locations were included in the municipal reports in the Town Input sections.

Crash locations and corresponding severities were presented at each of the municipal meetings with chief elected officials, EMS, law enforcement agents, public works directors, and other municipal stakeholders. These meetings were an opportunity to receive municipal input into the crash locations and to get feedback on contributing factors. The input from municipal representatives influenced the development of countermeasure recommendations for the municipal reports.

The municipal reports include the meeting summary in the Municipal input section. In addition, two field reviews were completed based on the priority locations of the municipal representatives . A summary of the field review and images taken are included in the Field Site Inventory section of the municipal reports. Countermeasure tables are also included at the end of each municipal report to suggest safety improvements that could be considered in each of the Region's member town or city.

The top motorized and non-motorized crash locations in the region were also identified and were further analyzed to identify contributing factors and possible countermeasures. For a more detailed description of this process, please see the Lower Connecticut River Valley Region's Top Crash Locations section of this report found on page 9.

5. Top Regional Crash Locations

5.1 Methodology for Identifying Top Crash Locations in the Region

Overview

This report identifies the top crash intersections and corridors in the region using the Equivalent Property Damage Only (EPDO) methodology built into the Connecticut Roadway Safety Management System. This method is based on the EPDO crash costs that were developed using Federal Highway Administration's (FHWA) national guidance. The EPDO method calculates a combined frequency and severity score for each site by assigning weighting factors to crashes by crash severity and monetary consequences. This score is then divided by the mile length and number of analysis years to develop an average annual EPDO score that allows for segments of varying lengths to be compared uniformly. The weighting factors are based on the costs of property damage only crashes, and the calculated score accounts for the severity of crashes and the expected crash costs for each site. The weighting factors used in this study are estimated by the FHWA and documented in the "Safety Analyst User Manual" based on the mean comprehensive monetary costs for each severity level. These weighting factors and monetary consequences were updated in March 2021 by the Connecticut Transportation Safety Research Center (CTSRC) for the Connecticut Department of Transportation (CTDOT).

The comprehensive monetary costs are as follows:

- **K** (fatal): $6,415,389
- **A** (suspected serious injury): $338,576
- **B** (suspected minor Injury): $123,646
- **C** (possible injury): $69,451
- **O** (no apparent injury): $11,186

The ratio of these combined direct and indirect crash-related costs provided the weights for each maximum severity associated with each crash.

CT-66 (Portland-Cobalt Road) Portland, CT. Source: VN Engineers

KABCO SEVERITY RANKINGS

Severity	Crash Cost	EPDO Score
K-Fatal	$6,415,389	574
A-Suspected Serious Injury	$338,576	30
B-Suspected Minor Injury	$123,646	11
C-Possible Injury	$69,451	6
O-Property Damage Only	$11,186	1

Final cuts were made to the ranked list of sites based on these criteria: ramps and interstates were removed and top ranked corridors and intersections were inspected visually to determine if there were overlapping sites. If intersections overlapped with a corridor(s), then the analyst determined if the high crash location was the result of the single intersection issue or the corridor as a whole. The top crash locations are divided into intersections (Table 5.2) and corridors (Table 5.3) and ranked based on EPDO.

Note: The final EPDO score should not be used as an objective standard. This observed crash-based analysis is subject to regression-to-the-mean[1] and should only be used as a relative metric for sites during the specific analysis period.

Similar to the methodology to select the top crash sites, EPDO score was used to rank those crashes solely involving vehicles and/or pedestrians and bicyclists. These were called non-motorized crash locations. The ranking of these crashes is based solely on the fatalities and injuries suffered by the non-motorists from these crashes, with more weight placed on injuries of greater severity. The non-motorized crashes exclude all single motorized vehicle or multi-vehicle collision. They are found on page 17. The non-motorized crash countermeasures were selected based on the Connecticut Uniform Police Crash Reports and a desktop review of the applicable locations.

1Regression-to-the-mean
When identifying potential safety issues, the analyst must be aware of the statistical phenomenon of regression-to-the-mean (RTM). RTM describes a situation in which crash rates are artificially high during the before period and would have been reduced even without an improvement to the site. Programs focused on high-hazard locations, such as the HSIP, are vulnerable to the RTM bias which is perhaps the most important cause of erroneous conclusions in highway-related evaluations. This threat is greatest when sites are chosen because of their extreme value (e.g., high number of crashes or crash rate) in a given time period.

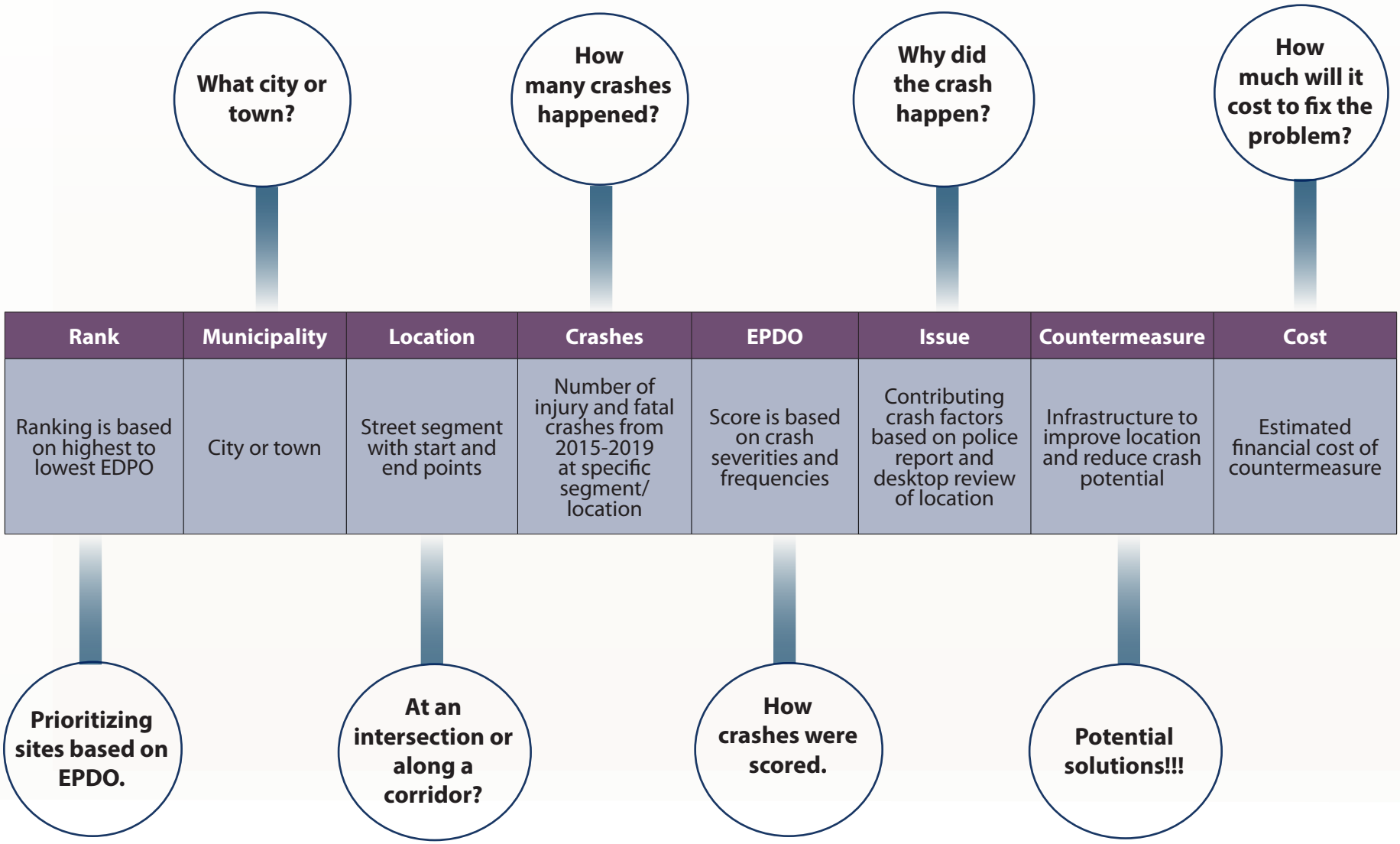
2015-2019
TOTAL CRASH AND INJURIES AND FATAL BY MUNICIPALITY

Municipality	Bike and Pedestrian Injury and Fatal Crashes	Motorized Injury and Fatal Crashes
Chester	3	51
Clinton	8	131
Cromwell	34	346
Deep River	4	59
Durham	5	140
East Haddam	2	158
East Hampton	9	205
Essex	3	73
Haddam	3	170
Killingworth	1	106
Lyme	0	29
Middlefield	5	98
Middletown	97	986
Old Lyme	7	97
Old Saybrook	26	174
Portland	5	205
Westbrook	10	133
Total	**222**	**3,161**

Top Crash Corridors and Intersections with Countermeasures

The following tables in 5.2 and 5.3 list the top crash corridors and intersections in the Lower Connecticut River Valley Region. These corridors and intersections have the highest EPDO crash ratings or were selected by the municipalities. The locations include a description of the affiliated issues and potential countermeasures for each location.

Below is an explanation of each column.



Rank	Municipality	Location	Crashes	EPDO	Issue	Countermeasure	Cost
Ranking is based on highest to lowest EDPO	City or town	Street segment with start and end points	Number of injury and fatal crashes from 2015-2019 at specific segment/ location	Score is based on crash severities and frequencies	Contributing crash factors based on police report and desktop review of location	Infrastructure to improve location and reduce crash potential	Estimated financial cost of countermeasure

5.2 Top Motorized Crash Locations with Countermeasures in the RiverCOG Region, 2015-2019

Top Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	CRASHES	EPDO	ISSUE	COUNTERMEASURE	COST
Middletown	CT-3 (Newfield St) between Rose Cir and Westfield St	3	1,152	Front-to-rear crashes	Install traffic signal retroreflective backplates at all signals	Low-Medium
					Install advanced intersection warning signs and beacons	Low-Medium
Clinton	CT-81 (Killingworth Tpke) between Hurd Bridge Rd and Oakwood Ln	3	1,100	Curve crashes	Increase curve delineation	Low
					Install high friction surface treatment	Low
Portland	CT-17/CT-66 (Marlborough St) between CT-17A (Main St) and Perry Ave	8	631	Front-to-rear crashes	Install traffic signal retroreflective backplates at all signals	Low-Medium
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Middlefield	CT-147 (Baileyville Rd) between Lakeview Pl and Powder Hill Rd	4	618	Curve crashes	Install high friction surface treatment	Low
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Middletown	CT-17 (S Main St) between Pinewood Ter and Ward St	4	395	Crashes related to drive-way access	Install turning lanes and/or limit the number of driveways	Medium-High
				Skewed intersection at Highland Ave	Convert to all-way stop or signalize intersection	Low-High
Portland	CT-17/CT-66 (Marlborough St) between High St and Grove St	7	379	Front-to-rear crashes	Install traffic signal retroreflective backplates at all signals	Low-Medium
				Speeding	Implement optical speed bars	Low
Middletown	CT-9/CT-17 (Chester Bowles Hwy) between CT-17 (St Johns Sq) and CT-545 (Washington St)	12	374	Front-to-rear crashes	Install traffic signal retroreflective backplates at all signals	Low-Medium
				Speeding	Implement optical speed bars	Low
Portland	CT-17/CT-66 (Portland-Cobalt Rd) between Grandview Ter and Sand Hill Rd	4	362	Median crashes at Sand Hill Rd	Increase visibility of attenuator and move Keep Right sign	Low-Medium
					Install longitudinal rumble strips	Low
				Speeding	Implement optical speed bars	Low

Top Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	CRASHES	EPDO	ISSUE	COUNTERMEASURE	COST
Middletown	CT-3 (Newfield St) between La Rosa Ln and Congdon St E	9	292	Front-to-rear crashes	Install traffic signal retroreflective backplates at all approaches of the CT-3 (Newfield St) intersection with La Rosa Ln	Low-Medium
				Crashes related to drive-way access	Install turning lanes and/or limit the number of driveways	Medium-High
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Chester	CT-154 (Middlesex Ave) between Gilbert Hill Rd and Winter Ave	3	279	Speeding	Install dynamic speed feedback signs at turns	Low
					Implement optical speed bars at turns	Low
Westbrook	CT-166 (Spencer Plains Rd) between Cold Spring Dr and BJM Pumps (East Entrance in Old Saybrook)	3	250	Speeding	Install dynamic speed feedback signs in advance of down slope	Low
					Implement optical speed bars	Low
				Curve crashes	Install high friction surface treatment	Low
East Hampton	CT-16 (Colchester Ave) between Harlan Pl and Tartia Rd	7	249	Speeding	Install dynamic speed feedback signs in advance of down slope	Low
					Implement optical speed bars	Low
				Curve crashes	Install high friction surface treatment	Low
Middletown	CT-17/CT-66 (Main St) between overpass above N Main St and Ramps to Lower Main St (in Port-land)	13	207	Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
				Curve crashes	Install high friction surface treatment	Low
Cromwell	CT-3 (Shunpike Rd) be-tween Stop & Shop South Entrance and 99 Restau-rant Entrance	7	203	Angle crashes	Restrict access to right-in, right-out to driveways in segment	Low
Durham	CT-79 (Madison Rd) be-tween S End Ave and Sand Hill Rd/Old Blue Hills Rd	3	202	Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Haddam	CT-81 (Killingworth Rd) between Hubbard Rd/ Pokorny Rd and Soobitsky Rd	5	199	Curve crashes	Install high friction surface treatment	Low
					Increase curve delineation	Low
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low

Top Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	CRASHES	EPDO	ISSUE	COUNTERMEASURE	COST
Middletown	CT-66 (Washington St) between Computer Tune & Lube Entrance and Mc-Donald's Entrance	14	183	Access management	Consolidate driveways to limit the number of conflict points and/or limit left turns	High
					Install turning lanes	High
Killingworth	CT-81 (Higganum Rd) between CT-148 (Chester Rd/Tooley Rd) and L Hommedieu Rd	4	166	Front-to-front crashes	Install center line rumble strips	Low
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Portland	CT-66 (Portland-Cobalt Rd) between Payne Blvd/Middle Haddam Rd and Grist Mill Ln/Oakum Dock Rd	25	161	Access management	Install turning lanes	High
				Lane departure crashes	Install high friction surface treatment	Low
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Middletown	CT-66 (Washington St) between CT-157 (West St)/ Bernie O'Rourke Dr and Sunoco gas station	20	155	Speeding	Install dynamic speed feedback signs	Low
				Access management	Consolidate driveways to limit the number of conflict points and/or limit left turns	High
					Install turning lanes	High
Durham	CT-17 (New Haven Rd) between Stage Coach Rd (West Entrance) and Coe Rd	4	142	Lane departure crashes	Install high friction surface treatment	Low
					Increase curve delineation	Low
				Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Chester	CT-148 (W Main St) and CT-145 (Winthrop Rd)	5	122	Northbound vehicles failing to stop	Install flashing warning beacons and/or doubling up stop signs	Low
Middletown	CT-66 (Washington St) between Boston Rd and CT-157 (West St)/Bernie O'Rourke Dr	11	120	Front-to-rear crashes	Install traffic signal retroreflective backplates at signals	Low-Medium
				Speeding	Install dynamic speed feedback signs	Low
				Access management	Consolidate driveways to limit the number of conflict points and/or limit left turns	High
Old Saybrook	CT-154 (Middlesex Tpke) and Bokum Rd	6	120	Skew angle	Reconfigure intersection or install roundabout	High
East Hampton	CT-66 (W High St/Portland-Cobalt Rd) and CT-151 (Middle Haddam Rd)/ Depot Hill Rd	5	120	Front-to-rear crashes	Install traffic signal retroreflective backplates at signal	Low-Medium
				Angle crashes	Delineate turning paths with pavement markings	Low

Top Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	CRASHES	EPDO	ISSUE	COUNTERMEASURE	COST
East Haddam	CT-434 (Hopyard Rd) between Devil's Hopyard State Park Entrance and Jones Hill Rd/Mitchell Rd	3	120	Curve crashes	Increase curve delineation	Low
Old Saybrook	US-1 (Boston Post Rd) between Burger King Entrance and Stage Rd/ River St	12	118	Front-to-rear crashes	Install traffic signal retroreflective backplates at signal	Low-Medium
				Speeding	Install dynamic speed feedback signs	Low
				Access management	Consolidate driveways to limit the number of conflict points and/or limit left turns	High
					Install turning lanes	High
Portland	CT-17/CT-66 (Main Street) between Ramps to Lower Main St and CT-17/CT-66 (Marlborough St)	9	105	Speeding	Install dynamic speed feedback signs	Low
				Front-to-rear crashes	Install traffic signal retroreflective backplates at signals	Low-Medium
				Access management	Consolidate driveways to limit the number of conflict points and/or limit left turns	High
Middletown	CT-66 (Washington St) between Sunoco gas station and Butternut St	14	99	Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Middletown	Main St between CT-66 (Washington St) and Court St	8	97	Angled parking conflict	Consider conversion to reverse angled parking and provide dedicated bike lane	Low-Medium
				Front-to-rear crashes	Install traffic signal retroreflective backplates at signals	Low-Medium
Cromwell	CT-3 (Shunpike Rd) between CT-524 (Berlin Rd) and Stop & Shop South Entrance	9	87	Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
				Access management	Consolidate driveways to limit the number of conflict points	High
					Install turning lanes	High
Cromwell	CT-99 (Main St) between Reiman Dr and Evergreen Rd	4	83	Speeding	Install dynamic speed feedback signs	Low
					Implement optical speed bars	Low
Old Saybrook	US-1 (Boston Post Rd) between CT-166 (Spencer Plains Rd) and Denmore Ln	6	81	Access management	Install turn lanes at the Citgo gas station	High

Top Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	CRASHES	EPDO	ISSUE	COUNTERMEASURE	COST
Middletown	CT-17/CT-66 (Main St) between N Main St and Overpass above N Main St	5	80	Speed on curve	Install transverse rumble strips	Low
					Install high friction surface treatment	Low
Middletown	CT-9 (Chester Bowles Hwy) and CT-17 (St Johns Sq)	39	71	Front-to-rear crashes and red light running	Install traffic signal retroreflective backplates at signal	Low-Medium
Cromwell	CT-372 (Berlin Rd) between Kirby Rd and Industrial Park Rd/I-91 Southbound Ramps	5	70	Access management	Install center line bollards for entire segment to force all driveways as right-in, right-out operation	Low
Middletown	Saybrook Rd between Dejohn Dr and Windy Hill Dr	3	70	Speeding	Install dynamic speed feedback signs	Low
Cromwell	CT-372 (Berlin Rd) between I-91 Northbound Ramps and Coles Rd	16	66	Front-to-rear crashes	Install traffic signal retroreflective backplates at signals	Low-Medium
				Access management	Tie access to Sunoco gas station with traffic signal; limit eastern driveway to right-out, with no entry	High
					Install plastic center line bollards on CT-372 (Berlin Rd) at eastern access to Lowe's	Low
Cromwell	CT-3 (Shunpike Rd) between 99 Restaurant Entrance and CT-372 (West St)	4	62	Angle crashes	Consider changing signal from protected/ permitted to protected left	Low
				Front-to-rear crashes	Install traffic signal retroreflective backplates at signal	Low-Medium
Middletown	CT-66 (Main St) between Rapallo Ave and CT-66 (Washington St)	6	53	Angled parking conflict	Consider conversion to reverse angle parking and provide curbed bike lane	Low-Medium

5.3 Top Non-Motorized Crash Locations with Countermeasures in the RiverCOG Region, 2015-2019

Top Non-Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	EPDO	PERSON TYPE	CRASH DETAILS	INFRASTRUCTURE COUNTERMEASURES	NON-INFRASTRUCTURE COUNTERMEASURES
Middletown	Church St between Pine St/Foss Hill Dr and High St	37	3 Pedestrians	One pedestrian struck in marked crosswalk at Allbritton Center during wet, daytime conditions. Two pedestrians struck at crosswalk in dark-lighted conditions.	Upgrade to high visibility crosswalk at Allbritton Center with rectangular rapid flashing beacon	Watch for Me CT Pedestrian Priority Zones Local Road Safety Plan
Middletown	Main St between CT-66 (Washington St) and Court St	37	3 Pedestrians, 1 Bicyclist	Three pedestrians struck crossing midblock (two during daylight, one during dark and wet conditions). Bicyclist struck by vehicle backing out of angle parking.	Consider conversion to reverse angle parking and provide dedicated bike lane	Watch for Me CT Bike and Pedestrian Safety Share the Road Campaign Bike Walk CT
Middletown	CT-66 (Main St) between Rapallo Ave and CT-66 (Washington St)	27	1 Pedestrian, 2 Bicyclists	Bicyclist struck at It's Only Natural driveway by turning vehicle. Other bicyclist involved in a crash, but not injured. Pedestrian struck crossing CT-66 (Main St) outside of the crosswalks.	Maintain marked crosswalks at intersections and driveways	Watch for Me CT Share the Road Campaign
Old Saybrook	US-1 (Boston Post Rd) between Starbucks Entrance and Stage Rd/River St	23	2 Bicyclists	One bicyclist struck by right-turning vehicle from CT-154 (Main St) onto US-1 (Boston Post Rd) at Mattress Firm.	Install marked crossing on east leg of intersection across CT-154 (Main St) and connect sidewalks	Watch for Me CT Bike and Pedestrian Safety Share the Road Campaign Bike Walk CT
Old Saybrook	US-1 (Boston Post Rd) between Baum Ave and School House Rd	17	2 Bicyclists	One bicyclist struck by vehicle turning into Dairy Queen parking lot. One bicyclist struck by vehicle exiting Tequila's restaurant parking lot.	Mark bicycle crossings across driveways	Watch for Me CT
Middletown	CT-66 (Main St) and CT-66 (Washington St)	13	5 Pedestrians	Two pedestrians struck while crossing intersection diagonally (one at night). Two pedestrians struck by turning vehicles. Another pedestrian struck in dark conditions.	Provide leading pedestrian interval Maintain high visibility crosswalks on all legs of intersection	Watch for Me CT Bike and Pedestrian Safety Bike Walk CT

Top Non-Motorized Crash Locations with Countermeasures, 2015-2019

MUNICIPALITY	LOCATION	EPDO	PERSON TYPE	CRASH DETAILS	INFRASTRUCTURE COUNTERMEASURES	NON-INFRASTRUCTURE COUNTERMEASURES
Clinton	US-1 (E Main St) between Beach Park Rd/Plymouth Ct and Mallard Ln/Meadow Rd	10	1 Pedestrian, 1 Bicyclist	Pedestrian struck by exiting vehicle at Auto Zone driveway. Bicyclist on US-1 (E Main St) struck by exiting vehicle from Shop Rite driveway.	Install marked crosswalks for all driveways and intersections	Watch for Me CT Bike and Pedestrian Safety Bike Walk CT
Cromwell	CT-372 (West St) and CT-524 (Berlin Rd)/ Cromwell Hills Dr	8	2 Bicyclists	Bicyclists struck crossing north and south legs of intersection by turning vehicles.	Provide marked crosswalks Construct multi-use path or sidewalk for CT-372 (West St) corridor	Watch for Me CT Bike and Pedestrian Safety Share the Road Campaign Bike Walk CT
Middletown	CT-3 (Newfield St) and Westfield St	7	2 Pedestrians	One pedestrian struck on shoulder of northbound CT-3 (Newfield St) in dark and wet conditions. Pedestrian struck in marked crosswalk of CT-3 (Newfield St) at Westfield St.	Maintain high visibility crosswalks on all legs of intersection	Watch for Me CT Bike and Pedestrian Safety Bike Walk CT
Middletown	CT-66 (Main St) and Grand St	4	3 Pedestrians, 1 Bicyclist	One pedestrian struck by backing vehicle from angle parking. One pedestrian struck in crosswalk at CT-66 (Main St) under wet, dark conditions. One pedestrian struck on CT-66 (Main St) away from crosswalk in dark conditions. Bicyclist struck on Grand St by turning vehicle on CT-66 (Main St).	Install curb extension on south leg of intersection	Watch for Me CT Bike and Pedestrian Safety Bike Walk CT
Middletown	CT-217 (East St) and W Lake Dr/E Lake Dr	4	2 Pedestrians	One pedestrian struck crossing CT-217 (East St) against traffic signal in dark conditions. One pedestrian struck crossing W Lake Dr in dark conditions.	Install marked crosswalks for all legs of intersection Investigate illumination	Watch for Me CT
Middletown	CT-66 (Washington St) and Plaza Dr	3	2 Pedestrians	Both pedestrians crossing Plaza Dr struck by left-turning traffic from CT-66 (Washington St) in dark conditions.	Install marked crosswalks on north and west legs of intersection Install pedestrian signal heads on north and west legs of intersection Investigate illumination	Watch for Me CT Bike and Pedestrian Safety Bike Walk CT

6. Public Education Resources to Support Behavior Change

Drowsy Driving	Develop evidence-based awareness and educational message strategies that address why drowsy driving is risky, how motorists can prevent drowsy driving, signs and symptoms of drowsy driving, and strategies for dealing with drowsiness as a driver. Investigate drowsy driving legislation and potential for changing awareness and attitudes towards drowsy driving. Identify high-risk drivers for drowsy driving. The National Sleep Foundation has a Drowsy Driving Prevention Week in November to help reduce the number of drowsy driving-related crashes in the United States. Campaign materials are provided for this event through the National Highway Traffic Safety Administration (NHTSA). The United States Department of Transportation (USDOT) Traffic Safety Marketing (TSM) provides a fact sheet, sample news release, and an educational sheet that addresses drowsy driving prevention.						
Resources for Drowsy Driving	National Safety Council	NHTSA	Federal Motor Carrier Safety Administration	National Institute of Health National Heart Lung, and Blood Institute	Center for Disease Control and Prevention		
Speeding	"When Speeding Kills" marketing campaign materials are provided by the CTDOT to encourage safe travel speeds in Connecticut. Alternative campaign materials that share the message "Stop Speeding before it Stops You" are provided by the USDOT's Traffic Safety Marketing (TSM) website. Banner ads, logos, radio ads, television ads, and web videos for speed campaigns are provided by the USDOT Traffic Safety Marketing and NHTSA.						
Resources for Speeding	Traffic Safety Marketing	NHTSA	CTDOT	Governor's Highway Safety Association	Vision Zero	National Transportation Safety Board	
Drunk Driving	The USDOT and NHTSA provide marketing campaign materials for year-round education, such as "Buzzed Driving is Drunk Driving" or "Drive Sober or Get Pulled Over." The USDOT encourages the use of their "No Refusal Toolkit", which is an enforcement strategy that allows jurisdictions to obtain search warrants for blood samples from drivers suspected of drinking who refuse breath tests. The USDOT website explains that this program should be publicized to let the public know that the chance of being caught and facing the consequences of drunk driving is high. Banner ads, logos, radio ads, television ads, and web videos for drunk driving campaigns are provided by the USDOT's TSM and NHTSA. NHTSA also provides a yearly communications calendar that the organization uses to encourage communities to share campaign material by topic at specific times of the year, as an increased awareness strategy.						
Resources for Drunk Driving	Traffic Safety Marketing	NHTSA	Mothers Against Drunk Driving	Center for Disease Control and Prevention	CTDOT	Foundation for Advancing Alcohol Responsibility	
Drugged Driving	NHTSA and the USDOT are working on studies to understand how illegal drugs and prescription medications affect drivers. Provided marketing campaign materials are to be used as tools to raise awareness. The USDOT's TSM provides a fact sheet, sample news release, and an educational sheet that address drug-impaired driving prevention. Banner ads, logos, radio ads, television ads, and web videos for drug-impaired driving campaigns are provided by the USDOT's TSM and NHTSA. NHTSA also provides a yearly communications calendar that the organization uses to encourage communities to share campaign material by topic at specific times of the year, as an increased awareness strategy.						
Resources for Drugged Driving	NHTSA	Traffic Safety Marketing	National Institute on Drug Abuse	Stop Drugged Driving (Institute for Behavior and Health, Inc.)	Governor's Highway Safety Association	CTDOT	Mothers Against Drunk Driving
This resource list is limited and there are various other resources not cited here.							

Public Education Resources to Support Behavior Change

Distracted Driving	NHTSA describes distracted driving as any activity that diverts the attention of the driver from driving, including using electronic devices, eating and drinking, talking to people in your vehicle, changing the station on the radio, entertainment/navigation systems, etc. NHTSA provides resources on its website to educate Americans on the dangers of distracted driving. NHTSA provides suggestions for how teens, parents, employers, and educators can get involved with preventing distracted driving and how to make your voice heard to educate your community. The USDOT provides TSM focused on combating distracted driving through television ads that are available to every community. Banner ads, logos, radio ads, television ads, and web videos for distracted driving campaigns are provided by the USDOT's TSM and NHTSA. NHTSA also provides a yearly communications calendar that the organization uses to encourage communities to share campaign material by topic at specific times of the year as an increased awareness strategy.						
Resources for Distracted Driving	Traffic Safety Marketing	NHTSA	National Safety Council	Governor's Highway Safety Association	Center for Disease Control and Prevention	Insurance Institute for Highway Safety	CTDOT
Pedestrian and Bike Safety	The Watch for Me CT campaign is run by CTDOT in partnership with the Connecticut Children's Medical Center Injury Prevention Center. They share a message of responsibility for everyone on Connecticut roads, including pedestrians and bicyclists. The Watch for Me CT website provides facts about pedestrian crashes, pedestrian laws, and safety tips. The Watch for Me CT website also includes tips for drivers and campaign materials. NHTSA's pedestrian safety web page provides pedestrian safety related research, tips, curriculum, and programs that can be shared in any community to discuss pedestrian safety. The USDOT's TSM website provides campaign materials such as banner ads, media, logos, radio ads, television ads, and web videos for pedestrian campaigns used throughout the country. NHTSA also provides a yearly communications calendar that the organization uses to encourage communities to share campaign material by topic at specific times of the year, as an increased awareness strategy.						
Resources for Pedestrian and Bike Safety	Watch for Me CT	Federal Highway Administration	Vision Zero	NHTSA	America Walks	National Complete Streets Coalition Vision Zero	
Older Driver Safety	Older driver campaigns focus on providing resources for older drivers, their families, caregivers, medical providers, and law enforcement to educate how medical conditions can affect driving, how to assess older driver safety issues, and other transportation options provided in case an older driver's mobility is threatened when they are no longer recommended to drive a motor vehicle. NHTSA provides information for what to do if an individual has concerns about an older driver's ability to drive and what the proper licensing procedures are for older drivers. The USDOT's TSM web page provides marketing resources for the DriveWell campaign that focuses on older driver safety and mobility.						
Resources for Older Drivers	NHTSA	Department of Motor Vehicles	AAA CT	National Institute on Aging	American Association of Retired Persons	Insurance Institute for Highway Safety	
Younger Driver Safety	Crashes are the leading cause of teen deaths, according to NHTSA. Public education campaigns that focus on younger driver safety highlight how to properly prepare younger drivers and their families for the responsibility of driving. NHTSA uses crash trends, safety messages, and various resources to discuss teen driver licensing requirements and key risk factors for younger drivers including illegal use of alcohol, seat belt use, and distracted driving. NHTSA also highlights the importance of influence that parents, educators, coaches, and other trusted adults have on younger drivers and their behaviors. The USDOT's TSM webpage provides posters that communities can share on social media that are specifically marketed towards younger driver safety.						
Resources for Younger Drivers	NHTSA	Traffic Safety Marketing	Department of Motor Vehicles	National Safety Council	National Institutes of Health	Center for Disease Control and Prevention	
Motorcycle Safety	NHTSA's motorcycle safety message focuses on all road users sharing the road, motorcyclists making themselves visible, the use of DOT-compliant helmets, and riding sober. NHTSA provides information on the safest road behaviors. Banner ads, logos, radio ads, television ads, and web videos for motorcycle safety campaigns are provided by the USDOT's TSM and NHTSA. NHTSA also provides a yearly communications calendar that the organization uses to encourage communities to share campaign material by topic at specific times of the year, as an increased awareness strategy.						
Resources for Motorcycle Safety	NHTSA	Traffic Safety Marketing	CT.gov Connecticut Rider Education Program (CONREP) for Motorcycle Safety	Ride-CT	Ride4Ever		

7. Funding

Funding

Department of Energy and Environmental Protection (DEEP) Recreational Trails Funds: Bicycles, Pedestrians, Horseback, Recreational Vehicle
This program is administered through the Connecticut DEEP. Funds can be used for projects, such as new trail construction, maintenance and restoration of existing trails, acquisition of land, or easements for a trail. Note: There is currently no funding available for this program.
Small Towns Economic Assistance Program (STEAP) Funds: Bicycles, Pedestrians, Passenger Vehicles
STEAP funds are issued by the State Bond Commission and can be used for capital projects, which are new construction, expansion, renovation or replacement of existing facilities. The funding is directed towards small towns.
Local Capital Improvement Program (LoCIP) Funds: Bicycles, Pedestrians, Passenger Vehicles
This program provides financial assistance to municipalities for eligible projects in the form of annual entitlement grants funded with State general obligation bonds. LoCIP grants can fund road construction, renovation and repair, sidewalk and pavement improvements, bridges, and bikeway and greenway establishment.
BUILD Discretionary Grants Funds: Bicycles, Pedestrians, Passenger Vehicles
The highly competitive federal grant program is for investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant local or regional impact. BUILD funding can support roads, bridges, transit, rail, ports, or intermodal transportation. This program replaces the previous TIGER grant program.
Highway Safety Programs Funds: Driver and Passenger Behavior
The Connecticut Highway Safety program supports Federal Section 402 highway safety grant funds that are made available to the State to carry out its annual Highway Safety Plan. Grants are issued to address programs pertaining to impaired driving, public information and education, work zone safety and highway safety related legislation, police traffic services, occupant protection, and child passenger safety.
Federal-Aid Essentials for Local Public Agencies
This website provides local public agency staffers a centralized hub for guidance, policies, procedures, and best practices for administering federal-aid projects. The website includes a library of videos covering key aspects of the project development and delivery process.

Funding

Local Transportation Capital Improvement Program (LOTCIP) Funds: Bicycles, Pedestrians, Passenger Vehicles, Transit, Bridges
Provides State monies to municipalities for transportation capital improvement projects. Regional Planning Organizations are responsible for soliciting and selecting projects and administering the program. Eligible projects include reconstruction, pavement rehabilitation, sidewalks, and multi-use trails. Except for off-road bike projects, all projects must be located on/along federally eligible roadways.
Transportation Alternatives (TA) Set-Aside Program Funds: Bicycles, Pedestrian
Provides federal funding, half administered through the State and half administered through Regional Planning Organizations for surface transportation projects in categories that are not typically eligible for funding under other federal sources. Bicycle and pedestrian projects have typically been targeted for these funds.
Congestion Mitigation and Air Quality (CMAQ) Funds: Bicycles, Pedestrians, Passenger Vehicles, Transit
The Congestion Mitigation and Air Quality program is managed by the CTDOT as a competitive grant program. A portion of funding is programmed for projects of regional significance. It provides funds for projects that will improve air quality such as congestion reduction and traffic flow improvements, transit improvements, and pedestrian and bicycle facilities.
Community Connectivity Program (CCP) Funds: Bicycles, Pedestrians
This Program offers Connecticut's towns and cities assistance in conducting Road Safety Audits (RSA) at important bike and pedestrian corridors and intersections. An RSA is a process that identifies safety issues and countermeasures to help improve safety and reduce vehicle crashes. Note: Several notable adjustments have been made to the program guidelines and selection criteria for the upcoming solicitation. The funding limits for grant awards have increased to range between $125,000 and $600,000. In addition, general program objectives have been refined to reinforce the concept of transportation equity by connecting underserved communities. The latest round of grant applications was submitted in October 2020.

8. Emphasis Areas

The top emphasis areas in the Lower Connecticut River Valley Region were selected based on the conclusion that these contributed to the majority of the injury and fatal crashes verified from the 2015-2019 data. The seven emphasis areas are:

1. **Critical Roadway Locations: Includes both intersections and roadway departure crashes.**
2. **Driver Behavior: Includes aggressive driving, unrestrained occupants, substance-impaired driving, and distracted driving.**
3. **Young Drivers: Includes drivers aged 15-25 years old.**
4. **Older Drivers: Includes drivers aged 65 years and older.**
5. **Motorcyclist Safety.**
6. **Non-Motorized Users: Includes pedestrians and bicyclists.**
7. **Traffic Incident Management.**

These emphasis areas were selected based on crash types that have the highest potential of achieving the State's injury and fatal crash rate reduction goal and fatal crash rates. From these identified emphasis areas, strategies and countermeasures were developed in conjunction with stakeholders' input. Each emphasis area's countermeasures were developed according to the four E's of transportation safety. Totals of all injury and fatal crashes by emphasis area can be found in Appendix B.

Performance Measures: The Lower Connecticut River Valley RTSP follows the 2017 CT SHSP strategy of implementing countermeasures identified for each emphasis area. In all cases, implementation includes site-specific and systemic safety improvements. Connecticut has set annual safety performance measure targets which the regions are encouraged to follow. The region can also establish their own performance measures, independent of the State's goals.

CT-80, Deep River. Source: VN Engineers

8.1 Critical Roadway Locations

The critical roadway locations emphasis areas include both roadway departure and intersection crashes. Intersection crashes are conflicts that occur due to complex travel patterns. Congestion, limited sight distance, driver behavior, and other variables exacerbate the inherent crash potential at each intersection. Intersections vary widely from geometry, classification (urban or rural), traffic control (signalized or unsignalized), traffic volumes, and design (conventional design or alternative designs like roundabouts). Additionally, at-grade rail crossings are considered intersections, as trains and roadway users cross paths. Reducing the number of intersection injuries and fatalities is possible by applying a multidisciplinary approach, using strategies that focus on engineering, education, and enforcement.

Roadway departure crashes are described as conflicts that result when vehicles cross an edge line, a centerline, or otherwise leave a travel lane. There are several factors that can contribute to a lane departure crash, including roadway characteristics like horizontal curvature and pavement condition. Other weather-related conditions like rain, snow, or ice can impede a driver's sight of the roadway and make controlling vehicles difficult. The time of day can also play a role in lane departure crashes due to decreased visibility, which can affect the drivers' abilities to maintain their vehicles' alignment.

Behavioral issues like speeding, impaired driving, and distracted driving can affect the drivers' safe vehicle operation and may cause them to depart from the roadway. To improve lane departure safety, countermeasures that address keeping vehicles in the travel lane, provide for a safe recovery, and reduce crash severity are imperative. The Region can use both systemic and site-specific engineering strategies combined with education and enforcement.

8.1.1 Intersections

Performance Measure: From 2015-2019, there were 1,403 intersection crashes resulting in injuries or fatalities within the Lower Connecticut River Valley Region or an annual average of 281 crashes per year. Of those 1,403 intersection injury and fatal crashes reported, 13 were fatal. The Region's 2015-2019 intersection injury and fatal crashes make up 2% of the 69,885 intersection injury and fatal crashes in Connecticut.

Performance Objective: Decrease intersection injuries and fatalities over the five year period of the RTSP.

Strategies for Intersections:

Engineering: Implement proven and low-cost spot improvements and systemic safety improvements to reduce intersection crashes. Examples include enhancing signs and pavement markings, modifying signals and signal timing, adding turn lanes, and controlling access through medians. Consider No Turn on Red restrictions at identified crash locations. Review sightlines and trim vegetation where applicable.

Enforcement: Conduct high-visibility enforcement, media campaigns and public outreach at selected locations with a significant number of intersection crashes.

Education: Advertise and promote the Safety Circuit Rider and other similar programs that provide training and outreach about intersection safety.

Engineering: Incorporate safety elements and countermeasures into all regional roadway and intersection project designs and maintenance improvements.

8.1.2 Roadway Departures

Performance Measure: From 2015-2019, there were 887 roadway departure crashes resulting in injuries or fatalities within the Lower Connecticut River Valley Region. This is an average of 177 crashes annually per year. Of those 887 reported roadway departure crashes, 33 were fatal. The Region's roadway departure injury and fatal crashes accounts for 4% of the 21,068 total roadway departure injury and fatal crashes in Connecticut.

Performance Objective: Decrease injuries and fatalities over the five year period of the RTSP.

CT-66, Portland, CT. Source: VN Engineers

Strategies for Roadway Departures:

Engineering: Design the roadside to include protection systems (such as cable median, crash cushions and guiderail end treatments) or manage roadside vegetation, trees, and other fixed objects to minimize the severity of crashes.

Engineering: Implement proven systemic safety countermeasures to lessen roadway departure crashes. Examples include high friction surface treatments, improved signage and pavement markings on curves, safety edges, and center line and edge line rumble strips.

Enforcement: Conduct high-visibility regional and local enforcement, media campaigns, and public outreach on identified corridors with a high number of severe roadway departure crashes.

Education: Utilize established regional and State programs, such as the Safety Circuit Rider, to provide education, training, and outreach.

Source: kwikbondpolymers.com

8.2 Driver Behavior

The second emphasis area is driver behavior, which includes the subset areas of speeding or aggressive driving, unrestrained occupants, substance-impaired driving, and distracted driving. These subsections are related to driver behavior and not due to traffic or roadway characteristics, although they can be interdependent.

Source: icsw.nhtsa.gov

8.2.1 Aggressive Driving

The aggressive driving emphasis area includes any driver behavior that involves speeding, recklessness, driving too close, running red lights, and making unsafe lane changes. Any behavior that "exceeds the norms of safe driving" and places other motorists in danger is considered as aggressive driving. This does not include road rage, which is considered assault.

Performance Measure: Speeding-related injury and fatal crashes totaled 612, 19 of which were fatal. This yields an annual average of 122 injury and fatal crashes per year 2015-2019. The 2015-2019 Lower Connecticut River Valley Region's aggressive driving injury and fatal crashes make up 8% of the 7,458 total aggressive driving injury and fatal crashes in Connecticut.

Performance Objective: The Region's objective is to lower the average of speed related deaths per year by 2026.

Strategies for Aggressive Driving:

Engineering/Enforcement: Explore the possibility of creating safety corridors where a segment of roadway has higher-than-expected number of fatal and serious injury crashes due to driver behaviors. Further strategies include additional signage, increased traffic enforcement, and zero tolerance for violations.

Enforcement: Regional and municipal support for high-visibility enforcement campaigns that specifically target speed and aggressive driving. This could include enhanced patrols using roads signs, electronic message boards, and command posts.

Enforcement: Regional collaboration and resource sharing of scientifically valid speed measurement technology for enforcement.

Education: Coordinate with local agencies, local police and fire departments, hospitals, the auto insurance industry, and driving schools to disseminate and educate the public on the hazards of aggressive driving.

Engineering: Integrate the speed management countermeasures into roadway departure, intersection, and pedestrian safety areas.

Source: Courant.org

8.2.2 Unrestrained Occupants

The unrestrained occupants emphasis area involves either passengers or drivers who do not wear seat belts while traveling, including children not properly positioned in restraint systems. Connecticut enacted a law in October 2017, requiring that children be in booster seats until they reach a minimum of 60 pounds and they turn eight years old, that toddlers ride in a forward-facing seat with a five-point harness until they are 5 years old and weigh at least 40 pounds, and that infants be in rear-facing seats until they are two years old and 30 pounds.

Performance Measure: From 2015-2019, there were 173 crashes involving unrestrained occupants that resulted in injury or fatality, which is an average of 35 crashes per year. Out of these 173 crashes reported, 9 of them were fatal. The Lower CT River Valley Region's unrestrained occupant injury and fatal crashes make up 4% of the 4,888 total unrestrained occupant injury and fatal crashes in Connecticut.

Performance Objective: Reduce the number of unrestrained occupant injury and fatal crashes from the five-year average by 2026 and increase the statewide observed seat belt use rate. In 2019, Connecticut surpassed its goal of 88% seat belt compliance rate to 93.7%.

8.2.3 Substance-Impaired Driving

Substance-impaired driving involves motorists who are under the influence of alcohol and/or drugs, both prescribed/non-prescribed, and/or illegal. A driver with a Blood Alcohol Concentration (BAC) of 0.08 or higher is considered alcohol impaired. Drug impairment is more challenging to detect and confirm because there is no standard breathalyzer test. In addition, it is hard to determine drug effects on driving behavior, which also makes it difficult to develop effective laws and strategies for enforcement. However, according to NHTSA, many of the alcohol-impaired driving countermeasures may deter drug-impaired driving.

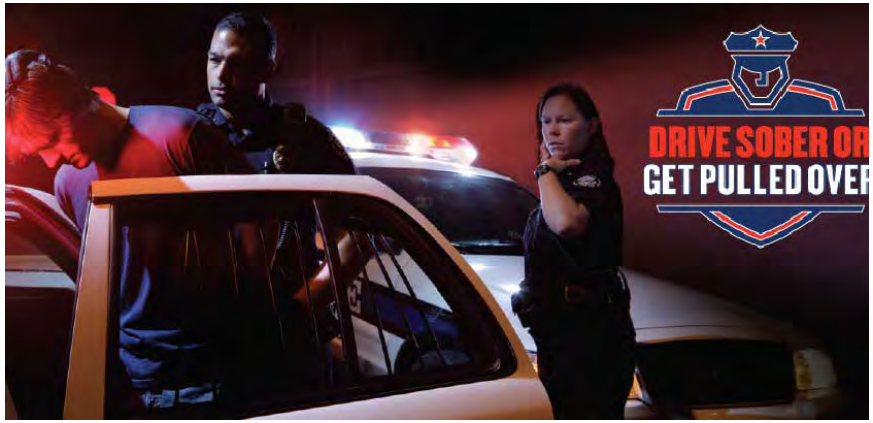
Strategies for Unrestrained Occupants:

Enforcement: Coordinate with NHTSA's calendar of high-visibility enforcement of safety belts and child safety enforcement and coordinate with AAA, CTDOT, and T2 Center to explore potential educational/ outreach efforts promoting seat belt use. Continue regional and municipal enforcement using checkpoints, roving, and saturation patrols.

Education: Communicate the new child safety seat laws, coordinating with multiple agencies like Safe Kids CT, local police and fire departments, hospitals in the Region, the YMCA, and others to disseminate information and educate the public.

Enforcement and Education: Coordinate with private sector stakeholders to host car seat clinics and publicize the safe fitting stations in the region using earned media outlets.

Source: VN Engineers



Source: Portal.ct.gov

Performance Measure: From 2015-2019, there were 195 reported substance-impaired driving crashes that resulted in injury or death, which is an annual average of 33 crashes per year. Of these 165 crashes, 11 were fatal. The Lower Connecticut River Valley Region's substance-impaired injury crashes make up 5% of the 3,364 statewide substance-impaired injury and fatal crashes.

Performance Objective: Increase the number of Drug Recognition Expert (DRE) practitioners in the Lower Connecticut River Valley Region by 2026.

Source: Madd.org

Strategies for Substance-Impaired Driving:

Enforcement and Education: Encourage the State to provide the funding for officers to take the Advanced Roadside Impaired Driving Enforcement (ARIDE) program and to get certified as Drug Recognition Experts (DRE) offered by the Department of Emergency Services and Public Protection. Cooperate with the SHSP goal to increase the number of certified standardized field sobriety test practitioners and instructors.

Education: Expand regional and municipal-specific outreach of impaired driving beyond the traditional mass media campaign by using innovative and unique delivery methods that reach specific populations of the targeted audience through local police and fire departments, the hospitals in the region, the YMCA, and driving schools to disseminate information and educate the public. Highlight the importance of sober driving during the month of December, during the Office of National Drug Control Policy's National Drunk and Drugged Driving Prevention month, and NHTSA's drive sober or get pulled over mobilization.

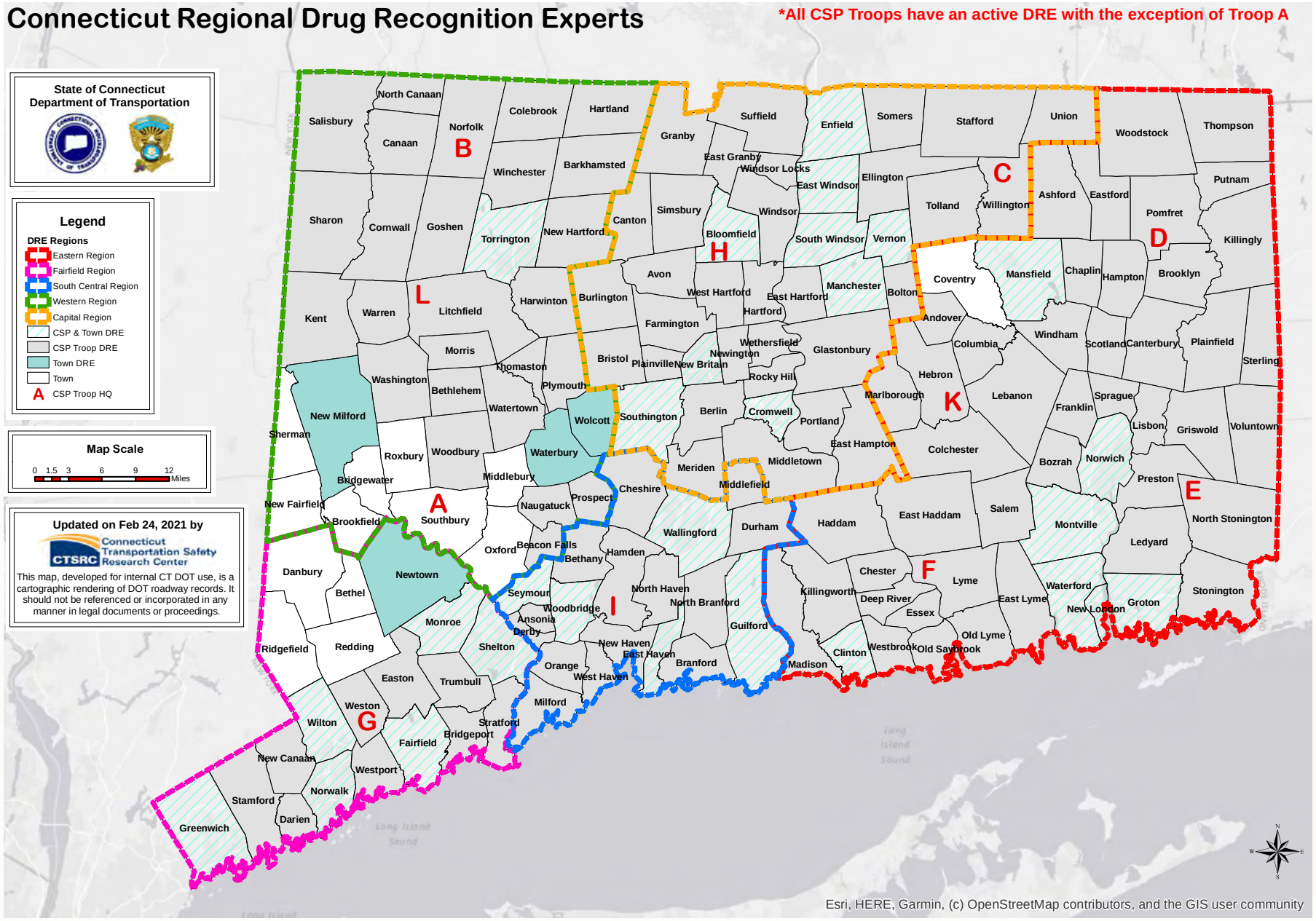
Education: Continue to support Mothers Against Drunk Driving (MADD) CT chapter's outreach and education efforts, including the Victim Impact Panels that take place near the RiverCOG Region.

Engineering: Municipalities should support policies and programs that increase the availability, convenience, affordability, and safety of transportation alternatives for drinkers who may drive especially during nighttime and weekend hours and boosting or incentivizing transportation alternatives in rural areas, which are disproportionately impacted by alcohol-impaired driving crashes and fatalities.

Enforcement: Continue to enforce the interlock devices for all Connecticut DUI/DWI/OUI first time offenders. Conduct regional high-visibility impaired driving enforcement program.

Connecticut Regional Drug Recognition Experts

*All CSP Troops have an active DRE with the exception of Troop A



8.2.4 Distracted Driving

Distracted driving is another subset of the driver behavior emphasis area. It involves any motorist whose attention is diverted by a variety of activities besides navigation. Common sources of driver distraction are cell phone use, eating, drinking, or adjusting the radio. Due to the increase of text messaging, GPS navigation systems, and other technologies, distracted driving is on the increase.

Performance Measure: From 2015-2019, there were 174 reported injury and fatal crashes related to distracted driving, an average of 35 crashes annually. One of the 174 crashes was fatal. The Lower Connecticut River Valley Region's distracted driving injury and fatal crashes make up 5% of the total 3,652 distracted driving injury and fatal crashes in Connecticut.

Performance Objective: The performance objective is to decrease injuries and fatalities as a result of crashes caused by driver distraction, especially those caused by handheld mobile phone use focused on increasing high visibility enforcement (HVE) activities by 2026.

Source: NHTSA

Source: CTpost.com

Strategies for Distracted Driving:

Enforcement: Conduct distracted driver observational surveys, similar to those done for seat belt use.

Enforcement: Update to the Model Minimum Crash Criteria (MMUCC) 5th Edition to include distraction on involved non-motorists crashes.

Enforcement: Regionally conduct high-visibility distracted-related enforcement, focusing on municipalities with a higher rates of distracted driving related injuries and fatalities.

Enforcement: In addition to high visibility enforcement, use unmarked patrol vehicles or spotter techniques in high traffic areas.

Education: Increase regional public outreach of distracted driving that reaches specific populations of the targeted audience. Coordinate with NHTSA's calendar of outreach.

Education: Coordinate distracted driver messages with multiple agencies: DMV, AAA CT Chapter, Local and State law enforcement, Emergency Management Services, hospitals in the region, the YMCA, and driving schools to disseminate information and educate the public.

8.3 Young Drivers

Young drivers are motorists between the ages of 15-25. Due to their driving inexperience and behavior that can involve an increase in novelty seeking and risk-taking, this subset of drivers is at a greater risk of being involved in traffic crashes.

Connecticut has a graduated driver licensing (GDL) program, limiting passenger allowance in the first 12 months of licensing, imposing a driver curfew until their 18th birthday, requiring all passengers in vehicles to use seat belts, and prohibiting all use of cell phones and mobile electronic devices while driving. The State also requires pre-licensure driver education for drivers and parents.

Performance Measure: From 2015-2019, there were 760 crashes involving young drivers that ended in injuries or fatalities, an average of 152 crashes annually. Of these 760 crashes 10 were fatal. The Region's young driver injury and fatal crashes make up 4% of the 20,592 young driver injury and fatal crashes in Connecticut.

Performance Objective: Decrease the Region's five-year average young driver fatal crashes by the year 2026.

References:

IMPACT is a nonprofit organization whose members have either lost teenage family members or friends in motor vehicle crashes, or are survivors of crashes involving teen drivers. !MPACT's mission is to eliminate tragedies caused by inexperienced drivers through awareness, education and legislation. !MPACT has developed a teen driving safety program in which members share their personal experiences. Teens also learn about statistics, risk factors and how to protect themselves and others.

Zero Tolerance Law: In Connecticut, if a driver under the age of 21 has more than a trace of alcohol (.02 BAC or higher) in their system, they will be subjected to a three month license suspension.

Source: Driversed.com

Strategies for Young Drivers:

Engineering, Education, Enforcement: Continue regional support for statewide GDL programs.

Enforcement: Regional education and enforcement of young driver laws, including the State's .02 BAC laws for young drivers by organizing and conducting high-visibility enforcement campaigns.

Enforcement: Explore the possibility of a license plate decal to identify motorists in the GDL program, so that law enforcement can more readily distinguish them.

Education: Coordinate young driver messages with multiple agencies in Spanish and English at DMV offices, auto insurance agencies, AAA CT Chapters, State and local law enforcement agencies, Emergency Management Services, public and private schools, local chapters of the YMCA, and the State Board of Education. Continue to promote IMPACT Programs which offer teen driving safety programs to high schools, hospitals, religious organizations, and other communities at no cost. https://www.impactteendrivers.org/gdl/connecticut.

8.4 Older Drivers

The fourth emphasis area is older drivers, which are categorized as drivers 65 years and older. Although age itself is not the principal determinant in driving performance as people age their mental and physical abilities change, which can affect their driving. The most common of these conditions is poor vision, but other cognitive skills may be affected, including memory and coordination. Older drivers crash survivability is a major safety concern.

Performance Measure: From 2015-2019, there were 472 crashes in the Lower Connecticut River Valley Region involving older drivers that ended in injuries or fatalities, an average of 94 crashes annually. Of the 472 older driver crashes from 2015-2019, 13 were fatal.

This Region's 2015-2019 older driver injury and fatal crashes make up 4% of the total 10,508 older driver injury and fatal crashes in Connecticut.

Performance Objective: Decrease the number of drivers aged 65 or older involved in fatal crashes per year by 2026.

Source: NHTSA

Strategies for Older Drivers:

Education: Consider supporting stricter CTDMV policy of license renewal for senior drivers and consider mandatory in-person tests with vision exams for drivers 65 years and older.

Education: Coordinate with multiple agencies including the United Way of Middletown-Central Agency on Aging, the various local chapters of the YMCA, and the Connecticut Association of Senior Center Personnel to address older driver challenges and general safety.

Education: Promote NHTSA's DriveWell Toolkit to aid older drivers.

Education: Continue to promote alternative ways for older people to get around and promote Know How to Go website.

Education: Encourage older drivers to attend AARP Smart Driver Course available online or in-person. Currently there are no in-person classes in the region due to Covid restrictions. Check the website for future in-person classes: https://secure.aarp.org/applications/VMISLocator/searchDspLocations.action?intcmp=ATT-DSP-Locator.

Source: NHTSA

8.5 Non-Motorized Users

The non-motorized users emphasis area includes crashes involving pedestrians and bicyclists. Pedestrians and bicyclists are more susceptible to injuries and fatalities when involved in a crash with a motor vehicle. Pedestrian friendly environments are consistent with complete streets, desirable residential and employment sites, and sustainable/low cost transportation.

From 2015-2019, there were 222 crashes that resulted in bicyclist or pedestrian injuries or fatalities within the Lower Connecticut River Valley Region. Eight (8) of these 222 crashes were fatal.

Source: one.nhtsa.gov

8.5.1 Pedestrians

Performance Measure: From 2015-2019, there were 159 injury and fatal pedestrian crashes in the Lower Connecticut River Valley Region, 6 of these were fatal. That is an average of 32 crashes per year. The Region's pedestrian injury and fatal crashes make up 3% of the total 5,241 pedestrian injury and fatal crashes in Connecticut.

Performance Objective: The Lower Connecticut River Valley RTSP is in congruence with the SHSP's goal of reducing pedestrian injury and fatal crashes over the 5-year period of the SHSP ending in 2026.

CT-154 (Middlesex Avenue) Deep River, CT. Source: VN Engineers.

8.5.2 Bicyclists

Performance Measure: From 2015-2019, there were 63 bicycle crashes in Lower Connecticut River Valley Region and 2 were fatal. That is an average of 13 injury and fatal crashes per year. The Lower Connecticut River Valley Region's bicyclist injury and fatal crashes make up 3% of the 1,883 injury and fatal bicycle crashes in Connecticut.

Performance Objective: The Lower Connecticut River Valley RTSP is in congruence with the SHSP goal of decreasing bicyclist injuries and fatalities by 2026.

Strategies for Non-Motorized Users

Education: Coordinate with state, regional, and local advocacy groups and bike store owners, including Bike Walk CT, the CTDOT Bike and Pedestrian Advisory Board, and other stakeholders to strategize best practices for the region.

Engineering: Coordinate with CTDOT on the *Pedestrian Signing and Pavement Marking Project,* which improves crosswalk visibility on local roads.

Education and Enforcement: Promote the Watch for Me CT Program.

Education: Regionally promote the CT Bike Ped Plan interactive bike map.

Engineering: Encourage municipal and regional adoption of the CTDOT's Complete Streets Policy, which ensures that the needs of all users of all abilities and ages (specifically including pedestrians, bicyclists, transit users, and vehicle operators) are addressed in the planning, programming, design, construction, retrofit, and maintenance activities related to all roads and streets, as a means of providing a "safe, efficient transportation network which enhances quality of life and economic vitality."

Engineering: Promote the regional pedestrian and bike projects included in the Transportation Improvement Program (TIP) 2021-2024.

Education and Enforcement: Educate regional law enforcement personnel on the 2014 Vulnerable User Law and the 2015 Bike Bill.

Education: Promote the Connecticut Technology Transfer Center's educational outreach initiatives that promote bike and pedestrian safety.

CT-66, Middletown, CT. Source: VN Engineers

8.6 Motorcyclist Safety

Motorcyclist safety is an area of traffic concern both regionally and nationally. According to NHTSA 2015 Countermeasures that Work report, "per vehicle mile traveled, motorcyclists are about 26 times more likely than passenger car occupants to die in traffic crashes". (NHTSA Countermeasures that Work, 2015 8th edition). A motorcyclist travels at the same speeds and in the same lanes as other motorized vehicles, but without the same degree of protection.

Performance Measure: From 2015-2019, there were 263 motorcycle crashes that ended in injury or fatal to the persons involved, and of which 17 crashes were fatal. The annual average for injury and fatal motorcycle crashes is 53 crashes per year. The Lower Connecticut River Valley Region's motorcycle injury and fatal crashes make up 6% of the 4,554 total motorcycle injury and fatal crashes in Connecticut.

Performance Objective: The Lower Connecticut River Valley RTSP is in congruence with the SHSP goal of decreasing the number of motorcyclist fatalities from the five-year average by 2026, especially the number of unhelmeted fatalities. This could be accomplished through increased media outreach and encouragement of motorcycle riders to wear protective clothing and gear.

Strategies for Motorcyclist Safety:

Education: Continue to endorse CT DMV's Connecticut Rider Education Program (CONREP) for motorcycle safety in locations near the Lower Connecticut River Valley Region.

Engineering, Education, Enforcement: Continue to support the insurance industry's rate discount for CONREP graduates.

Engineering, Education, Enforcement: Coordinate with local motorcycle dealerships, CT DMV, hospitals in the region. and other public and private sector agencies to promote safety campaigns, encouraging riders to wear helmets, goggles, protective clothing and gear, and for motorists to share the road. These campaigns can be amped up during May's Motorcycle Safety Awareness Month.

Education, Enforcement: Regionally support None for The Road campaign and the www.ride4ever.org, encouraging riders to not drink and ride and to ride safely.

Education: Regionally promote various motorcycle safety awareness resources, such as Helmetcheck.org, the Motorcycle Safety Foundation, Interactive Scenic Ride Map, and CT Travel Smart websites.

Source: Ride-ct.com

Source: NHTSA

8.7 Traffic Incident Management

A traffic incident is an event (such as a vehicle crash, work zone activity, or vehicle breakdown) that disrupts the normal operation of the transportation system. Traffic incidents are an important concern in Connecticut because they can potentially cause safety issues, increasing the risk to uninvolved motorists, congestion delays, and secondary incidents. The CTDOT recommends a statewide Traffic Incident Management (TIM) plan be implemented to coordinate the use of human, institutional, mechanical, and technological resources to reduce the duration and impact of incidents.

TIM consists of a "planned and coordinated multidisciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible." Effective TIM reduces the duration and impacts of traffic incidents, improves the safety of motorists, crash victims, and emergency responders.

Performance Objectives: In congruence with the CT SHSP's goals, the Lower CT River Valley Region's goal is to promote the safety of motorists, crash victims, and incident responders by reducing secondary crashes and associated fatalities and serious injuries. In order to achieve this goal the region could increase its first responders in incident management training.

Source: Learning.respondersafety.com

Strategies for Traffic Incident Management

Education: Support the CT SHSP objective to establish a statewide TIM program, with a lead agency to administer clearly defined responsibilities that meet the requirements of the National Incident Management System (NIMS).

Education: Continue to support the CT Travel Smart website and to promote this resource regionally through media and public outreach campaigns. *Education:* Continue to conduct public awareness programs for effective on-scene TIM by road users.

Education: Continue the planning, implementation, and coordination of activities, such as the adoption of a Unified Response Manual, updating of diversion plans, TIM training, and participation in the FHWA annual TIM Self-Assessment. Also, work on the development and implementation of a public awareness campaign for motor vehicle laws relating to highway incidents, such as the "Move It" and the "Move Over."

Education: Continue to research the benefits and impacts of providing a regional approach to operating and maintaining local traffic signal systems. Collaborate with the Greater Hartford TIM Coalition to develop best practices.

Education, and Enforcement: Continue to implement the goals from the ITS Strategic Plan for the RiverCOG Region and the goals in the LRTP.

Enforcement: Support the State operated State Farm Safety Patrol Program.

Enforcement: Conduct after action reviews to improve response and scene management.

Engineering: Continue collaborating with CTDOT to implement ITS to update the freeway traffic management system and improve incident management efforts.

Engineering: Include Weather Responsive Traffic Management (WRTM) strategies, such as Road Weather Information Systems (RWIS).

Engineering Education, and Enforcement: Support the development and tracking of TIM performance metrics following national standards and definitions.

9. Technological Advances Affecting Traffic Safety

9.1 Connected and Autonomous Vehicles

Connected and Automated Vehicle (CAV) technologies need to be considered as they are rapidly advancing and will continue to play an integral role in traffic safety and crash reductions. According to NHTSA, of all serious motor vehicle crashes, "94% are due to human error or choices. Fully automated vehicles that can see more and act faster than human drivers could greatly reduce errors, the resulting crashes, and their toll." Connecticut's Fully Autonomous Vehicle Testing Pilot Program (FAVTPP), an initiative created by legislation that former Governor Dannel Malloy signed into law in April 2018, will help bring Connecticut to the forefront of the innovative and burgeoning autonomous vehicle industry. Under the terms of the program, towns and cities that are interested in participating and allowing the testing of fully autonomous vehicles on their roadways have submitted their applications to the State.

Currently, many motor vehicles have automated technology that increases their safety, such as forward collision warning, automatic emergency braking, lane departure warning and lane keeping assist, safe distance maintenance, backing up, and parking assist. These and other safety technologies can warn the driver to potentially avoid a crash.

Connected vehicles can communicate with other connected vehicles using wireless technology. This technology can alert drivers to dangerous conditions related to other vehicles. Automated vehicles are vehicles that rely on various onboard automated systems, many times in combination, to operate a motor vehicle. Vehicle automation is presently being advanced by many companies and by many methods. NHTSA has categorized 5 levels of automation, with the highest level being driverless operation, and has developed guidelines for vehicle automation, including best practices for State agencies.

9.2 Concerns with Data Collection

Connecticut uses the MMUCC developed by the NHTSA and the Governors Highway Safety Association (GHSA).

The purpose of this is to standardize data nationally, so that collected data can be compared and used for strategies to prevent crashes. There are some factors that affect traffic safety that are difficult to observe and measure:

- *Alcohol and drugs, low alcohol concentration, other drugs including prescription, illicit, and over-the- counter drugs*
- *Fatigue and distraction*
- *Communications technologies and advanced driver assistance systems*
- *Factors involving teen or novice driving*

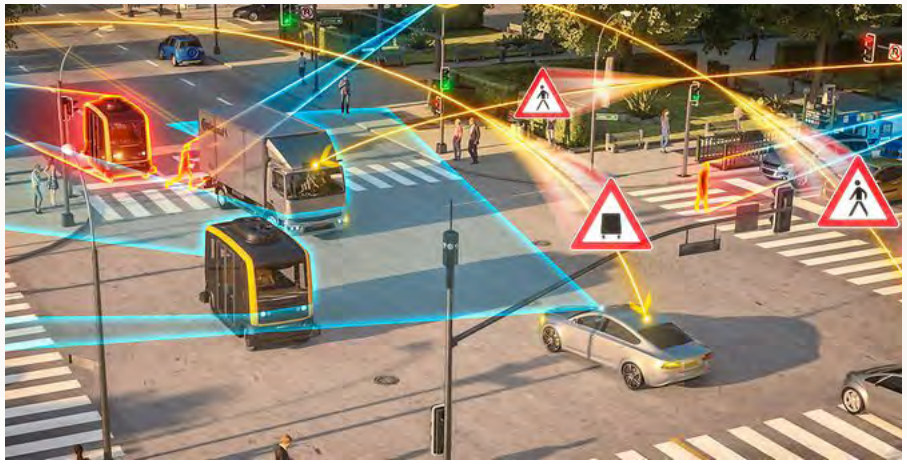
MMUCC no longer defines how data elements should be collected (at scene/linked or derived). States are encouraged to link or derive data wherever possible to minimize the impact on law enforcement.

Strategies for Connected and Autonomous Vehicles

Engineering: Regionally support the development of CAV technology and best practices.

Engineering: Regionally encourage municipal participation in the State's newly launched FAVTPP. Applications can be found on the Office of Policy and Management website.

Engineering: Improve and standardize Geographic Information System (GIS) mapping and spatial capabilities in all 17 municipalities.



Source: Continental.com

10. Implementation, Evaluation & Update Requirements

10.1 Implementation

The Lower Connecticut River Valley RTSP is a supplemental document to the Metropolitan Transportation Plan (MTP), the Transportation Improvement Plan (TIP), and the Unified Planning Work Program (UPWP). Collectively, these plans can assist the region in prioritizing projects that will improve roadway safety. The member municipalities should be dedicated to the implementation of safety improvements and the reduction of fatal and injury crashes based on appropriate countermeasures, some of which are included in this report.

RiverCOG, member municipalities, and CTDOT have provided their local and regional knowledge, input, and strategies to this safety plan. Development of this plan was an iterative process, with municipal and regional input included from the onset. Throughout the implementation of this plan, RiverCOG staff and the MPO Board can provide guidance and be dedicated to bringing appropriate strategies to fruition.

RiverCOG could provide oversight of this safety effort and report progress to the member municipalities at least once a year. Each emphasis area could be reported once a year at a RiverCOG monthly meeting, to ensure progress is being made and to provide member municipalities the opportunity to evaluate the implemented strategies. It is recommended that the implementation of each strategy be documented, and the performance measures monitored to provide transparency and ensure progress. Reporting could detail current strategy activities, accomplishments, safety performance measures, and any issues that may need additional support or guidance.

10.2 Evaluation

RiverCOG will use the Connecticut SHSP evaluation process to guide how the RTSP is evaluated. The SHSP must meet the requirements of the 2016 FHWA Guidance on Strategic Highway Safety Plans and the FAST Act. Once an appropriate evaluation and reporting time period has been determined, reports will include information on the strategies that have been implemented (see Section 7), accomplishments, performance measures, best practices, and any lessons learned.

Areas for Evaluation and Implementation:

- *Are strategies current and relevant to ongoing data trends?*
- *Are strategies being incorporated into local, regional, and state projects?*
- *Is the data showing that fatalities and injuries in RiverCOG are trending towards a 15% reduction by 2022?*
- *Does the annual reporting reflect the RTSP performance objectives?*

Reporting should include information on which strategies are being implemented, what goals have been accomplished, the progress of performance measures, best practices and any lessons learned.

Recommended Steps to be taken by RiverCOG

- *Annual reporting of RTSP strategies and performance measure progress.*
- *Coordination with CTDOT's SHSP committee and emphasis area sub committees to collaborate on state and regional goals.*
- *Annual review of goals and development of new strategies when warranted.*

CT-156 at Marvin Cemetery, Lyme, CT. Source: VN Engineers

10.3 Updating the RTSP

The Regional Transportation Safety Plan is a living document congruent with the CT SHSP. Federal regulations require an update for the SHSP every five years and this regional safety plan will follow this same update process, ensuring federal compliance. If feasible, each COG is responsible for updating their regional transportation safety plan every five years. This plan was prepared by VN Engineers under contract of CTDOT, with the understanding that RiverCOG's commitment to provide oversight, annually report progress, and update the RTSP every five years will require additional financial support from the CTDOT, as was provided for the funding of this initial plan. The regional plan will adhere to the same mandates, with updates reflecting the most current federal surface transportation legislation.

10.4 Implementation Periods Defined

For the purposes of the RTSP, short-term is understood to mean modifications that can be expected to be completed very quickly, perhaps within six months, and certainly in less than a year, if funding is available. These include relatively low-cost alternatives, such as striping and signing, and items that do not require additional study, design, or investigation (such as right-of-way acquisition). Mid-term recommendations may be costlier and require establishment of a funding source, or they may need some additional study or design before implementation. Nonetheless, they should not require significant lengths of time before they can be implemented. Typically, they should be completed within a window of eighteen months to two years. Long-term improvements are those that require substantial study and engineering and may require significant funding mechanisms and/or right-of-way acquisition. These projects generally fall into a horizon of two years or more after funding is secured.

10.5 Other Resources

The Connecticut Technology Transfer Center's Safety Circuit Rider Program and the Traffic Signal Circuit Rider Program are statewide programs aimed at reducing the frequency and severity of injury and fatal crashes by assisting and supporting local road safety authorities. Both programs offer safety-related information, educational programs, technical assistance, and various training opportunities at no cost to all Connecticut municipalities.

The following assistance is available through the Safety Circuit Rider Program:

- Coordination of Road Safety Assessments (RSAs).
- Collection and analysis of traffic volume data.
- Identification of low-cost safety improvements.
- Assistance in the development of local road safety plans.
- Development of a Connecticut Toolbox of Safety Resources.
- Development of a series of roadway safety briefs.
- Delivery of local road safety training.

The following assistance is available through the Traffic Signal Circuit Rider Program:

- Support for the development of management plans with clear goals and objectives for the operation, maintenance, and design of traffic signal infrastructure
- Training on traffic signal topics relevant to local agencies through seminars, technical briefs, and site visits
- Assistance for the development of traffic signal timing at isolated intersections and coordinated systems, including evaluating relevant performance measures
- Promotion of opportunities for federal-aid funding for traffic signal operations and encourage the integration of traffic signal operations into metropolitan transportation plans and programs
- Equipment Loan Program

Source: CT T2 Center

Appendix A

Municipal Reports

Introduction to the Individual Municipal Reports

The following municipal reports provide a more in-depth analysis and overview of traffic safety in each of the 17 RiverCOG member municipalities.

Each municipal report includes basic demographic information, data identified corridors, and intersections, as well as bike and pedestrian crash totals. In addition to the data-identified sites, locations that exhibit safety concerns for municipal representatives were documented. From the data-identified and prioritized locations, systemic improvements and site-specific strategies were developed to minimize or prevent fatal and injury crashes in the future. These are listed in tabular format with estimated costs.

CT-151 (Moodus Road) Town of East Hampton, CT. Source: VN Engineers

TOWN OF CHESTER

2020 Population Estimate: 3,876

Area: 16.0 square miles

Population Density: 242 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 56,566,218

Latest (2016) VMT per Capita: 14,594

Setting: Rural

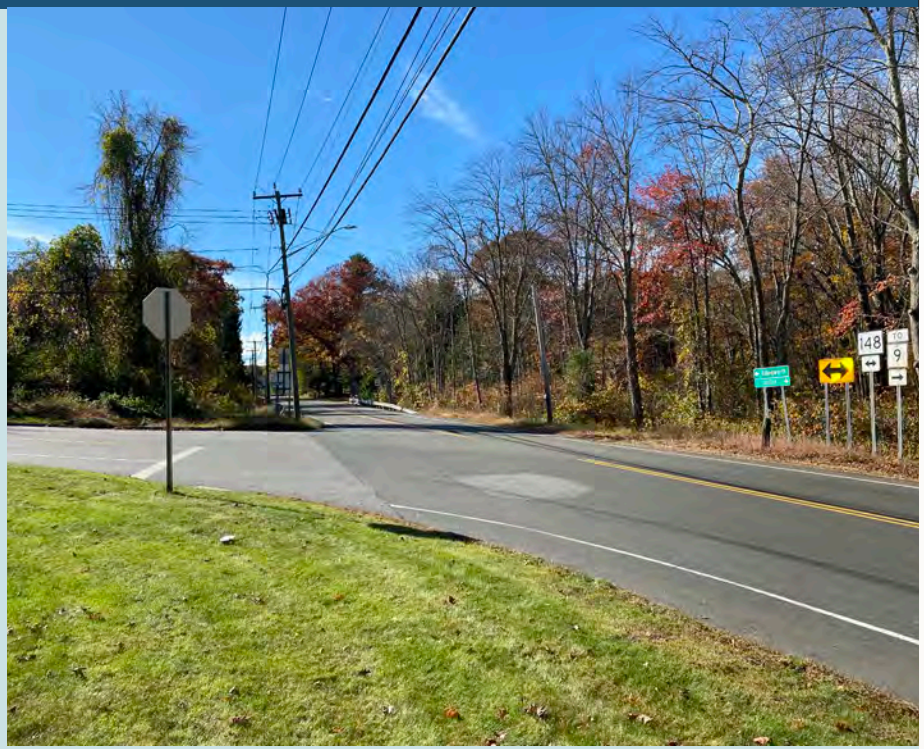
Town Representatives: Lauren Gister (First Selectman), Robert Monday (Police Department), John Divis (Public Works Department), Geoffrey Jacobson (Engineering - Nathan L. Jacobson & Associates)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Pedestrian Injury and Fatal Crash Totals, 2015-2019: 3

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 54



Intersection of CT-148 and CT-145. Source: VN Engineers

Overview

Chester is a small rural town in Middlesex County bordered by Haddam to the north, East Haddam and Lyme to the east, Deep River to the south, and Killingworth to the west. The Town's main thoroughfares are CT-9, CT-82, CT-145, CT-148, and CT-154.

Chester Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	1	0	0	1
Suspected Serious Injury (A)	3	0	0	0	0
Suspected Minor Injury (B)	5	5	6	4	8
Possible Injury (C)	5	1	5	8	2
Total Injury Crashes	13	7	11	12	11

Town's Input

Fatal Crashes from 2015-2019

- **CT-145 (Winthrop Road) and CT-148 (West Main Street)** - Dark-not lighted, roadway departure fatal crash at the intersection.
- **Cedar Lake Road** - Wet, roadway departure fatal crash.

CT-145 (Winthrop Road) and CT-148 (West Main Street)
This is a T-intersection with stop control on CT-145 (Winthrop Road) and CT-148 (West Main Street) operating under free flow conditions. At the northbound CT-145 (Winthrop Road) stop-controlled approach, the sight distance is limited looking west onto CT-148 (West Main Street). Crashes at this intersection were attributed to dark conditions and motorists not stopping at the northbound CT-145 (Winthrop Road) stop sign. In addition, speeding on CT-148 (West Main Street) has contributed to crashes and near misses.

CT-154 (Middlesex Avenue) near Goose Hill Road/Parkers Point Road
The CT-154 (Middlesex Avenue) corridor near Goose Hill Road and Parkers Point Road has had a cluster of crashes. Sight distance from Goose Hill Road and Parkers Point Road looking north onto CT-154 (Middlesex Avenue) is limited. The posted speed limit on CT-154 (Middlesex Avenue) is 40 mph in the vicinity of Goose Hill Road and Parkers Point Road, though the speed limit increases to 50 mph to the north. In general, speeding on CT-154 (Middlesex Avenue) is a concern.

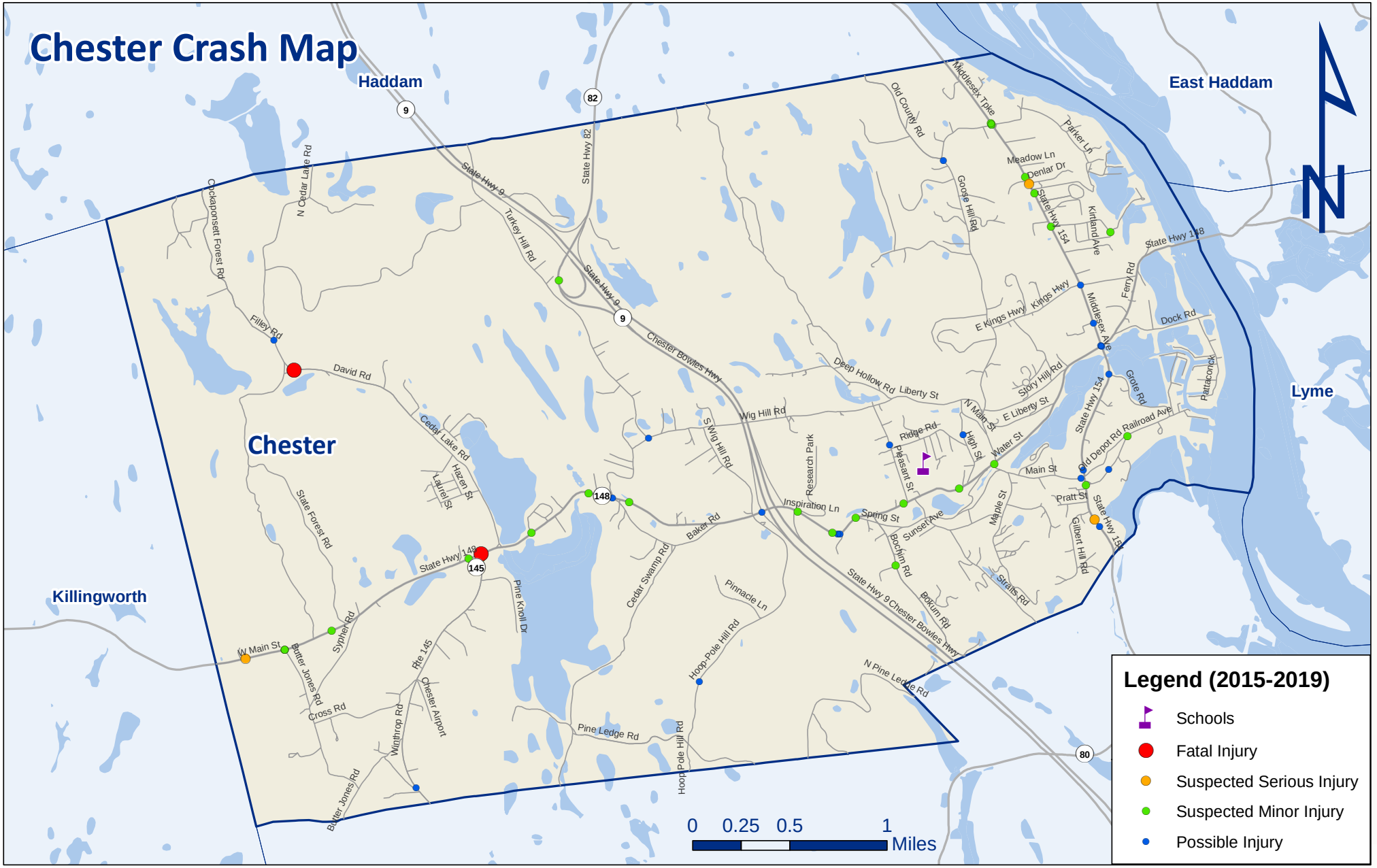
CT-154 (Middlesex Avenue) and Old Depot Road/Main Street
The CT-154 (Middlesex Avenue) intersection with Old Depot Road and Main Street is a skewed, four-way intersection, with stop control at both Old Depot Road and Main Street. This intersection has had high traffic volumes on CT-154 (Middlesex Avenue). This intersection has narrow cross sections and has had a high frequency of crashes.

CT-148 (Water Street/West Main Street) at North Main Street/Main Street
The CT-148 (Water Street/West Main Street) intersection at North Main Street and Main Street is a wide, skewed, offset, four-way stop-controlled intersection in the town center. As a result of the skewed and offset characteristics, there are sight line concerns. At this location, Main Street is currently undergoing roadway, sidewalk, and lighting improvements.

Pedestrians and Bicyclists
The Town discussed sidewalk connectivity issues, particularly along CT-148 (Water Street/Ferry Road) between the town center and the Connecticut River. The town, which has avid numbers of bicyclists, has concerns with bicyclists following the rules of the road. The Watch for Me CT campaign was discussed as a potential education resource, to help promote a message of responsibility for drivers, pedestrians, and bicyclists to share the road safely.

Centerline Rumble Strips and Horizontal Curve Signs
The State of Connecticut installed centerline rumble strips on CT-145 (Winthrop Road/Cedar Lake Road). In addition, the State installed horizontal curve warning signage along Cedar Lake Road.

CT-148 and CT-145. Source: VN Engineers


Chester Crash Map
Haddam
East Haddam
Lyme
Chester
Killingworth
Legend (2015-2019)
Schools
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0 0.25 0.5 1
Miles
State Hwy 9
Chester Bowles Hwy
Middlesex Tpke
Old County Rd
Goose Hill Rd
Meadow Ln
Denlar Dr
Parker Ln
Kinland Ave
State Hwy 154
State Hwy 148
Ferry Rd
Kings Hwy
E Kings Hwy
Middlesex Ave
Dock Rd
Pattaconck
Grote Rd
Old Depot Rd
Railroad Ave
Spory Hill Rd
Liberty St
E Liberty St
N Main St
High St
Water St
Main St
Pratt St
Ridge Rd
Pleasant St
Maple St
Spring St
Sunset Ave
Bochlin Rd
Gilbert Hill Rd
Straits Rd
Bokum Rd
Inspiration Ln
Research Park
Wig Hill Rd
S Wig Hill Rd
Deep Hollow Rd
Turkey Hill Rd
N Cedar Lake Rd
Cockaponsett Forest Rd
Filley Rd
David Rd
Cedar Lake Rd
Hazen St
Laurel St
State Forest Rd
State Hwy 148
Baker Rd
Cedar Swamp Rd
Pine Knoll Dr
Pinnacle Ln
Hoop Pole Hill Rd
N Pine Ledge Rd
Pine Ledge Rd
Chester Airport
Rte 145
Withdrop Rd
Butter Jones Rd
Cross Rd
Sypher Rd
W Main St
82
9
148
145
80

Field Site Inventory

CT-145 (Winthrop Road) and CT-148 (West Main Street)

This is an intersection of two state roads, with westbound CT-148 (West Main Street) leading to Killingworth and eastbound CT-148 (West Main Street) leading to Camp Hazen YMCA just down the road, as well as to CT-9 (Chester Bowles Highway) and downtown Chester. CT-148 (West Main Street) has one 11-foot travel lane in each direction, with shoulders ranging between two and four feet. The posted speed limit is 40 mph west of CT-145 (Winthrop Road) and 30 mph east of CT-145 (Winthrop Road). The vertical and horizontal curvature on CT-148 (West Main Street) is minimal west of CT-145 (Winthrop Road) and while the vertical curvature is minimal, there is a reverse curve just east of CT-145 (Winthrop Road).

CT-145 (Winthrop Road) leads south to Chester Airport and CT-80 (Winthrop Road). This corridor has one 11-foot travel lane in each direction, with shoulders ranging between three and four feet. The intersection of CT-145 (Winthrop Road) and CT-148 (West Main Street) is stop-controlled along the CT-145 (Winthrop Road) approach and free flowing along the CT-148 (West Main Street) approaches. The posted speed limit on CT-145 (Winthrop Road) is 40 mph. As northbound CT-145 (Winthrop Road) approaches CT-148 (West Main Street), there is minimal horizontal curvature, though there is moderate downward grade.

Recommendations:

- Consider replacing the stop sign with an oversized stop sign.
- Consider repainting pavement markings.
- Consider replacing the existing signs with MUTCD-compliant retroreflective signing.

CT-148 (West Main Street) at CT-145 (Winthrop Road). Source: VN Engineers

CT-145 (Winthrop Road) stop approach at CT-148 (West Main Street). Source: VN Engineers

Field Site Inventory

CT-154 (Middlesex Avenue) from Goose Hill Road/Parkers Point Road to Castle View Drive

The CT-154 (Middlesex Avenue) corridor between Goose Hill Road/ Parkers Point Road and Castle View Drive has a single 11-foot travel lane and 2 to 4-foot shoulders in each direction. CT-154 (Middlesex Avenue) south of Castle View Drive leads to CT-148 (Water Street/ Ferry Road), while CT-154 (Middlesex Avenue) north of Goose Hill Road/Parkers Point Road leads to CT-82 (Bridge Road) and Haddam. There are intersection warning signs in advance of the CT-154 (Middlesex Avenue) intersection with Goose Hill Road/Parkers Point Road and limited visibility of the Goose Hill approach along CT-154 (Middlesex Avenue) southbound.

The posted speed limit on CT-154 (Middlesex Avenue) is reduced to 40 mph travelling southbound at Goose Hill Road/Parkers Point Road and there is minimal horizontal or vertical curvature. The segment of CT-154 (Middlesex Avenue) between Goose Hill Road/Parkers Point Road and Castle View Drive has free-flowing traffic, with stop control on only the local roads at six locations.

Recommendations:

- Consider the addition of flashing beacons to the intersection warning signs at Goose Hill Road/Parkers Point Road.
- Consider clearing vegetation along CT-154 (Middlesex Avenue) southbound in advance of the intersection with Goose Hill Road/Parkers Point Road to improve visibility both along CT-154 (Middlesex Avenue) southbound and Goose Hill Road looking north.
- Consider the installation of dynamic speed feedback signs.
- Consider implementation of high visibility enforcement.

Goose Hill Road at CT-154 (Middlesex Avenue). Source: VN Engineers


CT-145 (Middlesex Avenue) intersection warning signage. Source: VN Engineers

Chester Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-145 (Winthrop Rd) and CT-148 (West Main St)	Replace signage	Consider replacing the existing signs with MUTCD-compliant retroreflective signing	Low
		Consider replacing the stop sign with an oversized stop sign	Low
	Pavement markings condition	Consider repainting pavement markings	Low
CT-154 (Middlesex Ave) from Goose Hill Rd/Parkers Point Rd to Castle View Dr	Limited sight distance	Consider the addition of flashing beacons for intersection ahead signs	Low
		Consider vegetation management to improve visibility at Goose Hill Rd looking north and along CT-154 (Middlesex Ave) southbound	Low
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
CT-148 (Water St/Ferry Rd)	Lack of sidewalk connectivity	Consider the installation of sidewalks along CT-148 (Water St/Ferry Rd) to connect the town center and the Connecticut River	Medium-High
Townwide	Pedestrian and bicyclist safety	Consider implementing Watch for Me CT	Low-Medium

TOWN OF CLINTON

2020 Population Estimate: 12,256

Area: 16.3 square miles

Population Density: 752 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 138,444,431

Latest (2016) VMT per Capita: 11,296

Setting: Rural/Suburban

Town Representatives: Karl Kilduff (Town Manager), Vincent Demaio (Chief of Police), Joseph Flynn (Police Department), Scott Jakober (Police Department), Todd Hajek (Director of Public Works)

Data Identified High Crash Corridors: US-1 (West Main Street/East Main Street) from Knollwood Drive to Mallard Lane/Meadow Road

Data Identified High Crash Intersections: N/A

Bike and Pedestrian Injury and Fatal Crash Totals, 2015-2019: 8

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 139

CT-81 north of US-1. Source: VN Engineers

Overview

Clinton is a rural/suburban town in Middlesex County bordered by Killingworth to the north, Westbrook to the east, Madison to the west, and Long Island Sound to the south. The Town's main thoroughfares are I-95, US-1, CT-81, and CT-145.

Clinton Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	0	2	0	0
Suspected Serious Injury (A)	1	2	0	2	3
Suspected Minor Injury (B)	22	13	6	14	25
Possible Injury (C)	12	5	2	15	15
Total Injury Crashes	35	20	10	31	43

Town's Input

Fatal Crashes from 2015-2019

- **CT-81 (Killingworth Turnpike)** - Substance-impaired, front-to-front fatal crash.
- **Alden Drive** - Pedestrian fatal crash, with older driver who failed to keep in proper lane.

In addition to the two fatalities between 2015 and 2019, the Town representatives stated there was a medical-related fatal crash on US-1, as well as an additional substance-impaired fatal crash on CT-145 (Old Post Road), though this was not found in the UConn Crash Data Repository.

Capacity Concerns

The Town's most significant concerns are related to congestion and capacity issues from the major traffic generators, like the Clinton Crossing Premium Outlets, shoreline activities, and increased development. Though Interstate 95 is outside the scope of this RTSP, the Town has capacity concerns at Interstate 95 off-ramps, particularly Exit 63, which is in the vicinity of the Clinton Crossing Premium Outlets and Clinton Station of Shore Line East (Amtrak's Northeast Corridor). The Town is concerned that the Northeast Corridor and Interstate 95 create a significant barrier by limiting north-south through traffic routes and therefore, traffic is concentrated at a few underpass locations.

CT-81 (Killingworth Turnpike/High Street/Central Avenue/Hull Street)

This north-south route has Clinton Crossing Premium Outlets as a major traffic generator, located north of the Interstate 95 interchange. The Interstate 95 Exit 63 off-ramp, more so the northbound off-ramp, experiences high congestion, due to the high volumes of traffic related to the outlet mall. Traffic consistently queues onto the mainline of the interstate. In an effort to improve capacity, the State is planning to widen the northbound off-ramp from one to two lanes at Exit 63.

The Town is concerned that future development, particularly at the former Unilever and Morgan School locations, will exacerbate traffic capacity and congestion issues. Adjacent to the former Unilever property on the west side of CT-81 (Central Avenue/Hull Street) is the Clinton Station of Shore Line East, which is under reconstruction by the State. The reconstruction will affect traffic patterns on CT-81 (Central Avenue/Hull Street) and US-1 (West Main Street) to the south. RiverCOG recently conducted a corridor study for CT-81 (Killingworth Turnpike/High Street/Central Avenue/Hull Street). This study recommends possible roundabouts, corridor access management solutions, and intersection improvements, among other conclusions (https://rivercog.org/wp-content/uploads/2020/07/Route81-Final-2020-07-09-small.pdf).

US-1 (West Main Street/East Main Street)

This east-west corridor is highlighted by commercial land use and significant pedestrian traffic. There have been several pedestrian crashes along US-1. Near the Westbrook Town Line, marsh lands constrain the US-1 (East Main Street) cross section widths and limit potential roadway improvements. Sidewalk improvements along the north side of US-1 (East Main Street) between Beach Park Road and Meadow Drive are in design with the State. The Town anticipates that the sidewalk improvements will eventually extend to the Westbrook Town Line.

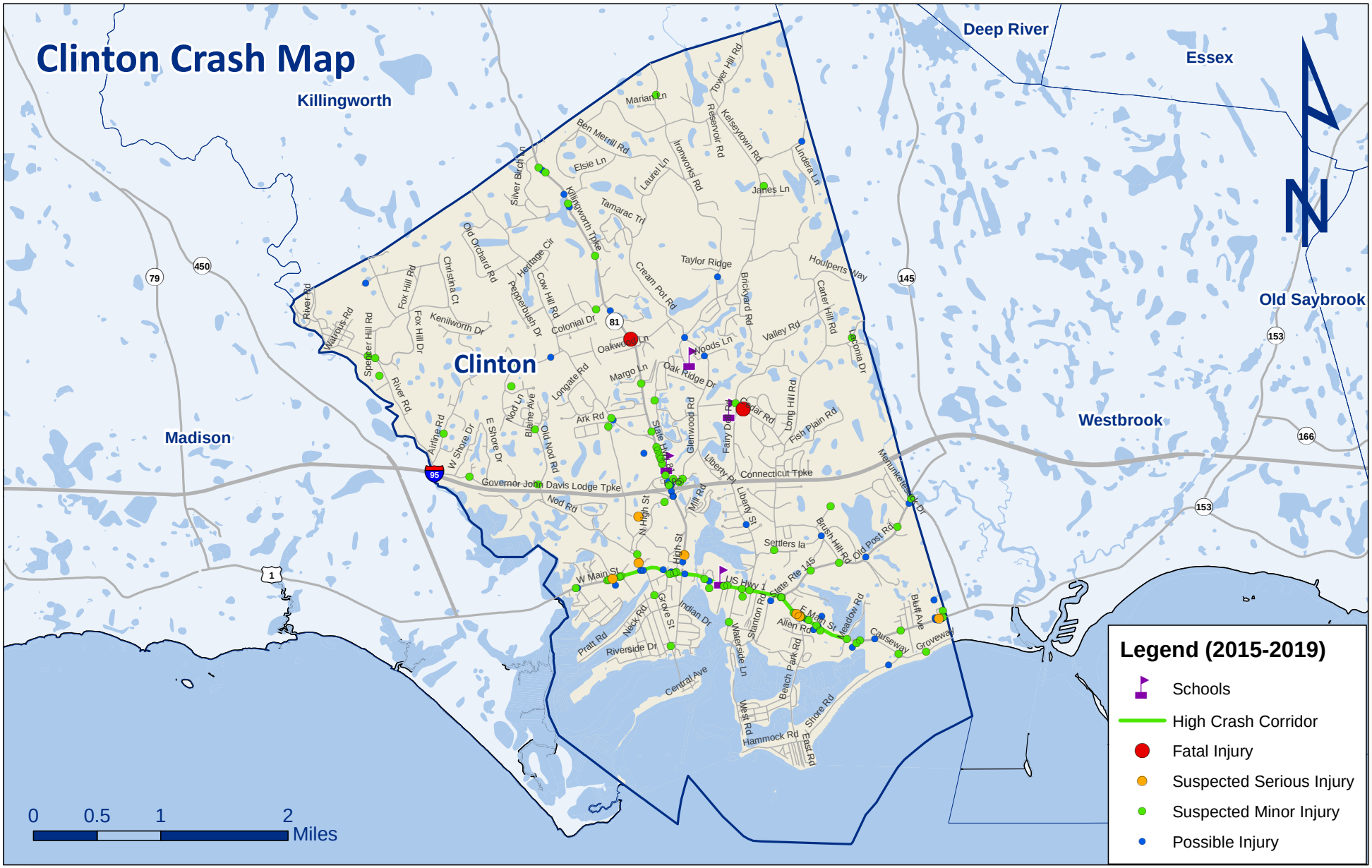
Traffic Signal Improvements

The State is installing new traffic signal equipment to improve pedestrian and traffic conditions at the following intersections:

- US-1 (East Main Street) and Meadow Road/Mallard Lane.
- US-1 (East Main Street) and CT-145 (Old Post Road).
- CT-81 (High Street) and North High Street/Interstate 95 Northbound on-ramp.

Pedestrians and Bicyclists

Pedestrian and bicyclist safety is a major concern, particularly along US-1 (East Main Street), from CT-145 (Old Post Road) to the Westbrook Town Line.


Clinton Crash Map
Killingworth
Deep River
Essex
Old Saybrook
Westbrook
Madison
Clinton
Governor John Davis Lodge Tpke
Connecticut Tpke
W Main St
US Hwy 1
State Rte 145
Legend (2015-2019)
Schools
High Crash Corridor
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0 0.5 1 2
Miles

Field Site Inventory

CT-81 (Killingworth Turnpike) and Hurd Bridge Road/Rocky Ledge Drive

CT-81 (Killingworth Turnpike) is a two-lane road, with one travel lane in each direction and two-foot wide shoulders. The posted speed limit is 45 mph, with an average travel speed of approximately 50 mph. This intersection is a four-way intersection with the Hurd Bridge Road westbound and Rocky Ledge Drive eastbound approaches under stop control. Rocky Ledge Drive does not have pavement markings, with the exception of a stop bar, while Hurd Bridge Road has a stop bar and double yellow centerline. Drivers attempting to turn onto CT-81 (Killingworth Turnpike) from Hurd Bridge Road or Rocky Ledge Drive experience poor sight distance, and in the case of Hurd Bridge Road westbound, an uphill grade to the stop sign. The intersection is also at the northern extent of a reverse curve, with curve advance warning signs and one-direction large arrows (ODLAs) present. There are the physical constraints of the guardrail in the vicinity of this intersection as well. The average speed along the CT-81 (Killingworth Turnpike) corridor at this intersection is 50 mph.

Recommendations:

- Consider the installation of centerline rumble strips along CT-81 (Killingworth Turnpike).
- Consider trimming excess vegetation on CT-81 (Killingworth Turnpike) to provide drivers with improved sightlines, particularly turning from the local roads.
- Consider the installation of intersection warning signs along CT-81 (Killingworth Turnpike) in advance of the intersection with Hurd Bridge Road and Rocky Ledge Drive.

CT-81 (Killingworth Turnpike) southbound and Hurd Bridge Road/Rocky Ledge Drive. Source: VN Engineers

Reverse curve one-direction large arrow south of the intersection. Source: VN Engineers

Field Site Inventory

CT-81 (Hull Street) from Central Avenue to US-1 (West Main Street)

CT-81 (Hull Street) is a two-lane road, with one travel lane in each direction and shoulders varying from one to three feet wide. There is no posted speed limit between Central Avenue to US-1 (West Main Street), though there are 15 mph advisory placards on the advance turn warning signs. The corridor of CT-81 (Hull Street/Central Avenue/ High Street) forms a reverse 90° curve and a T-intersection at CT-81 (Hull Street) and Central Avenue. At this location, Central Avenue continues west, while CT-81 (Hull Street) hooks south towards US-1 (West Main Street). At this curve, there is a pedestrian crossing across CT-81 (Hull Street). Further south on CT-81 (Hull Street), there is a low bridge (Bridge No. 01136), which obstructs sightlines between US-1 (West Main Street) and the reverse curve. There are sidewalks present on both sides of the street throughout the corridor, with multiple curb cuts for homes and businesses. Traffic in this area is heavy. Additionally, the Clinton Train Station of Shore Line East is within the corridor, which creates added traffic.

Signage along the reverse curve consists of two ODLAs, and turn left and right signs, both with 15 mph advisory placards. The pedestrian crossing has signage at the crosswalk, in advance south of the bridge, and in advance north of the reverse curve. Clearance signs of 11′-5″ are posted on CT-81 (Hull Street), in advance of the bridge. Lastly, there is a faded slippery when wet sign on CT-81 (Hull Street) northbound.

Recommendations:

- Consider replacing the turn arrow warning signs with reverse turn right side road left up and right down signs.
- Consider replacing the slippery when wet sign.
- Consider relocating the turn right sign south of the bridge.
- Consider replacing signs with MUTCD-compliant retroreflective signing.
- Consider high friction surface treatment on CT-81 (Hull Street).

CT-81 (Hull Street) and Central Avenue. Source: VN Engineers

Advance turn right warning sign with speed placard and advance pedestrian crossing signage. Source: VN Engineers

Clinton Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-81 (Killingworth Tpke) and Hurd Bridge Rd/Rocky Ledge Dr	Roadway curvature and front-to-front fatality	Consider the installation of centerline rumble strips along CT-81 (Killingworth Tpke)	Low
	Limited sight distance	Consider trimming excess vegetation along CT-81 (Killingworth Tpke) to provide drivers with improved sightlines, particularly turning from the local roads	Low
	Missing signage	Consider installing intersection warning signs along CT-81 (Killingworth Tpke) in advance of the intersection with Hurd Bridge Rd and Rocky Ledge Dr	Low
CT-81 (Hull St) from Central Ave to US-1 (West Main St)	Replace and relocate signage	Consider replacing the turn arrow warning signs with Reverse Turn Right Side Road Left Up and Reverse Turn Right Side Road Right Down signs	Low
		Consider high friction surface treatment	Low-Medium
		Consider replacing the slippery when wet sign	Low
		Consider relocating the Turn Right advance warning sign south of the bridge	Low
		Consider replacing the existing signs with MUTCD-compliant retroreflective signing, particularly at the pedestrian crossing	Low
US-1 (East Main St)	Pedestrian safety	Consider installing sidewalks along US-1 (East Main St) to improve pedestrian connectivity east of CT-145 (Old Post Rd) to the Westbrook Town Line	Medium-High
CT-81 (High St) and North High Street	Off-ramp congestion	In addition to CTDOT expansion to two lanes at the Interstate 95 Northbound Exit 63 off-ramp, consider improving signal coordination between the signal at the end of the off-ramp and the signal at the CT-81 (High St) and North High St intersection	Low

TOWN OF CROMWELL

2020 Population Estimate: 14,684

Area: 12.4 square miles

Population Density: 1,184 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 280,581,833

Latest (2016) VMT per Capita: 19,108

Setting: Rural/Suburban

Town Representatives: Denise LaMontagne (Chief of Police), Jon Harriman (Town Engineer), Anthony Salvatore (Town Manager), Louis Spina, (Director of Public Works), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: CT-372 (Berlin Road/West Street) from Agawam Drive to CT-3 (Shunpike Road); CT-3 (Shunpike Road) from CT-524 (Berlin Road) to Cromwell Hills Drive

Data Identified High Crash Intersections: CT-372 (Berlin Road) and I-91 northbound on- and off-ramps; CT-372 (Berlin Road) and CT-217 (East Street)/Coles Road; CT-372 (West Street) and CT-524 (Berlin Road)/ Cromwell Hills Drive; CT-372 (West Street) and CT-3 (Shunpike Road); CT-372 (West Street) and CT-9 (Chester Bowles Highway) Southbound On- and Off-Ramps; CT-372 (West Street) and CT-9 (Chester Bowles Highway) northbound on- and off-ramps

Bike and Pedestrian Injury and Fatal Crashes, 2015-2019: 34

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 380

Court Street and Woodside Road. Source: VN Engineers

Overview

Cromwell is a rural/suburban town in Middlesex County, located in the middle of the state. It is bordered by Rocky Hill to the north, Glastonbury and Portland to the east, Berlin to the west, and Middletown to the south. The Town of Cromwell's main thoroughfares are I-91, CT-3, CT-9, CT-99, CT-372, and CT-524.

Cromwell Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	0	0	0	1
Suspected Serious Injury (A)	4	4	8	4	1
Suspected Minor Injury (B)	33	24	32	29	22
Possible Injury (C)	53	44	60	30	31
Total Injury Crashes	90	72	100	63	55

Town's Input

Fatal Crashes from 2015-2019

- **CT-99 (Main St)** - Substance-impaired, fatal motorcycle crash.

CT-99 (Main Street) from CT-372 (West Street) to Iron Gate Lane/ Nooks Hill Road

This north-south route has a wide cross section, with one lane in the southbound direction and two lanes in the northbound direction, which tapers to one lane just south of Iron Gate Lane. The Town is concerned that the wide cross section encourages speeding. The State is going to install enhanced signage and chevron curve signage along the horizontal curvature throughout this corridor. This segment has a cluster of front-to-rear crashes and is a possible road diet candidate.

CT-99 (Main Street) from Evergreen Road to Court Street/Eastwood Road

This north-south corridor is a denser residential area, with a cluster of crashes. The Town noted that speeding is a concern along this segment.

CT-372 (West Street) and CT-9 (Charles Bowles Highway) Southbound Exit 19 Off-Ramp

This is a four-way signalized intersection, with high traffic volumes and frequent crashes. The CT-9 (Chester Bowles Highway) southbound Exit 19 off-ramp has a through/left-turn lane and an exclusive right-turn lane. Traffic turning right at the end of the ramp use CT-3 (Shunpike Road) with frequency. As a result, the Town stated that access to CT-3 (Shunpike Road) needs to be improved by widening the CT-9 (Charles Bowles Highway) southbound Exit 19 off-ramp to provide increased right-turn capacity. The Town also noted that this intersection is very congested during peak periods and there are a high number of crashes.

CT-3 (Shunpike Road) from CT-372 (West Street) to the Cromwell-Middletown Town Line

The CT-3 (Shunpike Road) corridor from CT-372 (West Street) to the Cromwell-Middletown Town Line is a high density commercial area with numerous curb cuts and a high frequency of crashes. Along the southbound direction of CT-3 (Shunpike Road), the number of lanes is reduced from two to one, while in the northbound direction, the number of lanes is increased from one lane to four lanes at the intersection with CT-372 (West Street). There are limited sidewalks provided along this corridor and midblock left-turn pockets to provide access to commercial driveways.

Sebethe Drive

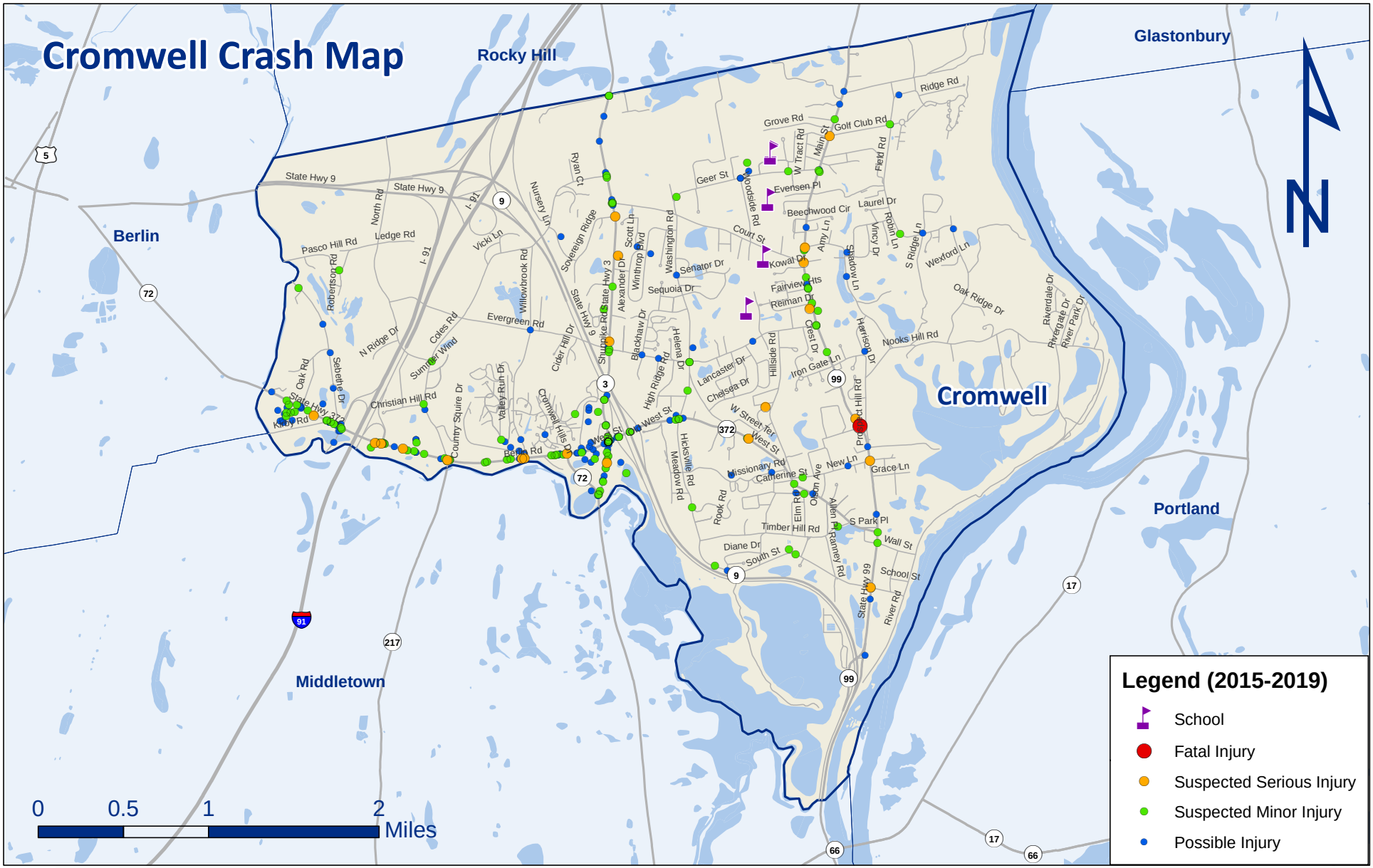
Sebethe Drive is a one-mile cul-de-sac with various commercial and recreational uses. The length of the cul-de-sac road is a concern for emergency response.

Evergreen Road

The Town stated there is speeding along the east-west corridor of Evergreen Road. As a result, police will increase enforcement along this corridor.

Pedestrians and Bicyclists

CT-372 (West Street/Berlin Road) from CT-3 (Shunpike Road) to the Cromwell-Berlin Town Line has intermittent sidewalks. Where sidewalks are not available, pedestrians walk in the shoulder or grass adjacent to the roadway. The Town would like to close the sidewalk gaps to improve pedestrian mobility for this active corridor, which connects residential and commercial areas. The Community Connectivity Grant Program (CCGP) awarded funding for sidewalks at the north end of CT-99 (Main Street) to connect to the various schools, particularly Cromwell Middle School and Woodside Intermediate School. In addition to this funding, the Planning and Zoning Commission continues to seek funding for additional sidewalks. Additional sidewalks have been added along Willowbrook Road, as part of a roadway improvement project using Surface Transportation Program (STP) funding. The Town has also used Local Transportation Capital Improvement Program (LOTCIP) funding to widen Coles Road to accommodate bicycle travel.


Cromwell Crash Map
Rocky Hill
Glastonbury
Berlin
Cromwell
Portland
Middletown
Legend (2015-2019)
School
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0
0.5
1
2
Miles

Field Site Inventory

Court Street and Woodside Road/Orchard Road

This is a four-way intersection through a residential area, with one travel lane in all directions and stop control on Woodside Road and Orchard Road. Court Street maintains free flow operations in the east-west direction. There was minimal congestion or conflicts noted, with the exception the arrival and dismissal times at the nearby Woodside Intermediate School on Woodside Drive and Edna C. Stevens Elementary School, just east of the intersection on Court Street. As a result, this intersection does not meet the four-way stop warrant. There is a crosswalk on the eastern leg of the intersection, connecting the sidewalk on the south side of Court Street to the sidewalk on the east side of Woodside Road. There are no edge lines on any of the nearby roads, though Woodside Road and Court Street do have double yellow centerlines.

Recommendations:

- If right-of-way allows for needed space, consider the addition of an exclusive left-turn lane along Woodside Road southbound, in advance of the intersection with Court Street and Orchard Road.
- Consider implementing a mini roundabout to keep traffic moving along all approaches.
- Consider raising the Court Street crosswalk.
- Consider striping edge lines for all approaches.

Court Street and Woodside Road/Orchard Road. Source: VN Engineers

In-street pedestrian crosswalk sign on Court Street. Source: VN Engineers

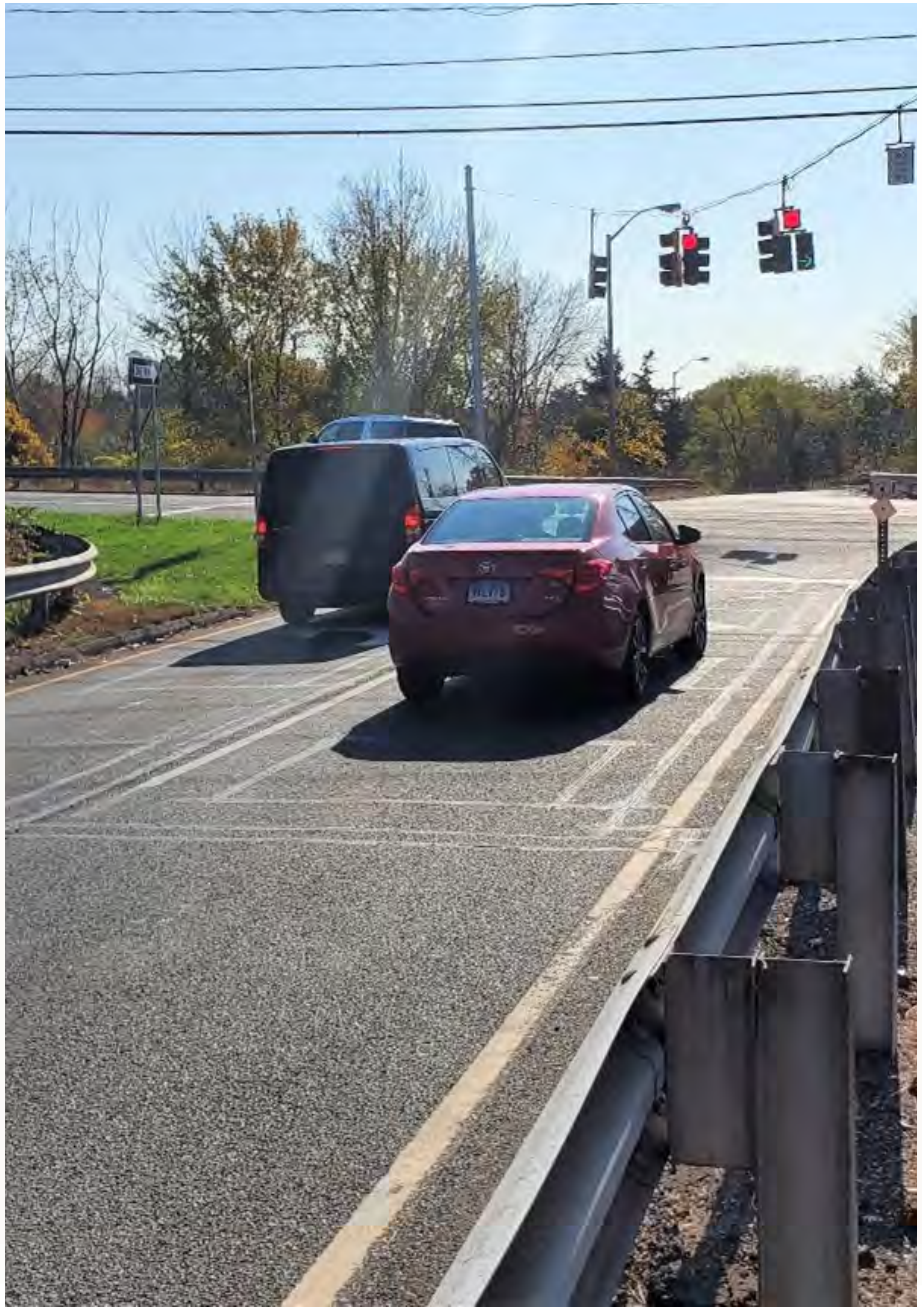
Field Site Inventory

CT-9 (Chester Bowles Highway) Exit 19 Southbound and CT-372 (West Street)

CT-9 (Chester Bowles Highway) southbound off-ramp at Exit 19 forms a signalized intersection with CT-372 (West Street) and the CT-9 (Chester Bowles Highway) southbound on-ramp. The CT-372 (West Street) westbound approach consists of a through lane and an exclusive left-turn lane providing access to the CT-9 (Chester Bowles Highway) southbound on-ramp, as well providing additional storage for the exclusive left-turn lane at the downstream signalized intersection less than 300 feet to the west at CT-3 (Shunpike Road). The CT-372 (West Street) eastbound approach consists of a through lane and a shared through/right-turn lane. The CT-9 (Chester Bowles Highway) southbound off-ramp approach consists of a shared through/right-turn lane and an exclusive left-turn lane. The intersection experiences high volumes of commuter traffic and associated congestion that is further exacerbated by the close proximity of the signalized intersection of CT-372 (West Street) and CT-3 (Shunpike Road). The short distance between the two intersections makes it very difficult to process the high volumes of CT-9 (Chester Bowles Highway) southbound off-ramp right-turn traffic to the westbound exclusive left-turn lane to CT-3 (Shunpike Road) southbound at the adjacent intersection. This situation can create gridlock during the commuter peak hours.

Recommendation:

- Consider geometric improvements to add capacity (or reduce demand) at this intersection and the adjacent intersection, to address the high volume of right turns from the CT-9 (Chester Bowles Highway) southbound off-ramp. These could include a new ramp with direct access to CT-3 (Shunpike Road) northbound to reduce traffic volumes reaching the signalized intersection and/or widening the off-ramp to provide an additional exclusive right-turn lane.



CT-9 (Chester Bowles Highway) Exit 19 southbound off-ramp and CT-372 (West Street). Source: VN Engineers

Cromwell Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
Court St and Woodside Rd/Orchard Rd	Intersection crashes	If right-of-way allows for needed space, consider the addition of an exclusive left-turn lane along Woodside Rd southbound, in advance of the intersection with Court St and Orchard Rd	Medium-High
		Consider implementing a mini roundabout to keep traffic moving along all approaches	Medium-High
		Consider raising the Court St crosswalk	Low-Medium
		Consider striping edge lines for all approaches	Low
CT-9 (Chester Bowles Hwy) Exit 19 Southbound and CT-372 (West St)	Crashes related to congestion and capacity limitations	Consider a new ramp with direct access to CT-3 (Shunpike Rd) northbound to reduce traffic volumes reaching the signalized intersection	High
		Consider widening the off-ramp to provide an additional exclusive right-turn lane	High
CT-99 (Main St) from CT-372 (West St) to Iron Gate Ln/Nooks Hill Rd	Front-to-rear crashes	Consider a road diet	Low-Medium
Townwide	Speeding, particularly on CT-99 (Main St) from Evergreen Rd to Court St/Eastwood Rd and Evergreen Rd	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
	Pedestrian safety	Consider completing intermittent sections of sidewalk, particularly along CT-372 (West St/Berlin Rd) from CT-3 (Shunpike Rd) to the Cromwell-Berlin Town Line	Medium-High

TOWN OF DEEP RIVER

2020 Population Estimate: 4,249

Area: 13.6 square miles

Population Density: 312 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 50,217,372

Latest (2016) VMT per Capita: 11,819

Setting: Rural

Town and Regional Representatives: Angus McDonald (First Selectman), Thomas Kelo (Resident State Trooper), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: CT-154 (Middlesex Avenue) from Winter Avenue to Southworth Street

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 4

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 63

CT-154 (Middlesex Avenue). Source: VN Engineers

Overview

Deep River is a small rural town in Middlesex County, bordered by Chester to the north, Lyme and Essex to the east, Killingworth to the west and Westbrook and Essex to the south. The Town's main thoroughfares are CT-9, CT-80, CT-145, CT-154, and CT-602.

Deep River Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	1	1	0	0
Suspected Serious Injury (A)	0	0	2	0	0
Suspected Minor Injury (B)	6	6	3	5	5
Possible Injury (C)	8	6	8	7	5
Total Injury Crashes	14	13	14	12	10

Town's Input

Fatal Crashes from 2015-2019

- **CT-154 (Middlesex Avenue)** - Substance-impaired, speeding, roadway departure fatal crash.
- **CT-154 (Middlesex Avenue)** - Substance-impaired, roadway departure fatal crash.

CT-80 (Winthrop Road/Elm Street)

The CT-80 (Winthrop Road/Elm Street) corridor has high truck traffic in town and the Town is ensuring that truck traffic adheres to safety regulations. Specifically, the Commercial Truck Division with the State Police Traffic Unit has conducted enforcement of through trucks to ensure that they are compliant with state and federal standards of operation. The Town would like additional information and funding opportunities to augment the through truck inspections to deter unsafe trucks from travelling through their jurisdiction.

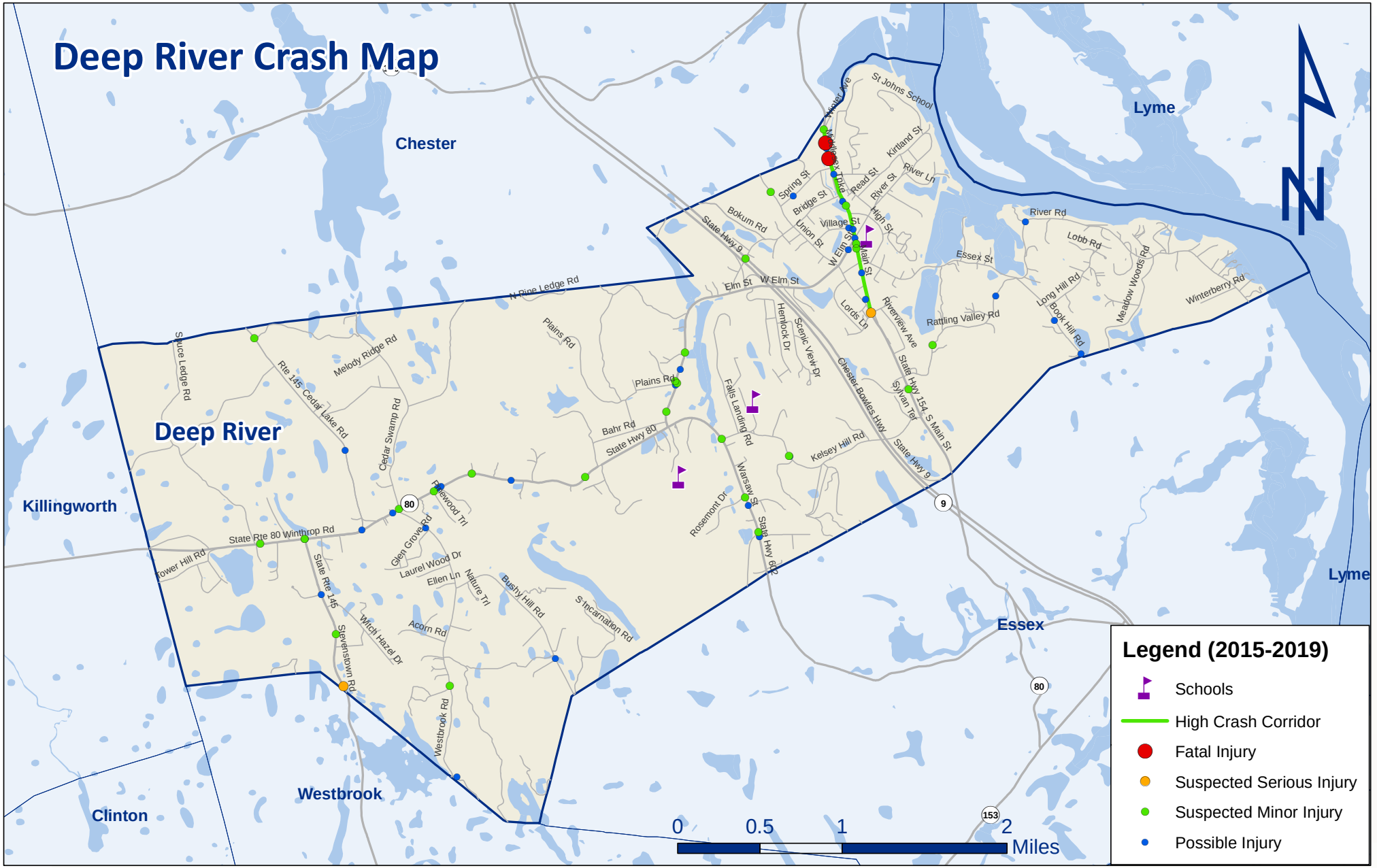
CT-80 (Winthrop Road) and Cedar Swamp Road/Westbrook Road

The offset intersection of CT-80 (Winthrop Road) and Cedar Swamp Road/ Westbrook Road experiences speeding concerns along CT-80 (Winthrop Road). Speeding and heavy truck traffic along CT-80 (Winthrop Road), coupled with vertical curvature and vegetation limiting sight distance, makes this a dangerous intersection. The Town has noted this intersection as a priority because of higher speeds on CT-80 (Winthrop Road) and a greater potential for serious crashes.

Village Center

The Town is concerned about speeding on CT-154 (Middlesex Avenue), especially in the village center, where the speed limit is posted at 30 mph. The Town also stated that there is a speed discrepancy between through traffic and residents conducting business in town. CT-154 (Middlesex Avenue) serves as the main street through the central business district, with high pedestrian traffic using the sidewalks and midblock crossings in the village center. Visibility is limited at several of these midblock crossings due to on-street parking.

CT-154 (Middlesex Avenue) and CT-80 (Elm Street)/River Street.
Source: VN Engineers


Deep River Crash Map
Chester
Lyme
Deep River
Killingworth
Westbrook
Clinton
Essex
Lyme
St Johns School
Kirtland St
River Ln
Read St
River St
Spring St
Bridge St
High St
Village St
Union St
W Elm St
Main St
Bokum Rd
State Hwy 9
River Rd
Lobb Rd
Essex St
Long Hill Rd
Meadow Woods Rd
Winterberry Rd
Book Hill Rd
Rattling Valley Rd
Riverview Ave
Lords Ln
Elm St
N Pine Ledge Rd
Plains Rd
Hemlock Dr
Scenic View Dr
Chester Bowles Hwy
State Hwy 154 S Main St
Sylvan Ter
Falls Landing Rd
Bahr Rd
State Hwy 80
Kelsey Hill Rd
Warsaw St
Rosemont Dr
State Hwy 9
Spruce Ledge Rd
Melody Ridge Rd
Rte 145 Cedar Lake Rd
Cedar Swamp Rd
Ridgewood Trl
Glen Grove Rd
Laurel Wood Dr
Ellen Ln
Nature Trl
Bushy Hill Rd
St Incarnation Rd
Witch Hazel Dr
Acorn Rd
Stevenstown Rd
Westbrook Rd
Tower Hill Rd
State Rte 80 Winthrop Rd
State Rte 145
80
9
153
0
0.5
1
2
Miles
Legend (2015-2019)
Schools
High Crash Corridor
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury

Field Site Inventory

CT-80 (Winthrop Road) and Cedar Swamp Road/Westbrook Road

This is a four-way offset intersection, with one travel lane in each direction. The CT-80 (Winthrop Road) corridor was recently repaved and new pavement markings were added. The shoulder widths along CT-80 (Winthrop Road) range from two to four feet and there are no painted shoulders along the local road approaches. Cedar Swamp Road and Westbrook Road have painted yellow centerlines and stop bars, though the paint is faded. The Westbrook Road approach is separated by a raised island between the northbound and southbound approaches. As a result of overgrown vegetation, sight distances are limited from Cedar Swamp Road in both directions along CT-80 (Winthrop Road). The posted speed limit along this section of CT-80 (Winthrop Road) is 40 mph.

Recommendations:

- Consider repainting the double yellow centerline and stop bar pavement markings at the Cedar Swamp Road and Westbrook Road approaches.
- Consider trimming excess vegetation on CT-80 (Winthrop Road) to improve visibility for Cedar Swamp Road traffic.
- Consider adding a no turn on red sign for Cedar Swamp Road southbound approach.
- Consider the installation of dynamic speed feedback signs along CT-80 (Winthrop Road).
- Consider the implementation of high visibility enforcement for speeding along CT-80 (Winthrop Road).

CT-80 (Winthrop Road) looking west. Source: VN Engineers

Cedar Swamp Road towards Westbrook Road. Source: VN Engineers

Field Site Inventory

CT-154 (Middlesex Avenue) – Village Center

CT-154 (Middlesex Avenue) is a two-lane road, with one travel lane in each direction and shoulders varying from three to six feet wide. There is a painted double yellow centerline and shoulder lines, with several midblock pedestrian crossings in the village center. These pedestrian crossings have MUTCD-compliant crosswalk signage and pedestrian ramps. CT-154 (Middlesex Avenue) intersects CT-80 (Elm Street) and River Street at a skewed signalized intersection in the village center. On-street parking is present on both sides of the roadway, just north of this intersection, which limits visibility at the midblock crossings. The posted speed limit along CT-154 (Middlesex Avenue) in the village center is 30 mph.

Recommendations:

- Consider restricting on-street parking within the vicinity of midblock pedestrian crossings.
- Consider the implementation of rectangular rapid flashing beacons (RRFBs) or pedestrian hybrid beacons (PHBs) in the village center.
- Consider the installation of dynamic speed feedback signs along CT-80 (Winthrop Road).
- Consider the implementation of high visibility enforcement for speeding along CT-80 (Winthrop Road).

CT-154 (Middlesex Avenue) looking north. Source: VN Engineers

CT-154 (Middlesex Avenue) on-street parking. Source: VN Engineers

Deep River Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-80 (Winthrop Rd) and Cedar Swamp Rd/Westbrook Rd	Missing pavement markings	Consider repainting double yellow centerline and stop bar pavement markings at the Cedar Swamp Rd and Westbrook Rd approaches	Low
	Limited sight distance	Consider trimming excess vegetation on CT-80 (Winthrop Rd) to improve visibility at Cedar Swamp Rd	Low
	Missing signage	Consider adding no turn on red sign for Cedar Swamp Rd southbound approach	Low
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
CT-154 (Middlesex Avenue) – Village Center	Visibility at midblock pedestrian crossings	Consider restricting on-street parking within the vicinity of midblock pedestrian crossings	Low
		Consider the installation of pedestrian hybrid beacons in the village center	Medium
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
CT-80 (Winthrop Rd)	Heavy truck traffic through pedestrianized area of village center	Consider expanding enforcement of through trucks to ensure compliance with state and federal standards of operations via the Commercial Truck Division with the State Police Traffic Unit	Medium-High

TOWN OF DURHAM

2020 Population Estimate: 7,483

Area: 23.6 square miles

Population Density: 317 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 60,922,011

Latest (2016) VMT per Capita: 8,141

Setting: Rural

Town Representatives: Laura Francis (First Selectman), John Jenkins (Public Works Department), Kevin Donovan (Director of Emergency Management)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 5

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 145

CT-17 (New Haven Road) at Corn Club Road. Source: VN Engineers

Overview

Durham is a rural town in Middlesex County, bordered by Middlefield and Middletown to the north, Haddam to the east, Wallingford to the west, and North Branford, Guilford, Madison, and Killingworth to the south. The Town's main thoroughfares are CT-17, CT- 68, CT-77, CT-79, CT-147, and CT-157.

Durham Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	1	2	0	0	1
Suspected Serious Injury (A)	0	0	0	0	0
Suspected Minor Injury (B)	13	12	22	18	13
Possible Injury (C)	7	14	16	10	16
Total Injury Crashes	21	28	38	28	30

Town's Input

Fatal Crashes from 2015-2019

- **CT-17 (New Haven Road**) - Substance-impaired, roadway departure, motorcycle fatal crash.
- **CT-17 (New Haven Road) near Coon Club Road** - Dark-not lighted, roadway departure fatal crash.
- **CT-79 (Madison Road)** - Dark-not lighted, roadway departure, speed-related fatal crash.
- **Maiden Lane** - Substance impaired fatal crash.

CT-157 (Skeet Club Road) and CT-68 (Wallingford Road)

This is a T-intersection, with stop control for CT-157 (Skeet Club Road) southbound, has a cluster of crashes. As a result of heavy truck traffic and high commuter traffic at the nearby industrial parks along Airline Road, the town is seeking intersection improvements. The Town is open to a potential roundabout, but needs additional funding, potentially through LOTCIP or Surface Transportation Program (STP) grants.

CT-68 (Wallingford Road)

This east-west corridor has areas of higher crash frequency. CT-68 (Wallingford Road) near Pent Road has a series of horizontal and vertical curves, with limited warning signage. There is an existing crosswalk across CT-68 (Wallingford) at Dunn Hill Road, which the Town has decided to preserve after seeking public input. Due to the 40 mph speed limit and lack of traffic control on CT-68 (Wallingford Road) at this crossing, the Town would like rectangular rapid flashing beacons (RRFBs) for pedestrian safety.

CT-17 (New Haven Road/Main Street)

This route has significant horizontal and vertical curvature, along with several dark-not lighted sections of roadway. This corridor has speeding issues and several clusters of crashes, including two fatalities. The CT-17 (New Haven Road) intersection with Parmelee Hill Road is a significantly skewed intersection, with a cluster of crashes. The downtown section of CT-17 (Main Street) has sidewalks on the east side which will be extended on the west side, though funding from the Community Connectivity Grants Program (CCGP) and LOTCIP.

CT-17 (New Haven Road/Main Street) and CT-79 (Madison Road)

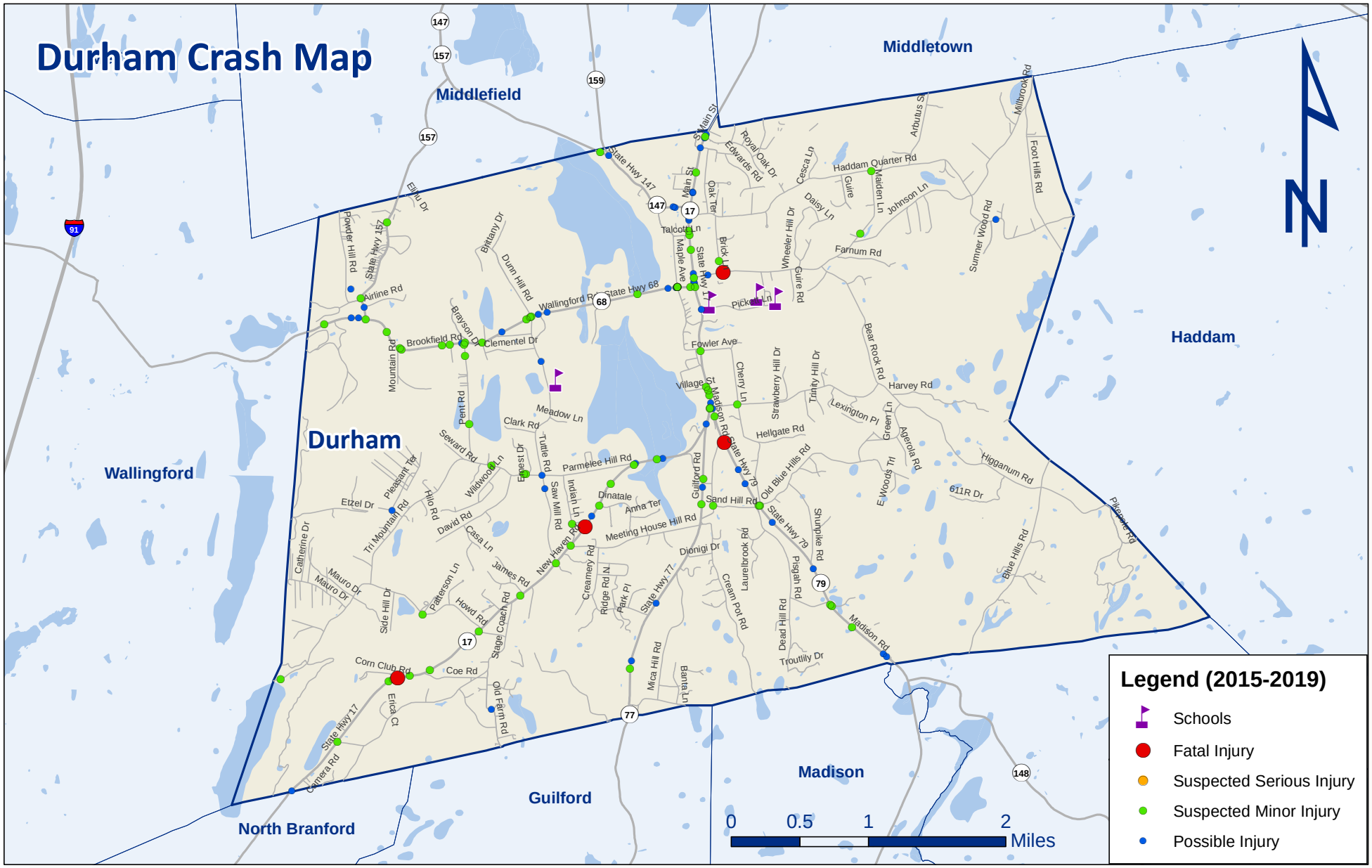
This intersection has high turning movements and high volumes of traffic, which has led to crashes. RiverCOG conducted a CT-17 (New Haven Road/ Main Street) corridor study, which included mitigation strategies for this intersection. These strategies may also include Higganum Road, based on its close proximity to the intersection of CT-17 (New Haven Road/Main Street) and CT-79 (Madison Road). These recommendations are to be reviewed and revisited.

Pedestrians and Bicyclists

The Town of Durham Board of Selectman adopted a Complete Streets Resolution on July 23, 2018 and formed a Complete Streets group in town. This local Complete Street group led and studied the potential addition of sharrows to Pickett Lane and Maiden Lane, which are in the vicinity of various school. In addition, the State plans to add sharrows on CT-17 (New Haven Road/Main Street). In an effort to improve bicycle conditions, the State intends to install bike lanes along CT-17 (New Haven Road/Main Street).

Centerline Rumble Strips

The State of Connecticut installed centerline rumble strips on CT-79 (Madison Road).


Durham Crash Map
Middletown
Middlefield
Haddam
Durham
Wallingford
Guilford
Madison
North Branford
Legend (2015-2019)
Schools
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0 0.5 1 2 Miles

Field Site Inventory

CT-17 (New Haven Road) and Parmelee Hill Road

At the intersection with Parmelee Hill Road, CT-17 (New Haven Road) is a two-lane roadway, with one travel lane in each direction and shoulders of approximately three feet in width. At this intersection, CT-17 (New Haven Road) is free-flow and has a slight horizontal curve with superelevation. Parmelee Hill Road is under stop control and has a skewed approach to CT-17 (New Haven Road) on the superelevated high side of the horizontal curve. The intersection has a large gore area where the pavement from Parmelee Hill Road meets CT-17 (New Haven Road) and this pavement has no markings. Furthermore, the stop sign and stop bar for Parmelee Hill Road are set back away from the intersection. As a result, stopped vehicles on Parmelee Hill Road must then proceed into the gore area and reach white edge line of CT-17 (New Haven Road) to complete the turn. There is no advance intersection warning on CT-17 (New Haven Road). Motorists on Parmelee Hill Road may have the sufficient sight distance, but given the horizontal curve, motorists on northbound CT-17 (New Haven Road) may not see vehicles coming out of Parmelee Hill Road. The intersection is illuminated and the posted speed limit along CT-17 (New Haven Road) is 45 mph.

Recommendations:

- Consider the installation of warning signs (Side Road Angle Right Up & Side Road Angle Left Down) on CT-17 (New Haven Road) to alert motorists of this intersection.
- Consider the installation of diagonal crosshatch markings in the gore area between the CT-17 (New Haven Road) edge line and the Parmelee Hill Road stop bar to better control the flow of traffic through this area.
- Consider moving the stop sign and stop bar on Parmelee Hill Road closer to CT-17 (New Haven Road), so that motorists at this stop sign are more visible to traffic on CT-17 (New Haven Road).

Gore Area between CT-17 (New Haven Road) and Parmelee Hill Road.
Source: VN Engineers

CT-17 (New Haven Road) looking north at Parmelee Hill Road.
Source: VN Engineers

Field Site Inventory

CT-17 (New Haven Road) and Coon Club Road

At this intersection, CT-17 (New Haven Road) is a two-lane roadway, with one travel lane in each direction and shoulder widths between two and three feet. CT-17 (New Haven Road) intersects Coon Club Road at a three-way intersection, where CT-17 (New Haven Road) is under free-flow and Coon Club Road is under stop control. Guide rails are present on both sides of the road south of Coon Club Road. North of this intersection, guide rail is only installed along northbound CT-17 (New Haven Road). Horizontal curvature is present along CT-17 (New Haven Road) south of the intersection and the horizontal curvature ends at Coon Club Road. There is downward vertical grade change traveling northbound along CT-17 (New Haven Road) at the intersection of Coon Club Road. The speed limit in this area is 45 mph. The intersection does not have any illumination. Approaching the intersection, motorists on Coon Club road have a steep descending grade.

Recommendations:

- Consider the installation of centerline rumble strips along CT-17 (New Haven Road).
- Consider the installation of shoulder rumble strips on CT-17 (New Haven Road), in the vicinity of Coon Club Road.
- Consider installation of roadway illumination for this intersection.

Horizontal curvature along CT-17 (New Haven Road) looking north.
Source: VN Engineers

Coon Club Road at CT-17 (New Haven Road). Source: VN Engineers

Durham Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-17 (New Haven Rd) and Parmelee Hill Rd	Missing signage	Consider the installation of warning signs (Side Road Angle Right Up & Side Road Angle Left Down) on CT-17 (New Haven Rd) to alert motorists of this intersection	Low
	Missing pavement markings	Consider the installation of diagonal crosshatch markings in the gore area between the CT-17 (New Haven Rd) edge line and the Parmelee Hill Rd stop bar to better control the flow of traffic through this area	Low
	Limited visibility	Consider moving the stop sign and stop bar on Parmelee Hill Rd closer to CT-17 (New Haven Rd), so that motorists at this stop sign are more visible to traffic on CT-17 (New Haven Rd)	Low
CT-17 (New Haven Rd) and Coon Club Rd	Roadway curvature	Consider the installation of centerline rumble strips along CT-17 (New Haven Rd)-State has proposed they be installed from the North Branford Town Line to 175' south of Higganum Rd	Low
		Consider the installation of shoulder rumble strips on CT-17 (New Haven Rd), in the vicinity of Coon Club Rd	Low
	Nighttime visibility	Consider installation of roadway illumination for this intersection	Medium
CT-157 (Reeds Gap Rd) and CT-68 (Wallingford Rd)	Heavy truck and commuter traffic	Consider the investigation of intersection improvements, including a roundabout, to process heavy truck traffic from industrial parks along Airline Rd and commuter traffic simultaneously	High
CT-68 (Wallingford Rd)	Missing signage	Consider the installation of warning signs in the vicinity of Pent Rd, where there is a series of horizontal and vertical curves	Low
	Unsigned pedestrian crossing	Consider the installation of MUTCD compliant signage at the pedestrian crossings at the intersection of CT-68 (Wallingford Rd) with Dunn Hill Rd and Turtle Rd	Low

TOWN OF EAST HADDAM

2020 Population Estimate: 9,169

Area: 54.3 square miles

Population Density: 169 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 55,134,265

Latest (2016) VMT per Capita: 6,013

Setting: Rural

Town and Regional Representatives: Robert Smith (First Selectman), Elizabeth Lunt (Public Works Director), Jim Ventres (Land Use Administrator), Ian Hawes (Resident State Trooper)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 2

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 160

CT-149 (East Haddam Moodus Road) at CT-151 (Plains Road/Town Street) (Source: VN Engineers)

Overview

East Haddam is a town in Middlesex County, bordered by East Hampton and Colchester to the north, Salem and Colchester to the east, Haddam to the west, and Chester and Lyme to the south. The Town's main thoroughfares are CT-82, CT-149, CT-151, CT-156, CT-431, and CT-434.

East Haddam Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	2	3	1	0	0
Suspected Serious Injury (A)	0	6	1	0	0
Suspected Minor Injury (B)	13	13	25	16	14
Possible Injury (C)	15	24	6	12	9
Total Injury Crashes	30	46	33	28	23

Town's Input

Fatal Crashes from 2015-2019

- **North Moodus Road** - Speed-related fatal crash.
- **CT-149 (East Haddam Moodus Road) west of CT-151 (Plains Road/Town Street)** - Speed-related, motorcycle, fatal crash.
- **CT-149 (East Haddam Moodus Road) east of CT-151 (Plains Road/Town Street)** - Motorcycle fatal crash.
- **East Haddam Colchester Turnpike at Launching Area Road** - Intersection fatal crash.
- **CT-434 (Hopyard Road)** - Young driver, motorcycle fatal crash.
- **CT-82 (Norwich Salem Road)** - Roadway departure fatal crash.

CT-82 (Norwich Road) and Boardman Road

This is a skewed intersection through a horizontal curve, with stop control at the Boardman Road southbound approach. This intersection has a higher frequency of front-to-rear crashes. There is limited sight distance due to the horizontal curvature and physical constraint from the nearby embankment. Chevron curve signs and intersection ahead signs are installed along CT-82 (Norwich Road).

CT-149 (Falls Road) and Falls Bashan Road

This is a skewed intersection through a horizontal curve, with stop control at the Falls Bashan Road southbound approach. This intersection has a cluster of crashes, particularly roadway departure crashes. The posted speed limit on CT-149 (Falls Road) is 30 mph, with an advisory speed of 20 mph through the horizontal and vertical curvature. However, speeding is still an issue.

CT-149 (Main Street) and Landing Hill Road

The CT-149 (Main Street) intersection with Landing Hill Road has several front-to-rear crashes, due to the limited sight distance along the horizontal curvature at the intersection.

CT-434 (Hopyard Road)

The corridor has a series of crashes through the horizontal and vertical curvature, adjacent to the Fox Hopyard Golf Club.

Pedestrians and Bicyclists

The Goodspeed Opera House is a pedestrian generator for the Town of East Haddam. Bicyclists are also frequent in town, especially along CT-82 (Town Street/Norwich Road/Main Street/Bridge Road), CT-434 (Mount Parnassus Road/Hopyard Road), CT-151 (Plains Road/Town Street), and Tater Hill Road.

Lake Hayward

The high frequency of crashes on the network of roadways around Lake Hayward could be a result of several unpaved roadways. The Town would like to determine if any crashes were due to inclement weather during the winter months.

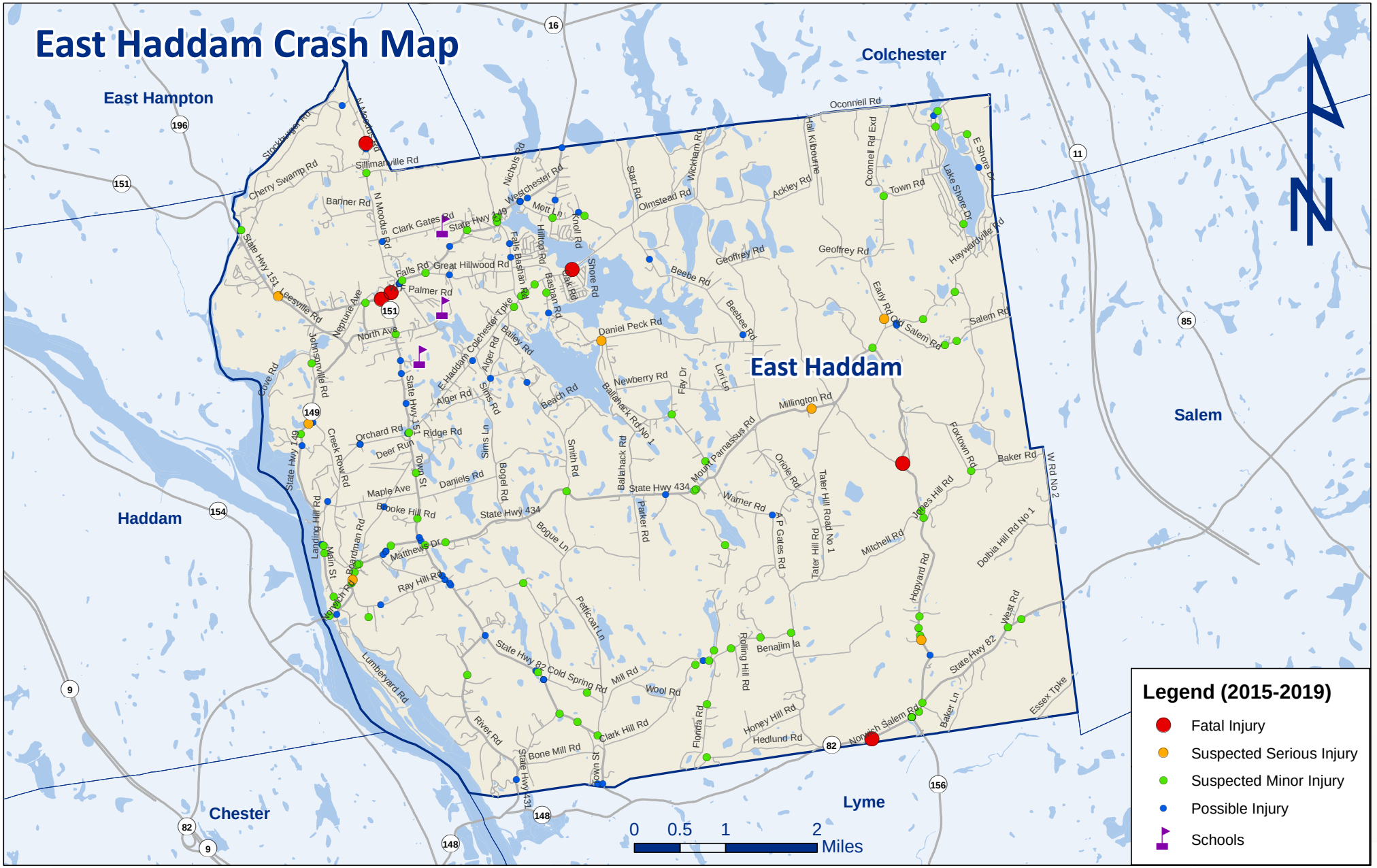
Town Strategies

Centerline rumble strips have not been applied in town due to public disapproval. Curve warning signs have been installed, though there is concern that some roads are oversigned. The Town has grant-funded DUI spot checks and two dynamic speed feedback signs which are utilized by state troopers. Pedestrian crosswalks and pedestrian warning signs have been installed at various locations by the State.

Motorcycle Safety

East Haddam had three motorcycle fatal crashes in the study period, two of which were near the intersection of CT-151 (Plains Road/Town Street) and CT-149 (East Haddam Moodus Road). Due to the high number of motorcycle riders passing through East Haddam travelling to the shore and other popular destinations, as well as the high number of motorcycle crashes, the Town could consider investigating motorcycle safety awareness and outreach. In addition, the Town could also review the motorcycle emphasis area strategies on page 35.

CT-149 (Falls Road). Source: VN Engineers


East Haddam Crash Map
East Haddam
Colchester
East Hampton
Haddam
Salem
Lyme
Chester
Legend (2015-2019)
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
Schools
0 0.5 1 2
Miles
N
Oconnell Rd
Town Rd
Lake Shore Dr
Haywardville Rd
Geoffrey Rd
Ackley Rd
Olmstead Rd
Wickham Rd
Starr Rd
Nichols Rd
Westchester Rd
Mott Ln
Knoll Rd
Shore Rd
Beebe Rd
Daniel Peck Rd
Newberry Rd
Millington Rd
Foxtown Rd
Baker Rd
Salem Rd
Early Rd
Old Salem Rd
Mount Parnassus Rd
Warner Rd
Tater Hill Road No 1
Mitchell Rd
James Hill Rd
Dolbia Hill Rd No 1
Hopyard Rd
West Rd
State Hwy 82
Honey Hill Rd
Hedlund Rd
Norwich Salem Rd
Baker Ln
Essex Tpke
Rolling Hill Rd
Benajim la
Florida Rd
Clark Hill Rd
Wool Rd
Mill Rd
Cold Spring Rd
Petticoat Ln
Bone Mill Rd
State Hwy 431
Town St
River Rd
Lumberyard Rd
Ray Hill Rd
Matthews Dr
Boardman Rd
Main St
Landing Hill Rd
Brooke Hill Rd
Maple Ave
Daniels Rd
Bogue Ln
Bogel Rd
Smith Rd
Ballahack Rd
Ballahack Rd No 1
Parker Rd
Fay Dr
Lori Ln
Beach Rd
Alger Rd
Sims Ln
Bailey Rd
E Haddam Colchester Tpke
North Ave
Neptune Ave
Johnsonville Rd
Cove Rd
Leesville Rd
State Hwy 151
Falls Rd
Great Hillwood Rd
Falls Bashan Rd
Bashan Rd
Hilltop Rd
Oak Rd
Palmer Rd
Clark Gates Rd
State Hwy 149
Banner Rd
N Moodus Rd
Cherry Swamp Rd
Stockbarger Rd
Sillimanville Rd
Orchard Rd
Ridge Rd
Deer Run
Creek Row Rd
Town St
Sims Ln
State Hwy 434
A P Gates Rd
Oriole Rd
Tater Hill Rd
W Rd No 2
Hall Kilbourne
Oconnell Rd Exd
E Shore Dr
16
11
85
151
196
149
154
9
82
148
156

Field Site Inventory

CT-149 (East Haddam Moodus Road/Falls Road) from CT-151 (Town Street) to North Moodus Road/William F. Palmer Road

CT-149 (East Haddam Moodus Road/Falls Road) is a two-lane roadway, with one travel lane in each direction. The segment begins at the three-way intersection of CT-149 (East Haddam Moodus Road), which operates under free-flow, and the stop-controlled approach of CT-151 (Town Street). Horizontal and vertical curvature is present along CT-149 (East Haddam Moodus Road) and there are chevron curve signs to delineate the road. Sight distance from CT-151 (Town Street) is adequate for the posted speed of 30 mph along CT-149 (East Haddam Moodus Road). Between the intersections with CT-151 (Town Street) and North Moodus Road/William F. Palmer Road, there is limited horizontal and vertical curvature. A flashing yellow signal is provided for through traffic along CT-149 (Falls Road) and a flashing red is present for stop-controlled traffic at the North Moodus Road and William F. Palmer Road side streets. East Haddam Elementary School is located south of this corridor, off of William F. Palmer Road, and carries school-related traffic.

Recommendations:

- Consider narrowing travel lanes along CT-149 (East Haddam Moodus Road/Falls Road) to 11 feet to discourage speeding.
- Consider adding left-turn lanes at the intersection of CT-149 (Falls Road) and North Moodus Road/William F. Palmer Road.
- Consider a roundabout at the CT-149 (Falls Road) and North Moodus Road/William F. Palmer Road to slow traffic and reduce conflicts.

Horizontal and vertical curvature along CT-149 (East Haddam Moodus Road) looking west. Source: VN Engineers

Horizontal and vertical curvature along CT-149 (Falls Road) looking west. Source: VN Engineers

Field Site Inventory

CT-149 (Falls Road) and Falls Bashan Road

CT-149 (Falls Road) intersects Falls Bashan Road through a series of vertical and horizontal curvature along both approaches. CT-149 (Falls Road) has a narrow cross section with minimal shoulder and physical constraints along both edges of roadway. CT-149 (Falls Road) intersects Falls Bashan Road at a three-way intersection, where CT-149 (Falls Road) is free flowing and Falls Bashan Road is under stop control. There are advance curve warning signs with supplemental 20 mph speed advisory signs along both approaches to Falls Bashan Road and chevron curve signs through the horizontal curvature.

This skewed intersection has limited stopping sight distance for motorists coming around the blind corners with little time to anticipate Falls Bashan Road vehicles entering CT-149 (Falls Road). The sight distance is also limited for Falls Bashan Road vehicles turning onto CT-149 (Falls Road) in both directions. There is overgrown vegetation to the north of Falls Bashan Road.

Recommendations:

- Consider realigning the intersection at Falls Bashan Road to intersect CT-149 (Falls Road) at 90 degrees.
- Consider dynamic speed feedback signs to monitor speeds through the curves.
- Consider investigating an all way stop.
- Consider trimming and removing vegetation.

Horizontal and vertical curvature along CT-149 (Falls Road) looking east.
Source: VN Engineers

Horizontal and vertical curvature along CT-149 (Falls Road) looking north.
Source: VN Engineers

East Haddam Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-149 (East Haddam Moodus Rd/Falls Rd) from CT-151 (Town St) to North Moodus Rd/William F. Palmer Rd	Speeding	Consider narrowing travel lanes along CT-149 (East Haddam Moodus Rd/Falls Rd) to 11 feet to discourage speeding	Low
	High volume of left turns and traffic conflicts	Consider adding left-turn lanes at the intersection of CT-149 (Falls Rd) and North Moodus Rd/ William F. Palmer Rd, particularly for East Haddam Elementary School-related traffic	Low-Medium
		Consider a roundabout at the CT-149 (Falls Rd) and North Moodus Rd/William F. Palmer Rd to slow traffic and reduce conflicts	High
CT-149 (Falls Rd) and Falls Bashan Rd	Intersection through horizontal curvature crashes	Consider realigning the intersection at Falls Bashan Rd to intersection CT-149 (Falls Rd) at 90 degrees	High
		Consider dynamic speed feedback signs to monitor speeds through the curves	Low
		Consider investigating an all way stop	Low
		Consider trimming and removing vegetation	Low
Townwide	Speeding	Consider expanding the usage of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium

TOWN OF EAST HAMPTON

2020 Population Estimate: 13,757

Area: 35.6 square miles

Population Density: 386 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 68,468,686

Latest (2016) VMT per Capita: 4,977

Setting: Rural

Town and Regional Representatives: Dennis Woessner (Chief of Police), Matt Walsh (Director of Public Works)

Data Identified High Crash Corridors: CT-66 (West High Street/East High Street) from Old West High Street to Bear Swamp Road

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 9

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 214

CT-16 (Colchester Avenue). Source: VN Engineers

Overview

East Hampton is a rural town in Middlesex County, bordered by Glastonbury to the north, Marlborough and Colchester to the east, Portland and Middletown to the west, and Haddam and East Haddam to the south. It includes the boroughs of Cobalt, Middle Haddam, and Lake Pocotopaug. The Town's main thoroughfares are CT-16, CT-66, CT-151, CT-196, and CT-439.

East Hampton Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	1	0	0	3	0
Suspected Serious Injury (A)	3	2	5	2	3
Suspected Minor Injury (B)	25	22	26	25	17
Possible Injury (C)	18	18	11	16	16
Total Injury Crashes	47	42	42	47	36

Town's Input

Fatal Crashes from 2015-2019

- **Tartia Road** - Speed-related, roadway departure fatal crash.
- **CT-16 (Colchester Avenue)** - Young driver, speed-related, lane departure, front-to-front fatal crash.
- **CT-66 (Portland-Cobalt Road/West High Street) and CT-151 (Middle Haddam Road)/Depot Hill Road** - Substance-impaired, front-to-rear, motorcycle fatal crash.
- **CT-66 (East High Street) and Laurel Ridge** - Motorcycle and older driver, intersection fatal crash.

CT-66 (Portland-Cobalt Road/West High Street/East High Street)
This corridor has moderate levels of bicycle activity, high ADT, high through traffic volumes, and a high number of curb cuts. The Town stated that the CT-66 (West High Street/East High Street) intersection with North Main Street and Main Street has an exclusive pedestrian phase to protect pedestrians crossing at this location, particularly those at the nearby Westside Manor assisted living facility. The Town also noted that currently, there are rumble strips along the western segment of CT-66 (Portland-Cobalt Road/West High Street).

RiverCOG recently conducted a Corridor Study on Route 66 in Portland and East Hampton, which recommended improved access management, pedestrian and bicyclist improvements, and improved intersections within the village center or central business district. The Town acknowledged recommendations from the study to install Middletown Area Transit (MAT) bus pulloff areas at designated stops to alleviate congestion and queuing. The study also noted that the stop-controlled, skewed intersection of CT-66 (East High Street) and Old Marlborough Road near Edgewater Circle has limited sight distance and the Town concurred that this intersection needs to be realigned for safety.

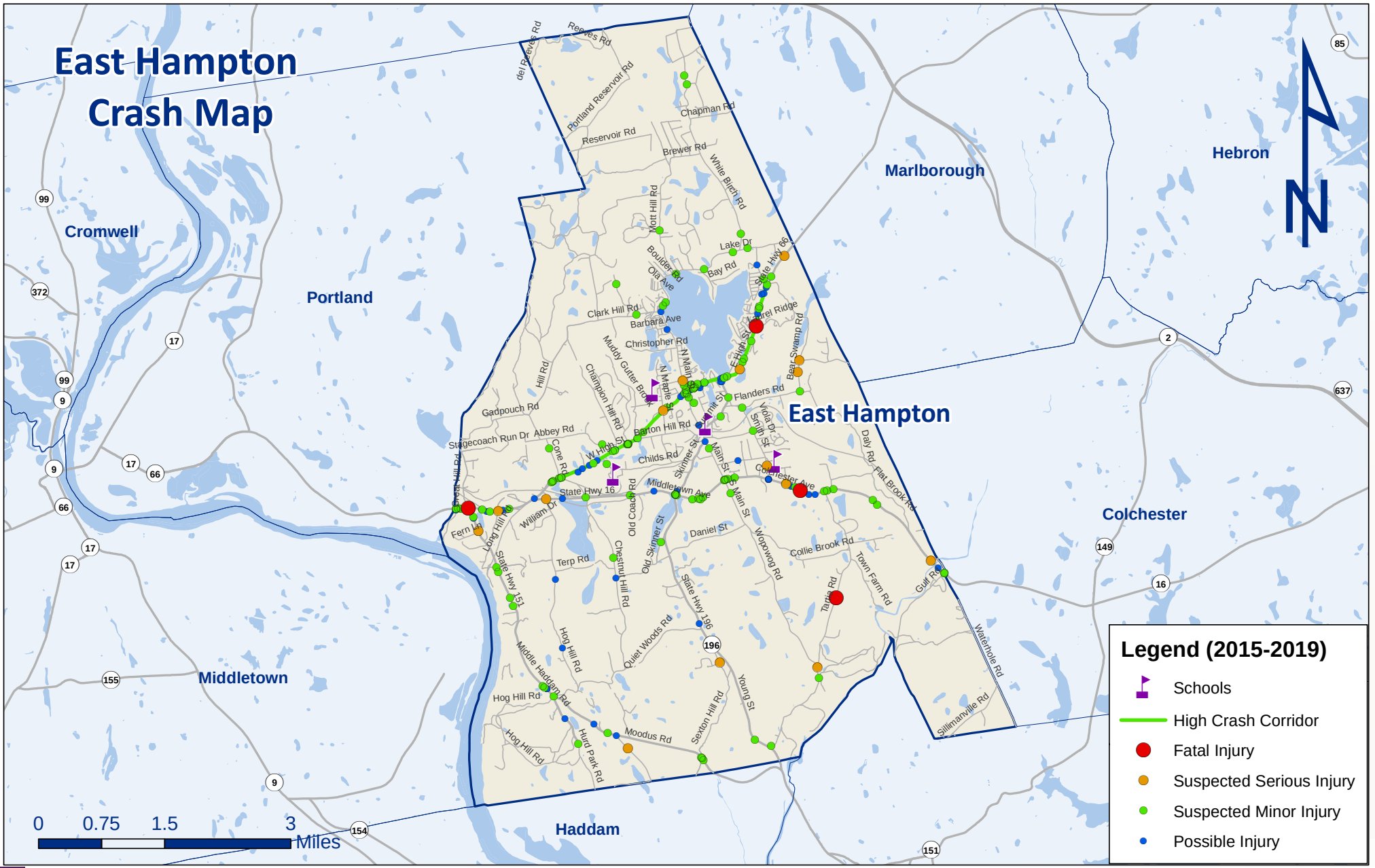
CT-66 (Portland-Cobalt Road/West High Street) and CT-151 (Middle Haddam Road)/Depot Hill Road
This four-way signalized intersection has a high number of crashes and capacity issues. Due to the narrow roadway cross section, there are no left-turn pockets along CT-66 (Portland-Cobalt Road/West High Street) and the Town discussed that this intersection has the potential to become a roundabout location in the future.

Village Center
The intersection of CT-66 (West High Street/East High Street) with North Main Street and Main Street is at the village center. The Town is concerned about speeding on CT-66 (West High Street/East High Street) and would like traffic calming to be explored on this segment, as well as North Main Street and Main Street, to provide for a safer downtown.

CT-16 (Middletown Avenue) and CT-196 (Young Street/Skinner Street)
This four-way signalized intersection is the intersection of two two-lane roadways. The Town stated that the signal is to be replaced and would also like battery backup at this intersection because of frequent power outages.

CT-16 (Colchester Avenue) and Tartia Road
This three-way, Y-intersection is stop-controlled at the northbound Tartia Road approach and free flow along CT-16 (Colchester Avenue). The Town is concerned about the limited sight distance due to the alignment and horizontal curvature along the CT-16 (Colchester Avenue) approaches. As a result of the sight distance concerns and a series of crashes, the Town would like this intersection to be realigned.

CT-151 (Middle Haddam Road/Moodus Road) and CT-439 (Hurd Park Road)/Hog Hill Road
This four-way, skewed signalized intersection has a high number of crashes. The westbound CT-151 (Moodus Road) approach has both horizontal and vertical curvature in advance of the intersection. Currently, there is an advance intersection warning sign with flashing beacons along the eastbound CT-151 (Middle Haddam Road) approach to the intersection. The Town stated that they would like the State to install new advance warning beacons on CT-151 (Middle Haddam Road) that is interconnected with the traffic control signal and a be prepared to stop sign supplemented with when flashing. The Town would also like battery backup at this intersection because of frequent power outages.


East Hampton
Crash Map
Cromwell
Portland
Middletown
Haddam
Marlborough
Hebron
Colchester
East Hampton
Reeves Rd
Portland Reservoir Rd
Reservoir Rd
Chapman Rd
Brewer Rd
White Birch Rd
Mott Hill Rd
Boulder Rd
Ola Ave
Lake Dr
Bay Rd
State Hwy 66
Clark Hill Rd
Barbara Ave
Christopher Rd
Laurel Ridge
Bear Swamp Rd
E High St
N Main St
N Maple St
Mill St
Flanders Rd
Hill Rd
Muddy Gutter Brook
Champion Hill Rd
Gadpouch Rd
Stagecoach Run Dr
Abbey Rd
Barton Hill Rd
W High St
Cone Rd
Childs Rd
Skinner St
Main St
Viola Dr
Smith St
Colchester Ave
Daly Rd
Flat Brook Rd
State Hwy 16
Middletown Ave
Old Coach Rd
Old Skinner St
Daniel St
S Main St
Woqowood Rd
Collie Brook Rd
Town Farm Rd
Gulf Rd
Tartia Rd
Waterhole Rd
Sillimanville Rd
Green Hill Rd
Fern Ln
Long Hill
William Dr
State Hwy 151
Terp Rd
Chestnut Hill Rd
State Hwy 196
Quiet Woods Rd
Middle Haddam Rd
Hog Hill Rd
Moodus Rd
Hurd Park Rd
Sexton Hill Rd
Young St
0 0.75 1.5 3 Miles
Legend (2015-2019)
Schools
High Crash Corridor
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury

Field Site Inventory

CT-151 (Middle Haddam Road/Moodus Road) and CT-439 (Hurd Park Road)/Hog Hill Road

The intersection of CT-151 (Middle Haddam Road/Moodus Road) and CT-439 (Hurd Park Road) is a three-way, signalized intersection with one travel lane in each direction from all approaches. The signalized intersection is in the middle of horizontal curvature and there are One-Direction Large Arrows directing vehicles along CT-151 (Middle Haddam Road/Moodus Road). CT-151 (Middle Haddam Road/Moodus Road) experiences a downward grade along the eastbound approach into the intersection, followed by an upward grade once through the intersection. Since this as an offset, skewed intersection, the sight distances are limited in all directions.

Along the eastbound and westbound CT-151 (Middle Haddam Road) approaches to the signalized intersection there are advanced warning signs with flashing beacons. Adjacent to this intersection is a small parking lot for Hurd State Park. This driveway does not have a phase at the signalized intersection, which affects vehicles exiting the parking lot. CT-151 (Middle Haddam Road/Moodus Road) has a posted speed limit of 35 mph and CT-439 (Hurd Park Road) has a posted speed limit of 25 mph.

Recommendations:

- Consider installing new advance warning beacons along both eastbound and westbound CT-151 (Middle Haddam Road) approaches that are interconnected with the traffic control signal and be prepared to stop signs supplemented with when flashing placards.
- Consider installing battery backup due to frequent power outages at this intersection.
- Consider installing no turn on red signage for all approaches.
- Consider actuated phase for the park driveway at this intersection.

CT-151 (Middle Haddam Road/Moodus Road) and CT-439 (Hurd Park Road)/Hog Hill Road looking east. Source: VN Engineers

Signal Ahead warning sign with flashing beacons. Source: VN Engineers

Field Site Inventory

CT-16 (Colchester Avenue) and Tartia Road

CT-16 (Colchester Avenue) is a two-lane roadway, with one lane in each direction. CT-16 (Colchester Avenue) forms a three-way intersection with Tartia Road, with CT-16 (Colchester Avenue) operating under free-flow and Tartia Road under stop control. This intersection is in the middle of a reverse curve, with curve warning and chevron signs along CT-16 (Colchester Avenue). The sight distance is limited along both approaches of CT-16 (Colchester Avenue) at Tartia Road, though the Tartia Road approach already has separate storage for the left- and right-turning movements. The posted speed limit on CT-16 (Colchester Avenue) at this intersection is 45 mph, though the speed limit along this corridor varies between 40 and 50 mph nearby.

Recommendations:

- Consider the installation of optical speed bars along both approaches of CT-16 (Colchester Avenue) to Tartia Road.
- Consider the installation of dynamic speed feedback signs in advance of the reverse curve in both directions on CT-16 (Colchester Avenue).

CT-16 (Colchester Avenue) and Tartia Road looking east. Source: VN Engineers

CT-16 (Colchester Avenue) and Tartia Road. Source: VN Engineers

East Hampton Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-151 (Middle Haddam Rd/Moodus Rd) and CT-439 (Hurd Park Rd)/Hog Hill Rd	Limited sight distance	Consider installing new advance warning beacons along both eastbound and westbound CT-151 (Middle Haddam Road) approaches that are interconnected with the traffic control signal and be prepared to stop signs supplemented with when flashing placards	Medium
		Consider installing no turn on red signage for all approaches	Low
	Signal operations	Consider installing battery backup due to frequent power outages at this intersection	Low
		Consider an actuated phase for the Hurd State Park driveway parking lot at this intersection. Currently, vehicles do not have a signal phase to exit the parking lot at the signalized intersection	Low
CT-16 (Colchester Ave) and Tartia Rd	Limited sight distance	Consider the installation of optical speed bars along both approaches of CT-16 (Colchester Avenue) to Tartia Road	Low
		Consider the installation of dynamic speed feedback signs in advance of the reverse curve in both directions	Low
CT-66 (Portland-Cobalt Rd/West High St) and CT-151 (Middle Haddam Rd)/ Depot Hill Rd	Crashes related to congestion and capacity limitations	If right-of-way allows, consider the addition of left-turn lanes on CT-66 (Portland-Cobalt Rd/West High St) at CT-151 (Middle Haddam Rd)/Depot Hill Rd	Medium-High
Village Center	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
		Consider narrowing travel lanes to 11 feet in Village Center	Low
		Consider the installation of optical speed bars in Village Center	Low
CT-16 (Middletown Ave) and CT-196 (Skinner St/ Young St)	Signal operations	Install battery backup because of frequent power outages at this intersection	Low

TOWN OF ESSEX

2020 Population Estimate: 6,260

Area: 10.4 square miles

Population Density: 602 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 62,578,286

Latest (2016) VMT per Capita: 9,997

Setting: Rural

Town and Regional Representatives: Maria Lucarelli (First Selectman), Ryan Welch (Public Works Director), Norm Needleman (Connecticut State Senator), John Guszkowski (Planning Commission), Mark Roberts (Resident Trooper), Paul Kenefick (Police Department), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 3

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 76

CT-153 (Plains Road). Source: VN Engineers

Overview

Essex is a town in Middlesex County, bordered by Deep River to the north, Lyme to the east, Deep River and Westbrook to the west, and Westbrook and Old Saybrook to the south. The Town's main thoroughfares are CT-9, CT-153, CT-154, CT-602, and CT-604.

Essex Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	0	0	1	0
Suspected Serious Injury (A)	0	0	0	0	0
Suspected Minor Injury (B)	11	8	4	6	6
Possible Injury (C)	3	10	10	10	7
Total Injury Crashes	14	18	14	17	13

Town's Input

Fatal Crashes from 2015-2019

- **Gates Road** - Medical-related, roadway departure fatal crash.

CT-154/604 (Deep River Road) Southbound and CT-154/604 (Main Street)
This intersection is a high frequency crash location. However, driveway access management modifications at the Cumberland Farms on CT-154/604 (Main Street) have improved conditions.

CT-153 (Plains Road) and CT-604 (Westbrook Road)/Bokum Road
This four-way signalized intersection has a speed limit of 35 mph on the mainline of CT-153 (Plains Road). The Town is concerned that the right turns on red from Bokum Road northbound onto CT-153 (Plains Road) eastbound have contributed to the crash history at this location. Though there is adequate sight distance, the Town has discussed the possibility of a No turn on red restriction for the Bokum Road northbound movement. The Town also noted that with senior housing complex located near this intersection, an older driving population could also be a contributing factor to the number of crashes.

CT-154 (Middlesex Avenue) near CT-9 (Chester Bowles Highway)
The Town is in the process of installing a crosswalk across CT-154 (Middlesex Avenue) between CT-9 (Chester Bowles Highway) and the railroad crossing, with rectangular rapid flashing beacons (RRFBs). This is currently in design and the Essex Public Works Department is working with CTDOT. The Town has placed an emphasis on the importance of a safe pedestrian crossing from the sidewalks on the north side of CT-154 (Middlesex Avenue), ending at Essex Plaza to the west, to the future sidewalks on the south side. Since the roadway cross section is wide, at approximately 50 feet at this location, the Town wants to install a median island along CT-154 (Middlesex Avenue) to serve as a refuge for pedestrians. The Town also noted the potential importance of adding wayfinding signs to assist motorists unfamiliar with this area in navigating from CT-9 (Chester Bowles Highway) to various destinations in town.

CT-9 (Chester Bowles Highway) Southbound Exit 3 Off-Ramp/CT-621 and CT-154 (Middlesex Avenue)
CT-612 serves as a connector road between CT-154 (Middlesex Avenue) and CT-153 (Plains Road), which intersects each at an acute angle. As a result of both intersections being angled, drivers experience visibility issues and have to look back over their shoulder to see oncoming traffic. The Town previous asked CTDOT to convert CT-621 to a one-way segment, but this remains unresolved.

CT-154 (Middlesex Avenue) and CT-153 (Plains Road)/West Avenue
The Town noted that vegetation located in the median creates sight line obstructions. As a result, trimming may be needed to reduce the height of the bushes and improve sight lines.

CT-602 (Main Street) and Bracket Lane
This intersection is part of horizontal curvature on CT-602 (Main Street), where roadway departure crashes have occurred. The Town believes that this location could be a candidate for high friction surface treatment.

CT-153 (Westbrook Road/Plains Road) and Mares Hill Road
The Town has safety concerns at this intersection because of issues regarding visibility, speed, and the angle of the intersection. The Mares Hill Road southbound approach is along a downward vertical curve and the angled intersection geometry yields a wide cross section on Mares Hill Road. There is a high frequency of front-to-rear crashes along the CT-153 (Westbrook Road/Plains Road) northbound approach, as vehicles wait for clearance to turn left onto Mares Hill Road. The horizontal curvature to the south of this intersection may also limit stopping sight distance. As a result, the Town has advocated for a left-turn lane for CT-153 (Westbrook Road/Plains Road) northbound onto Mares Hill Road.

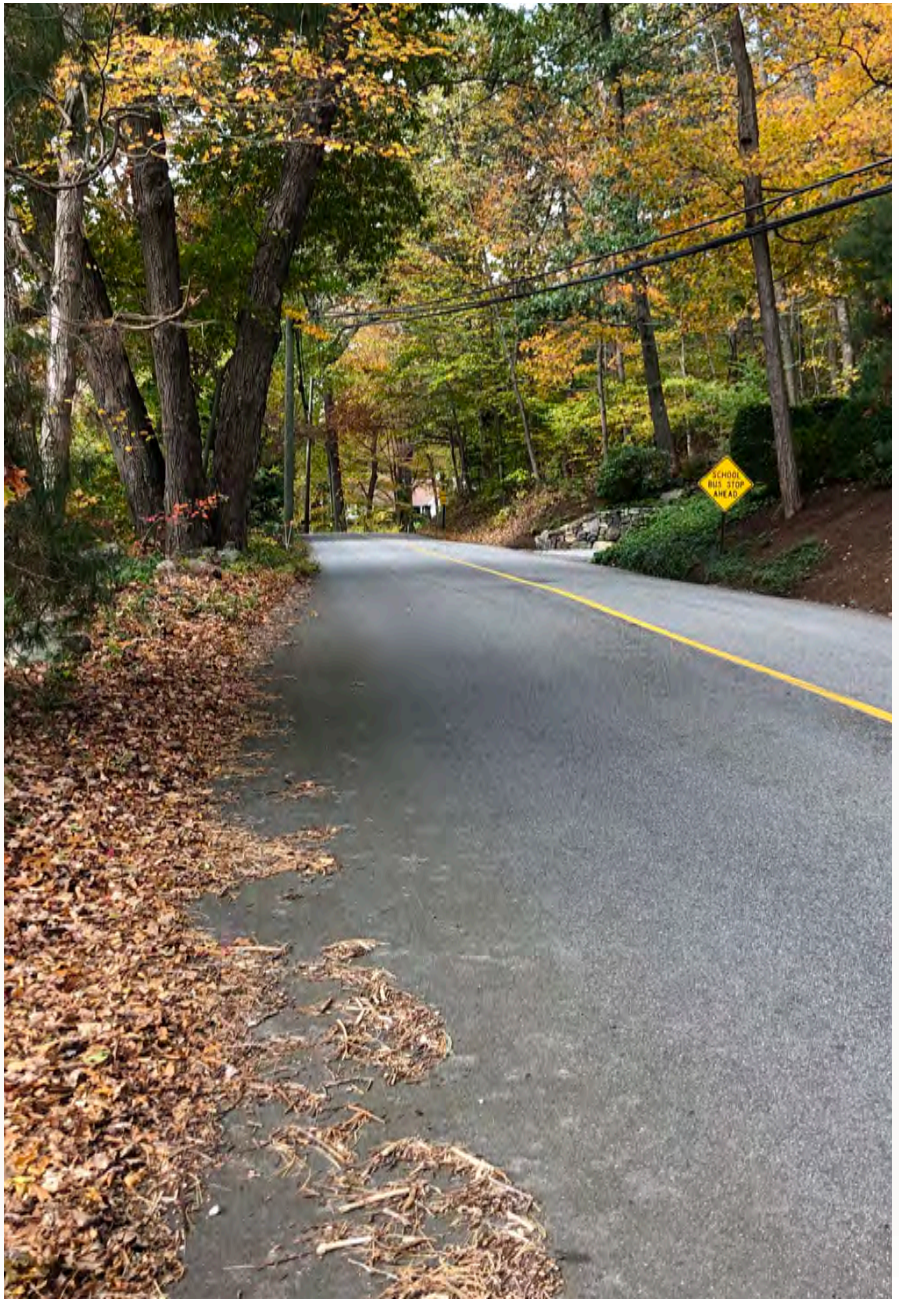
CT-154 (Deep River Road)
The Town stated that there is a cluster of crashes at the reverse curve along CT-154 (Deep River Road).

Pedestrians and Bicyclists

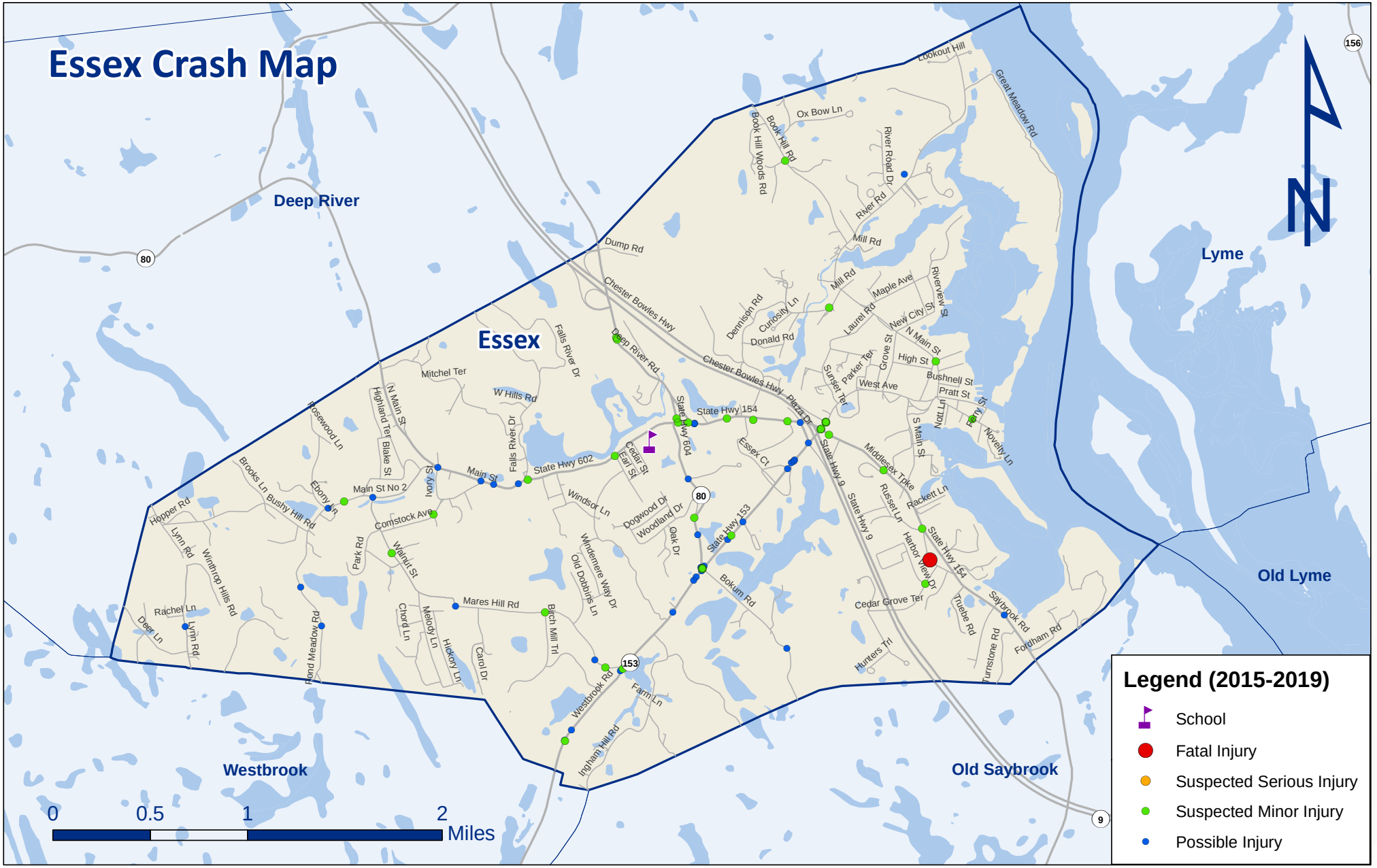
Over the last five years, the Town installed sidewalks in several locations to close gaps and increase connectivity. The Community Connectivity Grants Program (CCGP) has provided funding, which allowed for the addition of sidewalks near 76 Main Street, Essex Village, and Champlin Square. The Town would like to continue to improve sidewalk connectivity, focusing on the following locations:

- CT-604 (Westbrook Road) between CT-154/604 (Main Street) and CT-153 (Plains Road).
- River Road/North Main Street north of Mill Road.
- CT-153 (Plains Road) between Bokum Road and CT-9 (Chester Bowles Highway).

The Town also explained that the most common bike routes are along CT-154 (Middlesex Avenue/Deep River Road/Main Street) and River Road.



Mares Hill Road. Source: VN Engineers


Essex Crash Map
Deep River
Essex
Lyme
Old Lyme
Westbrook
Old Saybrook
Legend (2015-2019)
School
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0
0.5
1
2
Miles
N
Chester Bowles Hwy
Deep River Rd
Dump Rd
Falls River Dr
Mitchel Ter
W Hills Rd
Falls River Dr
Rosewood Ln
Highland Ter
Blake St
N Main St
Brooks Ln
Bushy Hill Rd
Ebony Ln
Main St No 2
Ivory St
Main St
State Hwy 602
Hopper Rd
Lynn Rd
Winthrop Hills Rd
Comstock Ave
Park Rd
Walnut St
Mares Hill Rd
Rachel Ln
Deer Ln
Lynn Rd
Pond Meadow Rd
Chord Ln
Melody Ln
Hickory Ln
Carol Dr
Birch Mill Trl
Windsor Ln
Windemere Way Dr
Old Dobbins Ln
Dogwood Dr
Woodland Dr
Oak Dr
Cedar St
Earl St
State Hwy 604
State Hwy 154
Essex Ct
State Hwy 153
Bokum Rd
Westbrook Rd
Farm Ln
Ingham Hill Rd
Plaza Dr
State Hwy 9
Middlesex Tpke
Russet Ln
Rackett Ln
Harbor View Dr
Cedar Grove Ter
Hunters Trl
Truehe Rd
Saybrook Rd
Turnstone Rd
Fordham Rd
Novelty Ln
S Main St
Pratt St
Bushnell St
High St
West Ave
Sunset Ter
Parker Ter
Grove St
New City St
Riverview St
Laurel Rd
Maple Ave
Mill Rd
Curiosity Ln
Dennison Rd
Donald Rd
River Rd
River Road Dr
Book Hill Rd
Book Hill Woods Rd
Ox Bow Ln
Lookout Hill
Great Meadow Rd
80
80
153
9
156

Field Site Inventory

CT-153 (Westbrook Road/Plains Road) and Mares Hill Road

The intersection of CT-153 (Westbrook Road/Plains Road) and Mares Hill Road is a slightly skewed, three-way intersection with one travel lane along each approach into the intersection. The CT-153 (Westbrook Road/Plains Road) approach operates under free flow conditions, while the Mares Hill Road approach has stop control. The intersection geometry is wide, with more than a 10-foot right shoulder along the westbound CT-153 (Westbrook Road/Plains Road) direction of travel. There is guide rail present along the eastbound CT-153 (Westbrook Road/Plains Road) approach and also in the westbound direction, just west of the intersection. In advance of the intersection with Mares Hill Road, there is horizontal curvature with warning signs along the eastbound CT-153 (Westbrook Road/Plains Road) direction of travel. This skewed intersection has vegetation overgrowth, which limits sight distance for vehicles turning from Mares Hill Road, particularly looking east. CT-153 (Westbrook Road/Plains Road) has a posted speed limit of 40 mph.

Recommendations:

- Consider the installation of left-turn lane for eastbound CT-153 (Westbrook Road/Plains Road) at the intersection with Mares Hill Road.
- Consider realigning the skewed intersection.
- Consider trimming excess vegetation on CT-153 (Westbrook Road/ Plains Road) to improve visibility at Mares Hill Road.

Mares Hill Road at CT-153 (Westbrook Road/Plains Road) looking east. Source: VN Engineers

CT-153 (Westbrook Road/Plains Road) looking southwest. Source: VN Engineers

Field Site Inventory

CT-154 (Middlesex Avenue) and CT-9 (Chester Bowles Highway) Exit 3 Southbound Off-Ramp

The paved roadway cross-section of CT-154 (Middlesex Avenue) between the CT-9 (Chester Bowles Highway) Exit 3 southbound off-ramp and the at-grade railroad crossing is extremely wide, at about 50 feet, with no edge line pavement markings to better define travel lanes and adjacent shoulders. However, just to the east of the CT-9 (Chester Bowles Highway) Exit 3 southbound off-ramp, there is a landscaped center median with appropriately sized travel lanes in each direction, to address the wide roadway cross-section. The sidewalk on the northern side of the road, east of the railroad crossing, terminates at the entrance to Essex Plaza and does not connect with the sidewalk that is on the south side of the road west of the railroad crossing, leaving a gap in the sidewalk system of about 400 feet.

Recommendations:

- Consider a road diet for the section of CT-154 (Middlesex Avenue) between the at-grade railroad crossing and the CT-9 (Chester Bowles Highway) Exit 3 southbound off-ramp, to better define the travel lanes and adjacent shoulders.
- Consider extending the existing CT-154 (Middlesex Avenue) center median to the CT-9 (Chester Bowles Highway) Exit 3 southbound off-ramp, to reduce travel lane widths and define the shoulders with edge striping.
- Consider extending the existing sidewalk on both the north and south sides of the roadway to a designated pedestrian crossing on the east side of the at-grade railroad crossing.
- Consider the installation of pedestrian railroad crossing gates, given the high volumes of traffic along CT-154 (Middlesex Avenue) and the active at-grade railroad crossing. A rectangular rapid flashing beacon (RRFB) should be considered to clearly designate the midblock pedestrian crossing.

CT-154 (Middlesex Avenue) pedestrian mobility west of CT-9 (Chester Bowles Highway) Exit 3 southbound looking west. Source: VN Engineers

Essex Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-153 (Westbrook Rd/ Plains Rd) and Mares Hill Rd	Congestion and capacity limitations	Consider the installation of a left-turn lane for eastbound CT-153 (Westbrook Rd/Plains Rd) at the intersection with Mares Hill Rd	Medium-High
	Limited sight distance	Consider realigning the skewed intersection to a T-intersection	Medium-High
		Consider trimming excess vegetation on CT-153 (Westbrook Rd/Plains Rd) to improve visibility at Mares Hill Rd	Low
CT-154 (Middlesex Ave) and CT-9 (Chester Bowles Hwy) Exit 3 Southbound Off-Ramp	Speeding and wide roadway cross-section	Consider a road diet for the section of CT-154 (Middlesex Ave) between the at-grade railroad crossing and the CT-9 (Chester Bowles Hwy) Exit 3 Southbound off-ramp	Low-Medium
		Consider extending the existing CT-154 (Middlesex Ave) center median to the CT-9 (Chester Bowles Hwy) Exit 3 southbound off-ramp	Medium
	Pedestrian mobility	Consider extending the existing sidewalk on both the north and south sides of the roadway to a designated pedestrian crossing on the east side of the at-grade railroad crossing	Medium-High
		Consider the installation of pedestrian railroad crossing gates, given the high volumes of traffic along CT-154 (Middlesex Ave) and the active at-grade railroad crossing. A RRFB should be considered to clearly designate the midblock pedestrian crossing	Low
CT-154 (Middlesex Ave) and CT-153 (Plains Rd)/ West Ave	Limited sight distance	Consider trimming vegetation to reduce the height of bushes and improve sight lines	Low
CT-602 (Main St) and Bracket Ln	Roadway departure crashes	Consider installation of centerline and shoulder rumble strips	Low

TOWN OF HADDAM

2020 Population Estimate: 8,843

Area: 44.0 square miles

Population Density: 201 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 133,623,887

Latest (2016) VMT per Capita: 15,111

Setting: Rural

Town and Regional Representatives: Bill Warner (Town Planner), Christopher Corsa (Assistant Director of Public Works), Joseph Deangelo (Haddam Resident State Trooper), Patrick Pinnell (Haddam Resident), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: CT-81 (Killingworth Road) from CT-9 (Chester Bowles Highway) southbound on- and off-ramps to Woods Road

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 3

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 173

CT-154 (Saybrook Road) and CT-81(Killingworth Road)/Depot Road.
Source: VN Engineers

Overview

Haddam is a town in Middlesex County bordered by Middletown and East Hampton to the north, East Haddam to the east, Durham and Killingworth to the west, and Killingworth and Chester to the south. The town has four dispersed village centers, unusual within a single town, and has a section on the opposite bank of the Connecticut River. The Town's main thoroughfares are CT-9, CT-81, CT-82, CT-151, and CT-154. While the crash data used in this analysis is pre-pandemic (2015-2019), evidence suggests that Covid-19 has produced significant changes in aggressive and distracted driving, with consequences for road and street users of every kind. Among other recommendations, lower speed limits could help to mitigate these impacts in Haddam.

Haddam Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	1	0	1	2
Suspected Serious Injury (A)	2	1	0	2	1
Suspected Minor Injury (B)	19	7	15	20	20
Possible Injury (C)	17	19	15	15	16
Total Injury Crashes	38	28	30	38	39

Town's Input

Fatal Crashes from 2015-2019

- **CT-81 (Killingworth Road)** - Front-to-front crash through a reverse curve with no centerline rumble strips.
- **CT-151 (Moodus Road)** - Daylight, glare-induced fatal crash.
- **CT-154 (Saybrook Road) south of Field Park Road** - Motorcycle speed and substance-impaired fatal crash.
- **CT-154 (Saybrook Road) and Jail Hill Road** - Bicyclist fatal crash.

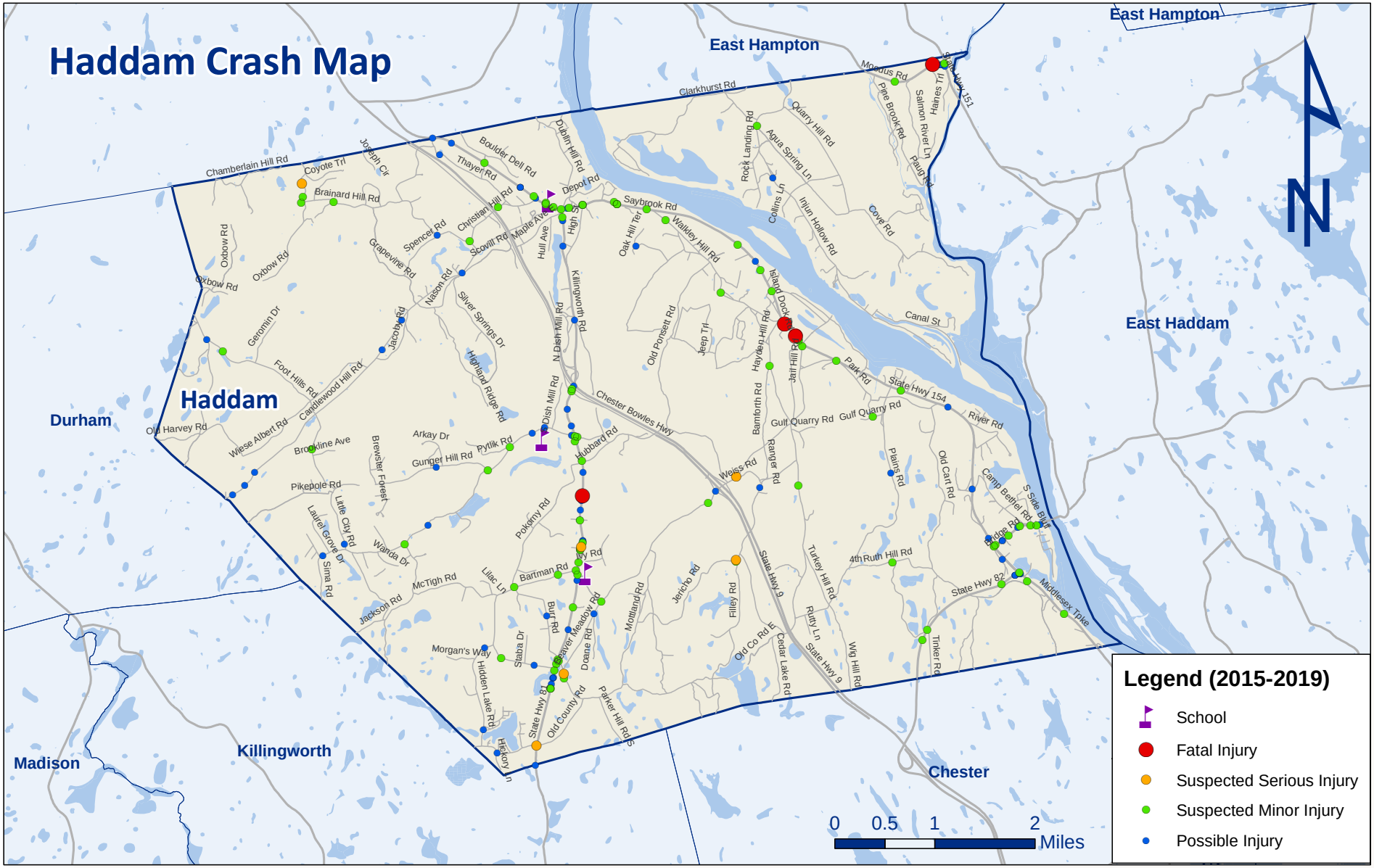
CT-81 (Killingworth Road)/Depot Road and CT-154 (Saybrook Road)
This offset four-way signalized intersection in the center of town and in the commercial center for Haddam has a high number of intersection crashes. Although the speed limit on CT-154 (Saybrook Road) is 35 mph, the Town has speeding concerns, especially in the center of town. The center of town lies at a lower elevation and all roadways leading into it are along downward grades, which increases travel speeds. In addition to downward grades, the Town is also concerned that wide roadway cross sections enable speeding. The Town suggested that narrowing the lane widths could act as traffic calming with the town center.

CT-81 (Killingworth Road) between Hubbard Road/Pokorny Road and Bartman Road
The Town noted additional concerns about high travel speeds along this stretch of CT-81 (Killingworth Road).

CT-154 (Saybrook Road)
The corridor of CT-154 (Saybrook Road) between Hayden Hill Road and Jail Hill Road is the historic Haddam Town Center with various civic land uses, including the Haddam Town Office Building, Haddam Senior Center, and Brainerd Memorial Library. The Town is concerned about this section of roadway experiencing high travel speeds, inconsistent with the surrounding land uses. The Town requested that the State lower the speed limit in the village center of Higganum to 25 mph, but the request was denied. The Town is improving pedestrian connectivity in the Higganum area using funds from the Community Connectivity Grant Program (CCGP). The Town of Haddam intends to address the high travel speeds and continue to improve pedestrian connectivity, as mandated in the 2018 Haddam Plan of Conservation and Development.

Pedestrians and Bicyclists
To improve pedestrian connectivity, CCGP-funded sidewalks will be installed on CT-82 (Bridge Road) from CT-154 (Saybrook Road) to the railroad tracks. The design is already underway providing sidewalks from the railroad tracks to the East Haddam Swing Bridge, which connects Haddam to East Haddam. There are currently no sidewalks across the East Haddam Swing Bridge and pedestrians from East Haddam cross the bridge into Haddam to shop early in the day to avoid heavy motorized traffic. However, a six-foot-wide cantilevered pedestrian walkway will be added to the bridge in impending work. Speeding is the main deterrent in town for safe walking and bicycling not just on CT-82 (Bridge Road), but also on CT-154 (Saybrook Road), which is a high-traveled corridor for avid cyclists.

Haddam Swing Bridge. Source: Tripadvisor


Haddam Crash Map
East Hampton
East Hampton
East Haddam
Haddam
Durham
Killingworth
Madison
Chester
Chamberlain Hill Rd
Coyote Trl
Brainard Hill Rd
Joseph Cir
Boulder Dell Rd
Thayer Rd
Dublin Hill Rd
Depot Rd
Clarkhurst Rd
Moodus Rd
Pine Brook Rd
Salmon River Ln
Haines Trl
State Hwy 151
Rock Landing Rd
Quarry Hill Rd
Aqua Spring Ln
Collins Ln
Injun Hollow Rd
Cove Rd
Saybrook Rd
Oak Hill Ter
Walkley Hill Rd
Island Dock Rd
Canal St
Park Rd
State Hwy 154
River Rd
Gulf Quarry Rd
Jail Hill Rd
Hayden Hill Rd
Bamforth Rd
Old Ponsett Rd
Jeep Trl
Killingworth Rd
N Dish Mill Rd
Dish Mill Rd
Chester Bowles Hwy
Hubbard Rd
Christian Hill Rd
Spencer Rd
Grapevine Rd
Scovill Rd
Maple Ave
Hull Ave
High St
Nason Rd
Silver Springs Dr
Highland Ridge Rd
Jacobus Rd
Oxbow Rd
Geromin Dr
Foot Hills Rd
Candlewood Hill Rd
Old Harvey Rd
Wiese Albert Rd
Brookline Ave
Brewster Forest
Arkay Dr
Gunger Hill Rd
Pytlik Rd
Pikepole Rd
Little City Rd
Laurel Grove Dr
Sima Rd
Wanda Dr
McTigh Rd
Jackson Rd
Lilac Ln
Bartman Rd
Pokorny Rd
Burr Rd
Beaver Meadow Rd
Doane Rd
Morgan's Way
Staba Dr
Hidden Lake Rd
Hickory Ln
State Hwy 82
Old County Rd
Parker Hill Rd
Modtland Rd
Jericho Rd
Filley Rd
Old Co Rd Ln
Cedar Lake Rd
State Hwy 9
Turkey Hill Rd
Ruthy Ln
Wig Hill Rd
Weiss Rd
Ranger Rd
Plains Rd
Old Cart Rd
Camp Bethel Rd
S Side Blvd
Bridge Rd
4th Ruth Hill Rd
State Hwy 82
Middlesex Tpke
Tinker Rd
N
0 0.5 1 2 Miles
Legend (2015-2019)
School
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury

Field Site Inventory

CT-154 (Saybrook Road) between Hayden Hill Road and Jail Hill Road

CT-154 (Saybrook Road) between Hayden Hill Road and Jail Hill Road represents the historic Village Center of Haddam, with various civic land uses, including the town hall, library and senior center. The roadway corridor consists of one travel lane and an adjacent shoulder in each direction, with a posted travel speed of 45 mph. A sidewalk separated by a grass snow shelf is located on the eastern side of the roadway and there is a midblock pedestrian crossing in the vicinity of the unsignalized intersection of School House Lane. This section of CT-154 (Saybrook Road) experiences high travel speeds, which is inconsistent with the surrounding land uses and historic nature of the area.

Recommendations:

- Consider reducing the posted speed limit through the historic Village Center area.
- Consider installing traffic calming measures, such as gateway treatments, as well as improved and additional sidewalks, to more clearly designate and highlight this area as a village center.
- Consider improving and adding sidewalks, to more clearly designate and highlight this area as a village center.

CT-154 (Saybrook Road) between Hayden Hill Road and Jail Hill Road looking north. Source: VN Engineers

Field Site Inventory

CT-81 (Killingworth Road)/Depot Road and CT-154 (Saybrook Road), in the vicinity of Candlewood Hill Road

CT-154 (Saybrook Road) and CT-81 (Killingworth Road) is a wide, offset, signalized intersection, with Candlewood Hill Road to the west under stop control. These two major through routes meet within a fairly active Higganum village center, with pedestrian and bicyclists sharing the road. There are crosswalks along all legs of the signalized intersection and a pedestrian beacon with an exclusive phase.

The CT-154 (Saybrook Road) westbound and eastbound approaches to the intersection are along downward grades. There is a wide access driveway parking lot adjacent to the road on CT-154 (Saybrook Road) westbound, just east of the intersection. To exit, motorists reverse directly into the travel lane, as motorists on CT-154 (Saybrook Road) proceed along the downgrade causing potential conflicts.

The speed limits along CT-154 (Saybrook Road) and CT-81 (Killingworth Road) are posted at 35 mph. There are decorative flags lining CT-154 (Saybrook Road) eastbound, which act as a traffic calming gateway treatment. The CT-81 (Killingworth Road) approach and CT-154 (Saybrook Road) westbound approach do not have flags. The CT-81 (Killingworth Road) cross section is wide and has a few midblock crossings. Haddam Elementary School is located west of the intersection on the north side of CT-154 (Saybrook Road).

Recommendations:

- Consider narrowing all travel lanes to 11 feet.
- Consider bump outs at all pedestrian crossings at the intersection and along the approaches.
- Consider adding No Turn on Red regulatory signs to all signals to protect pedestrians.
- Consider lowering the speed to 25 mph throughout the village and adding dynamic speed feedback signs.
- Consider adding on-street parking.

CT-154 (Saybrook Road) and CT-81 (Killingworth Road)/Depot Road looking west.
Source: VN Engineers

Haddam Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-154 (Saybrook Rd) between Hayden Hill Rd and Jail Hill Rd	Speeding	Consider reducing the posted speed limit through the historic Village Center area	Low
		Consider installing traffic calming measures, such as gateway treatments, to more clearly designate and highlight this area as a village center	Low
		Consider improving and adding sidewalks, to more clearly designate and highlight this area as a village center	Medium-High
CT-81 (Killingworth Rd)/ Depot Rd and CT-154 (Saybrook Rd), in the vicinity of Candlewood Hill Rd	Speeding	Consider narrowing all travel lanes to 11 feet	Low-Medium
		Consider lowering the speed limit to 25 mph through the village and installing dynamic speed feedback signs	Low
		Consider adding on-street parking	Low
	Pedestrian safety	Consider adding No Turn on Red regulatory signs to all signals to protect pedestrians	Low
		Consider bump outs at all pedestrian crossing at the intersection and along the approaches	Medium
Townwide	Speeding, particularly on CT-82 (Bridge Rd) and CT-154 (Saybrook Rd)	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium

TOWN OF KILLINGWORTH

2020 Population Estimate: 6,282

Area: 35.3 square miles

Population Density: 178 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 46,460,222

Latest (2016) VMT per Capita: 7,396

Setting: Rural

Town and Regional Representatives: Catherine Lino (First Selectwoman), Richard Mulhall (Resident State Trooper), Elizabeth Disbrow (Assistant to the First Selectwoman), Walter Adametz (Public Works), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 1

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 107

CT-148 (Tooley Road/Chester Road)looking west. Source: VN Engineers

Overview

Killingworth is a rural town in Middlesex County bordered by Durham and Haddam to the north, Chester, Deep River, and Westbrook to the east, Clinton and Madison to the south, and Madison to the west. The Town's main thoroughfares are CT-79, CT-80, CT-81, and CT-148.

Killingworth Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	1	0	0	0	0
Suspected Serious Injury (A)	0	2	0	1	2
Suspected Minor Injury (B)	7	10	14	7	17
Possible Injury (C)	12	8	8	11	7
Total Injury Crashes	20	20	22	19	26

Town's Input

Fatal Crashes from 2015-2019

- **CT-148 (Tooley Road), just west of intersection of CT-148 (Tooley Road/Chester Road) and CT-81 (Higganum Road)** - Young, distracted driver, motorcycle fatal crash.

CT-148 (Tooley Road/Chester Road) and CT-81 (Higganum Road)
This four-way signalized intersection is the site of a few crashes, including a fatality. The southbound CT-81 (Higganum Road) approach has roadway curvature in advance of the traffic signal, which impedes motorists' sight distance. There is an advance intersection warning sign with flashing beacons along the southbound CT-81 (Higganum Road) approach. The Town noted that motorists on CT-81 (Higganum Road) often run the red light.

CT-81 (Higganum Road) and Lovers Lane
The three-way intersection is stop-controlled at Lovers Lane and has free flow operations along CT-81 (Higganum Road). The intersection is skewed with limited sight distance. As a result, there have been a number of crashes when motorists stop along northbound CT-81 (Higganum Road) to make the left turn onto Lovers Lane and approaching motorists cannot see the queue. The Town noted that the intersection of CT-81 (Higganum Road) and Lovers Lane has drainage and flooding issues as well.

CT-80 (North Branford Road/Deep River Road) and CT-81 (Higganum Road and Clinton Road)
This intersection is a roundabout, with traffic approaching from four directions. Islands were added after the initial design to separate directional traffic and slow down motorists approaching the roundabout. The Town stated that there are deterioration issues with the curbing.

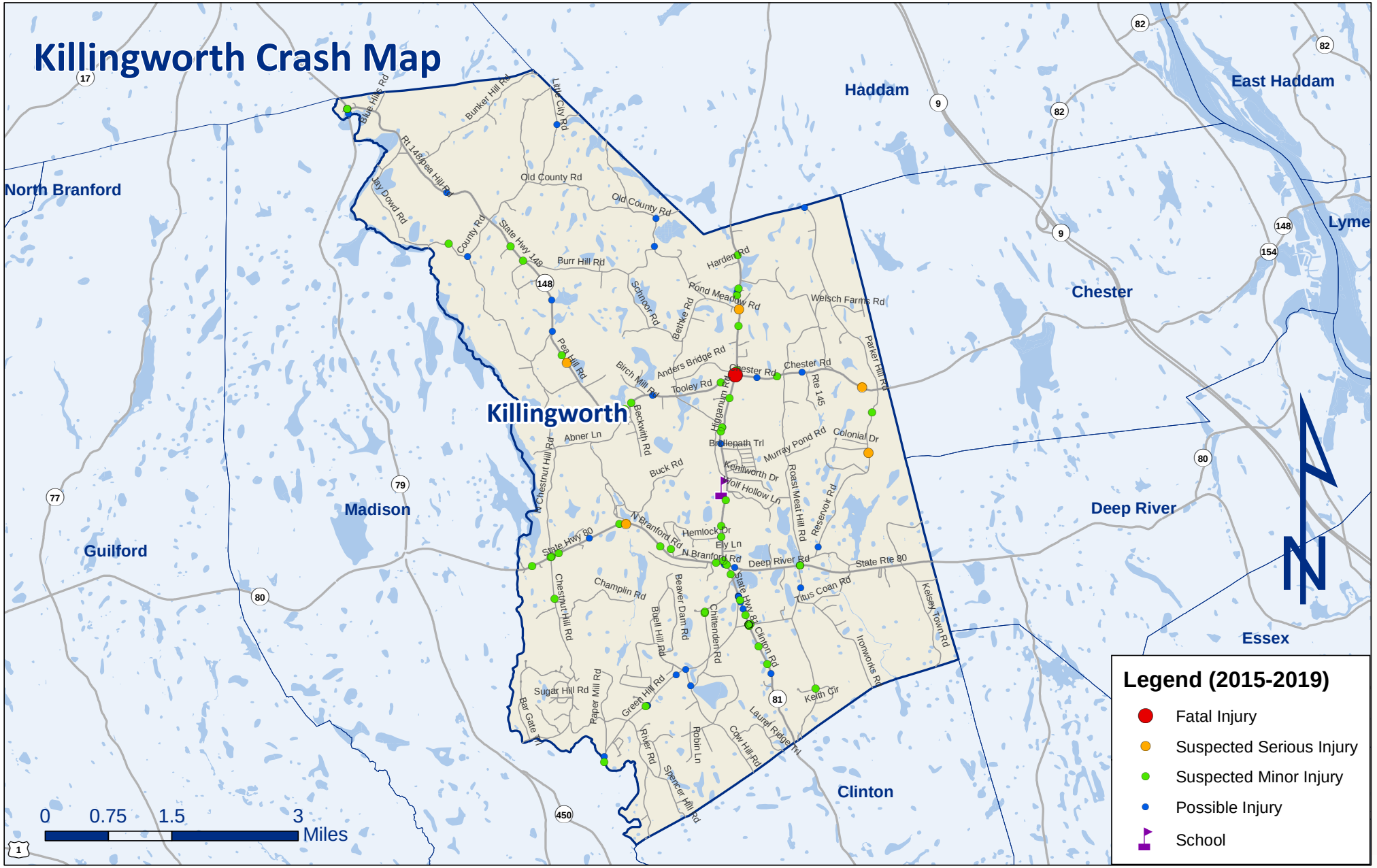
CT-148 (Killingworth-Durham Rd) near Kroopa Pond
This stretch of CT-148 (Killingworth-Durham Road) near Kroopa Pond has a series of crashes through horizontal and vertical curvature, though speeding is also a contributing factor. This corridor has a high number of motorcycle crashes and is a popular route for motorcyclists. There is also a high number of roadway departure crashes, which the Town noted could make this a possible candidate for high friction surface treatments. The Town also stated that the warning signage seems particularly inadequate through the reverse curve. As a result of sight distance concerns, the State recently cleared vegetation from the right-of-way.

CT-80 (Deep River Road) and Roast Meat Hill Road
The four-way intersection is stop-controlled along the Roast Meat Hill Road approaches and has free flow operations along CT-80 (Deep River Road). The Town is concerned about speeding along the CT-80 (Deep River Road) corridor. This is a high crash intersection. The northbound Roast Meat Hill Road skew blocks the sightline of motorists approaching the intersection with CT-80 (Deep River Road). The Town noted that vegetation can also impede the sight distance. The Town has worked with the Connecticut Technology Transfer (T2) Center's Safety Circuit Rider program to address some of the concerns at this intersection. Roast Meat Hill Road is used as an alternative route to CT-81 (Higganum Road) traffic and is also a common pedestrian route, even though it is a narrow route with no shoulders.

CT-81 (Clinton Road), south of CT-80 (North Branford Road/Deep River Road), near Stevens Road
This portion of CT-81 (Clinton Road) has a high number of crashes, particularly at the intersection with Stevens Road. Angle crashes are the most common incidents at this intersection. The Town has requested lowering the speed limit from 40 mph, but the State did not think that this was warranted. There are currently no centerline rumble strips along this segment.

Speeding
In an effort to reduce speeding, the Town has added edge lines and installed a dynamic speed feedback sign along Green Hill Road, between River Road and the Madison Town Line.

Bicyclists and Pedestrians
CT-148 (Killingworth-Durham Road/Tooley Road/Chester Road) is a common bike route in town. The Town also lacks sidewalk connectivity due to its rural character.


Killingworth Crash Map
Killingworth
Haddam
East Haddam
North Branford
Madison
Guilford
Chester
Deep River
Essex
Clinton
Lyme
Legend (2015-2019)
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
School
0 0.75 1.5 3 Miles
N
Bunker Hill Rd
Lyme City Rd
Old County Rd
Burr Hill Rd
State Hwy 148
Harden Rd
Pond Meadow Rd
Welsch Farms Rd
Anders Bridge Rd
Chester Rd
Tooley Rd
Rte 145
Parker Hill Rd
Colonial Dr
Murray Pond Rd
Kenilworth Dr
Wolf Hollow Ln
Roast Meat Hill Rd
Reservoir Rd
Abner Ln
Buck Rd
Chestnut Hill Rd
Beckwith Rd
N Branford Rd
State Hwy 80
Hemlock Dr
Ely Ln
Deep River Rd
State Rte 80
Champlin Rd
Titus Coan Rd
Kelsey Town Rd
Beaver Dam Rd
Buell Hill Rd
Chittenden Rd
State Hwy 81
Clinton Rd
Ironworks Rd
Sugar Hill Rd
Paper Mill Rd
Green Hill Rd
Keith Cir
Laurel Ridge Trl
Cow Hill Rd
River Rd
Robin Ln
Spencer Hill Rd
Bar Gate Trl

Field Site Inventory

CT-81 (Clinton Road) and Green Hill Road

CT-81 (Clinton Road) is a two-lane roadway, with one travel lane in each direction. The shoulders are two feet wide. The intersection with Green Hill Road occurs at a 90° angle at the top of a vertical crest curve. At the crest there is a Side Road Left and Right signs for Green Hill Road on CT-81 (Clinton Road). Green Hill Rd is a two-lane rural road with 2 foot wide shoulders. The posted speed limit is 40 mph. Immediately after the intersection with CT-81 (Clinton Road), Green Hill Road takes a 90° turn to the south. This turn, as well as several trees, block the line of sight to the intersection. This is alleviated by a Stop Ahead Sign for motorists on Green Hill Road. There are several chevrons and a non-MUTCD-compliant watch for children sign at this curve. The intersection is not illuminated.

Recommendations:

- Consider the installation of illumination at the intersection.
- Consider replacing signage at the intersection to be MUTCD-compliant.
- Consider the installation of dynamic speed feedback signs.
- Consider the implementation of high visibility speed enforcement.
- Consider trimming and removing vegetation that blocks sight distance.

Green Hill Road and CT-81 (Clinton Road) looking east. Source: VN Engineers

CT-81 (Clinton Road) and Green Hill Road looking north. Source: VN Engineers

Field Site Inventory

CT-148 (Killingworth-Durham Road), in the vicinity of Kroopa Pond

CT-148 (Killingworth-Durham Road) is a two-lane road, with one lane in each direction. The travel lanes are narrow in this area and there are no shoulders. The posted speed limit is 25 mph. East of Kroupa Pond, CT-148 (Killingworth-Durham Road) has a sharp reverse curve, which is on an ascending grade when travelling eastbound. Also, at this location, there is an intersection with Beckwith Road which is under stop control, while CT-148 (Killingworth-Durham Road) is free flow. Guide rail is present on both sides of CT-148 (Killingworth-Durham Road), but only west of the reverse curve. Signage at the reverse curve includes two sets of one-direction large arrows. Advance warning is only present on CT-148 (Killingworth-Durham Road) westbound, and consists of a Turn Right Side Road Left sign with a 20 mph speed placard. There is no advance warning for CT-148 (Killingworth-Durham Road) eastbound. The reverse curve is not illuminated. During this field visit, multiple vehicles navigating this reverse curve were observed to cross over the double-yellow line, including a tri-axle dump truck.

Recommendations:

- Consider the installation of illumination along this corridor.
- Consider installation of advance warning signage with a speed placard along CT-148 (Killingworth-Durham Road) eastbound.
- Replace the Turn Right Side Road Left sign on CT-148 (Killingworth-Durham Road) westbound with a sign that better reflects the configuration of the reverse curve.
- Consider installing flashing lights on the advance warning signs on CT-148 (Killingworth-Durham Road).
- Consider installing centerline rumble strips.

CT-148 (Killlingworth-Durham Road) looking west at Beckwith Road. Source: VN Engineers

CT-148 (Killingworth-Durham Road) and Beckwith Road. Source: VN Engineers

Killingworth Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-81 (Clinton Rd) and Green Hill Rd	Replace signage	Consider replacing signage at the intersection to be MUTCD-compliant	Low
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
	Visibility	Consider the installation of illumination at the intersection	Medium
CT-148 (Killingworth -Durham Rd), in the vicinity of Kroopa Pond	Roadway curvature	Consider installing centerline rumble strips	Low
		Consider installing flashing lights on the advance warning signs on CT-148 (Killingworth-Durham Rd)	Low
	Missing and replace signage	Consider installation of advance warning signage with a speed placard along CT-148 (Killingworth-Durham Rd) eastbound	Low
		Replace the Turn Right Side Road Left sign on CT-148 (Killingworth-Durham Rd) westbound with a sign that better reflects the configuration of the reverse curve	Low
	Visibility	Consider the installation of illumination along this corridor	Medium

TOWN OF LYME

2020 Population Estimate: 2,567

Area: 31.9 square miles

Population Density: 80 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 16,454,251

Latest (2016) VMT per Capita: 6,410

Setting: Rural

Town and Regional Representatives: Steven Mattson (First Selectman), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 0

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 29

CT-156 (Hamburg Road)looking north. Source: VN Engineers

Overview

Lyme is a rural town in New London County, bordered by East Haddam and Salem to the north, East Lyme to the east, Chester, Deep River, and Essex to the west separated by the Connecticut River, and Old Lyme to the south. The Town's main thoroughfares are CT-82, CT-148, CT-156, and CT-431.

Lyme Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	0	1	0	0
Suspected Serious Injury (A)	0	1	0	0	0
Suspected Minor Injury (B)	2	4	0	3	4
Possible Injury (C)	3	2	3	5	1
Total Injury Crashes	5	7	4	8	5

Town's Input

CT-156 (Hamburg Road) between Beaver Brook Road/Macintosh Road and the Lyme-East Haddam Town Line

There are a cluster of crashes on CT-156 (Hamburg Road) near the intersection of Beaver Brook Road and Macintosh Road. Though the posted speed limit varies, the Town noted concerns about speeding along the segment of CT-156 (Hamburg Road) and has limited law enforcement under the Connecticut State Police Resident State Trooper Program. The Town requested that the Connecticut Department of Transportation lower the speeds on CT-156 (Hamburg Road) and other state roads in town, but this request was not granted. There are no centerline rumble strips along CT-156 (Hamburg Road) or any other roadways in town, due to lack of public buy-in. There is a school zone speed limit sign on CT-156 (Hamburg Road), in front of the Lyme Consolidated School and just north of Beaver Brook Road and Macintosh Road. The Town also noted that CT-156 (Hamburg Road) is a common truck route for heavy vehicles looking to avoid CT-9 (Chester Bowles Highway).

Elys Ferry Road

Improvements have been made at the intersection of Elys Ferry Road and CT-156 (Hamburg Road) to address the severe skew. Elys Ferry Road has horizontal curvature, with some sightline restrictions along the corridor.

CT-156 (Hamburg Road) Retaining Wall at Cove Road

Between the north and south leg intersections with Cove Road, there is an antiquated retaining wall adjacent to the CT-156 (Hamburg Road) northbound travel lane. This retaining wall appears to be structurally deficient and very close to the travel lane.

General Local and State Road Challenges

The Town identified several challenges experienced on both state and local roads, including speeding. In addition, the Town noted that there are dead trees along roadways that are potential hazards, as well as vegetation growth that impacts sightlines. The Town is also challenged with balancing historic and rural roadway characteristics with modern roadway improvements.

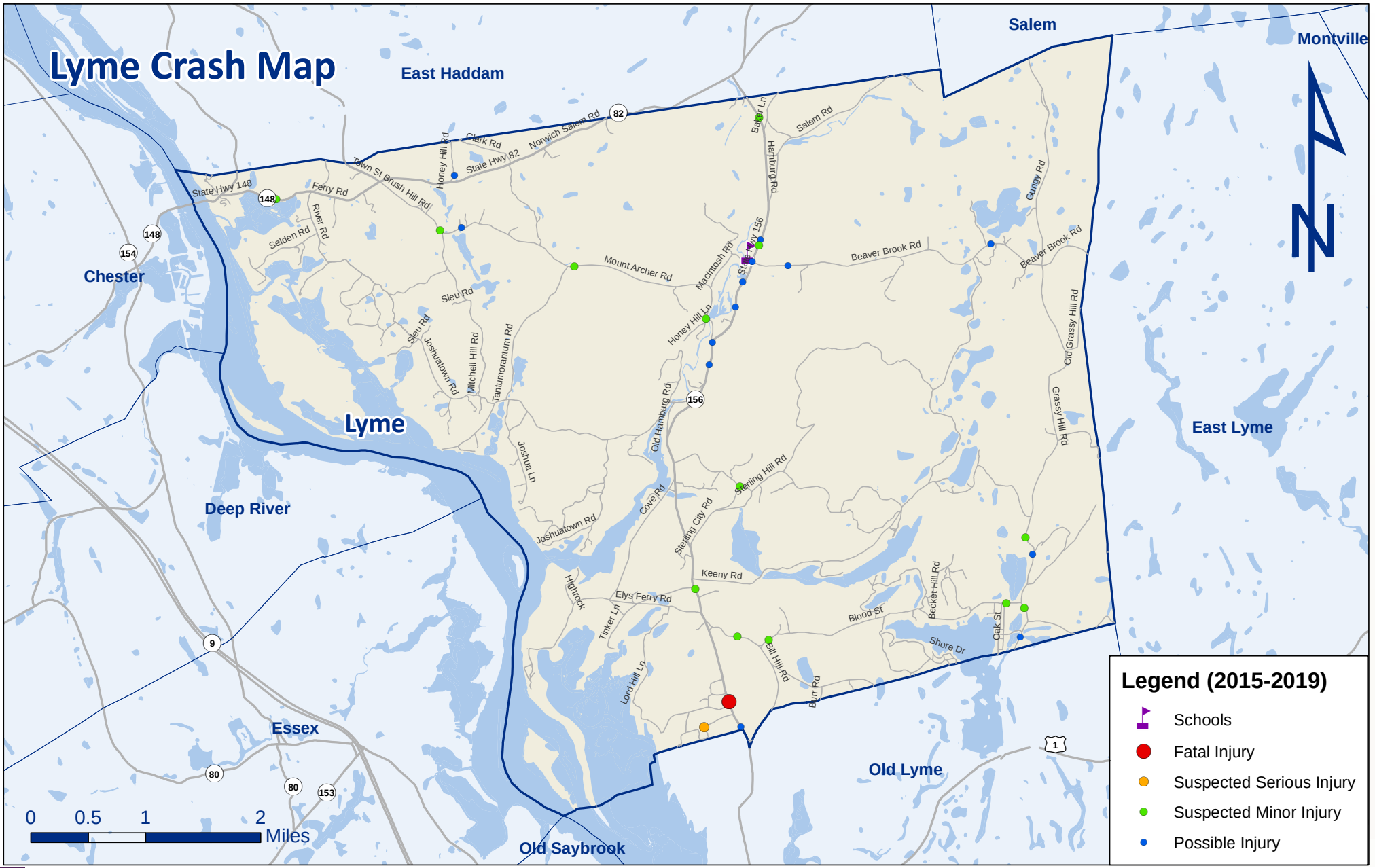
Horizontal Curve Signs

The Town does not want additional signage, unless it is context sensitive.

Pedestrians and Bicyclists

The Town noted that there are few pedestrians on state roads, but high pedestrian volumes on local roads. There are no sidewalks in town and the roadways are narrow, neither of which are conducive to pedestrian traffic. The Town also stated that there are avid bicyclists in town, despite there being no bike lanes.

CT-156 (Hamburg Road) looking south. Source: VN Engineers


Lyme Crash Map
East Haddam
Salem
Montville
Chester
Lyme
Deep River
Essex
Old Lyme
East Lyme
Old Saybrook
Mount Archer Rd
Beaver Brook Rd
Joshuatown Rd
Sleu Rd
Keeny Rd
Elys Ferry Rd
Sterling Hill Rd
Sterling City Rd
Cove Rd
Old Hamburg Rd
Honey Hill Ln
Macintosh Rd
Hamburg Rd
Salem Rd
Gungy Rd
Old Grassy Hill Rd
Grassy Hill Rd
Becket Hill Rd
Blood St
Shore Dr
Oak St
Bill Hill Rd
Burr Rd
Lord Hill Ln
Tinker Ln
Highrock
Joshua Ln
Mitchell Hill Rd
Tantumorantum Rd
Selden Rd
River Rd
Ferry Rd
Town St Brush Hill Rd
Honey Hill Rd
Clark Rd
State Hwy 82
Norwich Salem Rd
State Hwy 148
State Hwy 156
0 0.5 1 2 Miles
Legend (2015-2019)
Schools
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury

Field Site Inventory

CT-156 (Hamburg Road) at Marvin Cemetery

CT-156 (Hamburg Road) is a two-lane roadway, with one lane and varying shoulder widths in each direction. The shoulder widths at Marvin Cemetery are approximately one foot in each direction. There is slight horizontal curvature on CT-156 (Hamburg Road) to the north and south of Marvin Cemetery. CT-156 (Hamburg Road) operates under free flow conditions at this location and has a posted speed limit of 35 mph. There is a rock wall separating the cemetery from the road, approximately two feet from the edge of pavement. Just to the north of the cemetery there is a small, gravel pull-out area with enough room for one car to park. The entrance to the cemetery is a small stone staircase, leading up to the cemetery and down to the road. The lack of any sidewalks, wider shoulders, roadway lighting, or any pedestrian advance warning signage make this a potentially hazardous walk from the small parking area to the cemetery staircase entrance.

Recommendations:

- Consider addressing the structural deficiency of the wall, where the stones sometimes leave debris in the roadway.
- Consider adding advance warning signage to alert motorists of potential pedestrians at Marvin Cemetery.
- Consider the installation of dynamic speed feedback signs near the cemetery.
- Consider the implementation of high visibility enforcement near the cemetery.

CT-156 (Hamburg Road) at Marvin Cemetery looking south. Source: VN Engineers

CT-156 (Hamburg Road) at Marvin Cemetery looking north. Source: VN Engineers

Field Site Inventory

CT-156 (Hamburg Road), in the vicinity of Cove Road

CT-156 (Hamburg Road) is a two-lane roadway, with one lane and two-foot shoulders in each direction. There is a vertical crest curve on CT-156 (Hamburg Road) in between the north and south leg intersections with Cove Road. At both intersections, Cove Road is under stop control, while CT-156 (Hamburg Road) is free-flow. While both intersections are three-way intersections, the north intersection has Cove Road with a skewed approach to CT-156 (Hamburg Road). There are side road angle right up and side road angle left down warning signs for this intersection, though the warning sign to the north of this intersection is very close to Cove Road. Drivers turning onto CT-156 (Hamburg Road) from either Cove Road intersection have poor sightlines, in addition to vertical grade changes. Between the two intersections, there is guide rail with an object marker along the southbound approach of CT-156 (Hamburg Road) and a retaining wall in poor condition along the northbound approach of CT-156 (Hamburg Road). North of the intersection along CT-156 (Hamburg Road), there is an MUTCD-compliant pedestrian crossing. There is no posted speed limit in this area. There is roadway illumination in this area.

Recommendations:

- Consider trimming excess vegetation on CT-156 (Hamburg Road) to provide drivers at the intersections with Cove Road with better sightlines.
- Consider moving the Side Road Angle Right Up advance warning sign farther north to provide additional warning to motorists on CT-156 (Hamburg Road).
- Consider addressing the structural deficiency of the retaining wall that is close to the CT-156 (Hamburg Road) travel lane.

CT-156 (Hamburg Road) looking south at Cove Road. Source: VN Engineers

Sightlines along Cove Road at CT-156 (Hamburg Road). Source: VN Engineers

Lyme Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-156 (Hamburg Rd) at Marvin Cemetery	Missing signage	Consider adding advance warning signage to alert motorists of potential pedestrians at Marvin Cemetery	Low
	Speeding	Consider the installation of dynamic speed feedback signs near the cemetery	Low
		Consider the implementation of high visibility enforcement near the cemetery.	Low-Medium
	Structurally deficient retaining wall	Consider addressing the structural deficiency of the wall, where the stones sometimes leave debris in the roadway	Medium
CT-156 (Hamburg Rd), in the vicinity of Cove Road	Limited sight distance	Consider trimming excess vegetation on CT-156 (Hamburg Rd) to provide drivers at the intersections with Cove Road with better sightlines	Low
	Signage placement	Consider moving the Side Road Right Up advance warning sign further north to provide additional warning to motorists on CT-156 (Hamburg Rd)	Low
	Structurally deficient retaining wall	Consider addressing the structural deficiency of the retaining wall that is close to the CT-156 (Hamburg Road) travel lane	Medium
Townwide	Limited sight distance	Consider trimming vegetation on state and local roads throughout, particularly dead trees that the Town noted as potential hazards and vegetation overgrowth that impacts sightlines	Low
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
	Pedestrian mobility	Consider the installation of sidewalks along corridors with high pedestrian volumes, as identified by the Town	Medium-High

TOWN OF MIDDLEFIELD

2020 Population Estimate: 4,428

Area: 12.7 square miles

Population Density: 349 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 54,640,504

Latest (2016) VMT per Capita: 12,340

Setting: Rural

Town and Regional Representatives: Edward Bailey (First Selectman), Jason Wickham (Highway Foreman), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: CT-66 (Meriden Road) and CT-147 (Baileyville Road); CT-66 (Meriden Road) and Higby Road/Jackson Hill Road

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 5

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 103

CT-147 (Baileyville Road. Source: VN Engineers

Overview

Middlefield is a small town located in Middlesex County bordered by Middletown to the north and east, Meriden and Wallingford to the west, and Wallingford and Durham to the south. The Town's main thoroughfares are CT-66, CT-147, and CT-157.

Middlefield Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	1	0	0	0	0
Suspected Serious Injury (A)	0	1	0	0	1
Suspected Minor Injury (B)	8	14	12	11	9
Possible Injury (C)	11	7	8	8	12
Total Injury Crashes	20	22	20	19	22

Town's Input

Fatal Crashes from 2015-2019

- **CT-147 (Baileyville Road)** - Young driver, roadway departure, single vehicle fatal crash.

CT-66 (Meriden Road) and CT-147 (Baileyville Road)

This signalized T-intersection has a high-frequency of crashes and speeding along CT-66 (Meriden Road) is of particular concern to the Town. As a result of roadway geometry, the eastbound CT-66 (Meriden Road) approach has a higher propensity for speeding. "Reduce your speed" signs and advance intersection warning signs are already in place along CT-66 (Meriden Road), but the Town stated that these are not adequate. Specifically, there is an eastbound advance intersection warning sign with flashing beacons to warn traffic of the upcoming stop condition ahead. The highway foreman suggested that this is better than the continual flashing signal ahead option that is used at CT-66 (Meriden Road) and Higby Road/Jackson Hill Road. The signal heads need enhancement due to travel speeds and the transition of CT-66 (Meriden Road) from a highway to a controlled roadway. The Town noted that traffic signal retroreflective backplates and 12" LED lenses on the signal heads could enhance visibility.

In addition, the Town is concerned that if power goes out at this signal with no backup generator, there is the potential for a serious crash. During previous discussions with CTDOT, there was no agreement to rectify this issue, but the Town wants to pursue this again because of the danger to motorists' safety. The Town noted that electrical power outages have contributed to crashes at other signalized intersections along CT-66 (Meriden Road).

CT-66 (Meriden Road) and Higby Road/Jackson Hill Road

This four-way signalized intersection has a high frequency of crashes and is the site of a fatal crash prior to the study period. The advance warning signs with flashing beacons at this intersection flashes consistently during all signal phases, which is inconsistent with the flashing beacons on CT-66 (Meriden Road) at CT-147 (Baileyville Road). CTDOT installed these at the Town's request, though the Town is responsible for the electricity costs.

CT-66 (Meriden Road) and CT-217 (Ballfall Road)

This signalized T-intersection has a few crashes, though the sight distance is adequate. The Town noted that driver behavior is the contributing factor to these crashes. The signal is on a separate circuit from the signal systems to the west on CT-66 (Meriden Road) and loses power less frequently.

CT-147 (Baileyville Road) south of Rosemary Lane

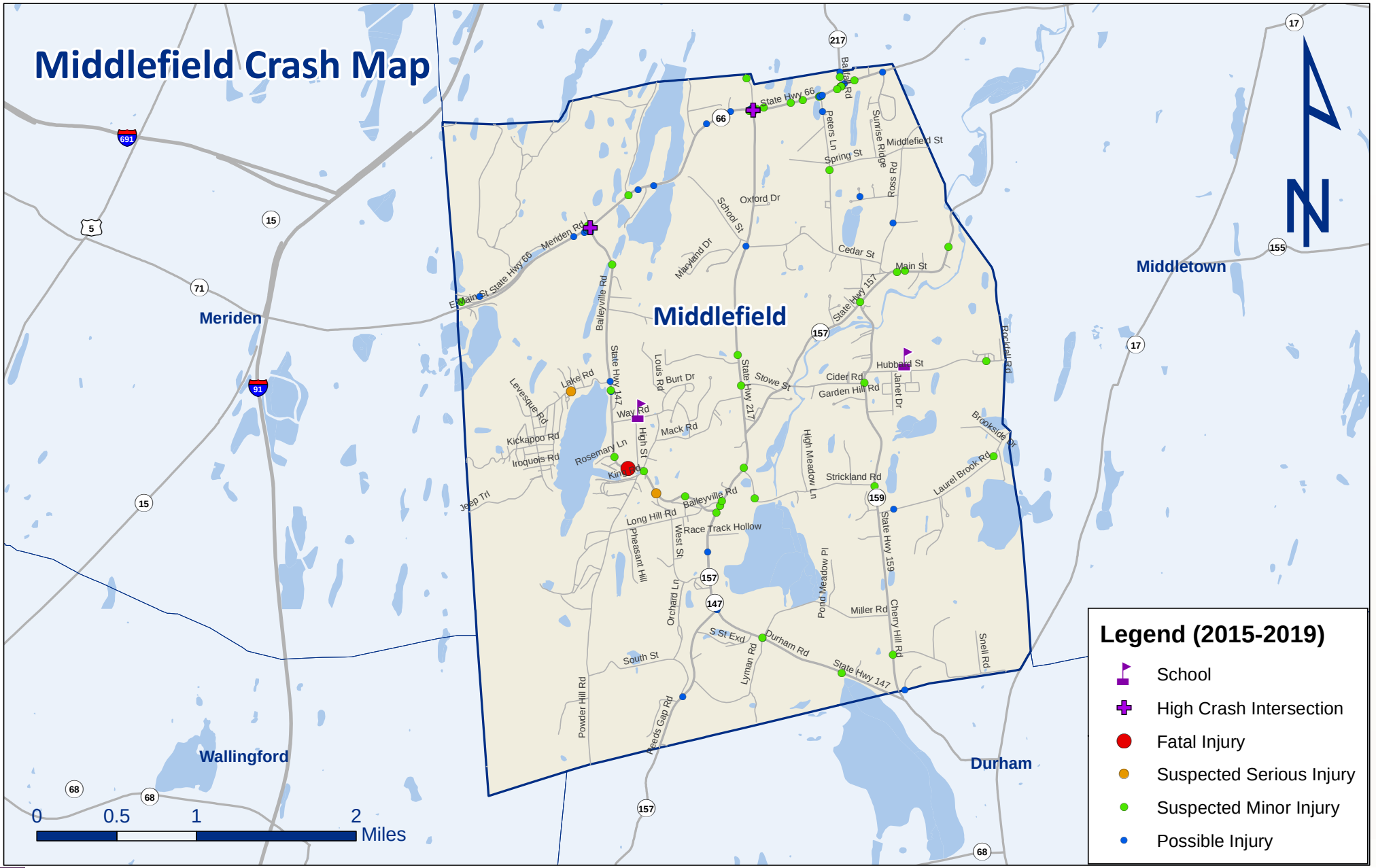
This corridor has a narrow cross section and a significant reverse curve along CT-147 (Baileyville Road), with advance curve warning and chevron signs in place. The Town noted that crashes along this corridor are speed -related and the fatal roadway departure crash that occurred during the study period through the horizontal curve was also related to speed. The Town noted that there is a pedestrian crossing sign within the reverse curve that impedes visibility of other signs and contributes to sign clutter.

CT-147 (Baileyville Road) and CT-157 (Main Street)

This is a split, stop-controlled intersection, with the southern leg of CT-147 (Baileyville Road) being one-way egress to CT-157 (Main Street) and the northern leg being one-way ingress from CT-157 (Main Street) with a small median. Sightlines are compromised at the intersection due to vegetation and physical buildout. The Town noted that heavy truck traffic, driver confusion, and wrong way travel are concerns due to the non-traditional intersection layout. Sign clutter may also contribute to driver confusion.

Pedestrians and Bicyclists

There are currently no sidewalks, and the Town did not receive money from the Connecticut Community Connectivity Grant Program (CCGP) application. Pedestrian crossings were updated by CTDOT with signage and pavement markings, which were installed at parks and several schools. The Town completed a town center plan in the vicinity of CT-157 (Main Street) and Jackson Hill Road and is identifying potential connectivity opportunities. Bicyclist activity is higher than pedestrian activity. Jackson Hill Road between CT-66 (Meriden Road) and Cedar Street is a safety concern due to high bicycle ridership, coupled with the narrow roadway cross section. Bicyclists travel on Jackson Hill Road to connect to Lyman Orchards, Durham, and the shoreline. The Town is applying for LoCIP funds to make improvements, including adding shoulders, on Jackson Hill Road.


Middlefield Crash Map
Middlefield
Meriden
Middletown
Wallingford
Durham
Legend (2015-2019)
School
High Crash Intersection
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0 0.5 1 2 Miles
N
State Hwy 66
Meriden Rd
Main St
Cedar St
Oxford Dr
Spring St
Middlefield St
Sunrise Ridge Rd
Ross Rd
Peters Ln
Baileyville Rd
State Hwy 157
Rockfall Rd
Hubbard St
Cider Rd
Garden Hill Rd
Janet Dr
Brookside Dr
Laurel Brook Rd
Strickland Rd
High Meadow Ln
State Hwy 217
Stowe St
Louis Rd
Burt Dr
State Hwy 147
Lake Rd
Levesque Rd
Way Rd
Mack Rd
High St
Rosemary Ln
Kickapoo Rd
Iroquois Rd
Jeep Trl
Long Hill Rd
Race Track Hollow
Pheasant Hill
West St
Orchard Ln
Pond Meadow Pl
State Hwy 159
Miller Rd
Cherry Hill Rd
Snell Rd
Durham Rd
S St Exd
South St
Lyman Rd
Reeds Gap Rd
Powder Hill Rd
Eastern Blvd
Maryland Dr
School St

Field Site Inventory

CT-66 (Meriden Road) and CT-147 (Baileyville Road)

This is a signalized four-way intersection, with significant vertical grade changes along the CT-66 (Meriden Road) approaches to CT-147 (Baileyville Road). The speed on CT-66 (Meriden Road) is posted at 40 mph, but motorists traveling eastbound, having just exited a limited access highway, tend to travel faster. CT-66 (Meriden Road) is undivided with four travel lanes, two lanes in each direction. Centerline rumble strips help mitigate the narrow divide between the two directions of traffic. At the intersection, eastbound and westbound approaches have exclusive left-turn lanes and eastbound has an exclusive right-turn lane at the signal. CT-147 has an exclusive left-turn lane and a through/right -turn lane for egress and one through lane for ingress. A driveway to Guida's restaurant is located on the north side of the junction.

There is an advanced detection system for eastbound motorists warning them to stop when flashing stop ahead. This is in addition to the expressway ends reduce speed advisory signs positioned at the terminus of I-691 and the beginning of CT-66 (Meriden Road).

Recommendations:

- Consider installing traffic signal retroreflective backplates for all approaches at the intersection to enhance visibility.
- Consider installing oversized lenses on all signal heads at the intersection to enhance visibility.
- Consider installing solar backup due to frequent power outages at this intersection.
- Consider the installation of dynamic speed feedback signs in advance of the intersection.
- Consider the installation of optical speed bars, particularly along the eastbound direction.
- Consider the implementation of high visibility enforcement near the intersection.

CT-66 (Meriden Road) looking east at CT-147 (Baileyville Road). Source: VN Engineers

When flashing stop ahead sign on CT-66 (Meriden Road) looking east. Source: VN Engineers

Field Site Inventory

CT-66 (Meriden Road) and Higby Road/Jackson Hill Road

This is a signalized four-way intersection along a vertical grade change. The CT-66 (Meriden Road) eastbound approach has limited sight distance due to the horizontal curvature to the west of the signal and potential for speeding due to the downgrade. The westbound approach on CT-66 (Meriden Road) has adequate sight distance and the approach is along an upgrade. There is an intersection ahead sign with flashing beacons that flash during all signal phases and is not part of a detection system, like on the CT-66 (Meriden Road) approach to CT-147 (Baileyville Road).

Both approaches on CT-66 (Meriden Road) have two through lanes and one exclusive left-turn lane. Jackson Hill Road and Higby Road both have one exclusive left-turn lane and one through/right-turn lane.

Recommendations:

- Consider installing traffic signal retroreflective backplates for all approaches at the intersection to enhance visibility.
- Consider installing 12 inch LED lenses on all signal heads at the intersection to enhance visibility.
- Consider replacing the current flashing beacons system with a detection system that only flashes to warn traffic of the upcoming stop condition ahead.
- Consider the installation of dynamic speed feedback signs in advance of the intersection.
- Consider the implementation of high visibility enforcement near the intersection.

CT-66 (Meriden Road) and Higby Road/Jackson Hill Road looking east.
Source: VN Engineers

Intersection ahead sign with flashing beacons on CT-66 (Meriden Road).
Source: VN Engineers

Middlefield Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-66 (Meriden Rd) and CT-147 (Baileyville Rd)	Signal operations	Consider installing battery backup due to frequent power outages at this intersection	Low
	Signal visibility	Consider installing traffic signal retroreflective backplates for all approaches at the intersection	Low-Medium
		Consider installing 12 inch LED lenses on all signal heads at the intersection	Low
	Speeding	Consider the installation of dynamic speed feedback signs in advance of the intersection	Low
		Consider the installation of optical speed bars, particularly along the eastbound direction	Low
		Consider the implementation of high visibility enforcement near the intersection	Low-Medium
CT-66 (Meriden Rd) and Higby Rd/Jackson Hill Rd	Signal visibility	Consider installing traffic signal retroreflective backplates for all approaches at the intersection	Low-Medium
		Consider installing oversized LED lenses on all signal heads at the intersection	Low
	Speeding	Consider the installation of dynamic speed feedback signs in advance of the intersection	Low
		Consider the implementation of high visibility enforcement near the intersection	Low-Medium
	Signal operations	Consider replacing the current flashing beacons systems with a detection system that only flashes to warn traffic of the upcoming stop condition ahead	Medium
CT-147 (Baileyville Rd) south of Rosemary Ln	Roadway curvature signage	Consider relocating the pedestrian crossing sign to reduce clutter and consider if this sign is needed	Low
		Consider investigating the placement and spacing of chevron signs	Low
		Consider the implementation of advisory speed signs in advance of the reverse curve	Low
	Roadway curvature lane departures	Consider the installation of centerline rumble strips along CT-147 (Baileyville Rd)	Low

CITY OF MIDDLETOWN

2020 Population Estimate: 49,855

Area: 41.0 square miles

Population Density: 1,216 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 486,196,604

Latest (2016) VMT per Capita: 9,752

Setting: Urban

City and Regional Representatives: Benjamin Florsheim (Mayor), Christopher Holden (Public Works), Bobby Peterson (Mayor's Chief of Staff), Richard Davis (Police Department), Michael Inglis (Police Department), Peter Botsacos (Police Department), Joseph Samolis (Director of Planning, Conservation, and Development), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: CT-66 (Washington Street) from George Street to CT-3 (Newfield Street)/Vine Street; CT-3 (Newfield Street) from Tuttle Road to Westfield Street; CT-17 (South Main Street) from Highland Avenue to CT-17/Loveland Street; Main Street from North Main Street to Frisbie Street

Data Identified High Crash Intersections: CT-17 (South Main Street) and Brush Hill Road; Eastern Drive and Silver Street; CT-66 (Washington Street) and Plaza Drive; CT-66 (Washington Street) and CT-157 (West Street)/Bernie O'Rourke Drive; CT-66 (Washington Street) and Private Driveway near 500 CT-66 (Washington Street); CT-66 (Washington Street) and CT-3 (Newfield Street)/Vine Street; CT-66 (Washington Street) and Park Place/Veterans Way; CT-66 (Washington Street) and High Street; CT-66 (Washington Street) and Pearl Street; CT-66 (Washington Street) and CT-66 (Main Street); Washington Street and DeKoven Drive/CT-9 (Chester Bowles Highway) Ramps; CT-66 (Main Street) and Rapallo Avenue; CT-17 (St. John's Square) and CT-9 (Chester Bowles Highway); Miller Street and CT-9 (Chester Bowles Highway)

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 97

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 1,082

CT-66 (Washington Street). Source: VN Engineers

Overview

Middletown is a city located in Middlesex County, in the central part of the state, bordered by Berlin, Cromwell, and Portland to the north, East Hampton to the east, Berlin, Meriden, and Middlefield to the west, and Middlefield, Durham, and Haddam to the south. The City's main thoroughfares are I-91, CT-3, CT-9, CT-17, CT-66, CT-154, CT-155, CT-157, CT-147, CT-217, and CT-410.

Middletown Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	2	4	0	1	2
Suspected Serious Injury (A)	11	12	14	16	13
Suspected Minor Injury (B)	86	97	96	101	100
Possible Injury (C)	95	124	90	110	108
Total Injury Crashes	194	237	200	228	223

City's Input

Fatal Crashes:

- **CT-3 (Newfield Street)** - Angle fatal crash.
- **CT-3 (Newfield Street** - Pedestrian dark lighted midblock fatal crash.
- **CT-3 (Newfield Street) and Fisher Road -** Front-to-rear fatal crash.
- **CT-17 (South Main Street)** - Pedestrian midblock fatal crash.
- **Fowler Ave** - Pedestrian fatal crash at driveway access.
- **CT-17 (South Main Street) and Acorn Drive** - Heavy vehicle fatal crash.
- **CT-17 (South Main Street) and Coleman Road** - Intersection angle fatal crash.
- **Chamberlain Road** - Speeding, roadway departure fatal crash.
- **Miner Street** - Substance-impaired front-to-front fatal crash.

Top Crash Locations

- **CT-3 (Newfield Street) between Rose Circle and Westfield Street** - Short segment in front of Newfield Towers Apartments.
- **CT-9/CT-17 (Chester Bowles Highway) between CT-17 (St Johns Square) and CT-545 (Washington Street)**.
- **CT-17 (South Main Street) between Pinewood Terrace and Ward Street** - Commercial area with high curb cuts, narrow roadway cross section.
- **CT-3 (Newfield Street) between La Rosa Lane and Congdon Street** - La Rosa Lane leads to Middletown High School and Keigwin Middle School, which may be school-related.
- **CT-66 (Washington Street) between Computer Tune & Lube and McDonald's Entrance.**
- **CT-66 (Washington Street) between CT-157 (West Street) and Sunoco Gas Station**.
- **Main Street between CT-66/CT-545 (Washington Street) and Court Street**.

CT-66 (Washington Street) between CT-3 (Newfield Street)/Vine Street and Main Street

This corridor has additional signalized intersections aside from the start and end points, including at Park Place/Veterans Way, High Street, Pearl Street, and Broad Street. There are a series of crashes within this corridor, likely as a result of limited visibility and vertical curvature on CT-66 (Washington Street). The City noted that pedestrian safety is a concern along this corridor, specifically at the location of a pedestrian fatality at the intersection of CT-66 (Washington Street) and High Street.

CT-66 (Washington Street) and Broad Street

This three-way signalized intersection has crosswalks across all approaches, including at the crest of the vertical curve. All crosswalks have pedestrian signal features and amenities.

CT-66 (Washington Street)

Throughout this corridor, there is a lack of signal coordination and traffic congestion. The City also noted that there are no left-turn lanes at the CT-66 (Washington Street) approaches to both High Street and Broad Street.

CT-66 (Washington Street) and CT-3 (Newfield Street)/Vine Street

New crosswalks are being installed at this intersection, though there is an evaluation to determine if a fourth leg of crosswalk should be added across Vine Street. The City stated that there are pedestrian connectivity concerns along eastbound CT-66 (Washington Street), as a result of lacking sidewalks.

CT-3 (Newfield Street)

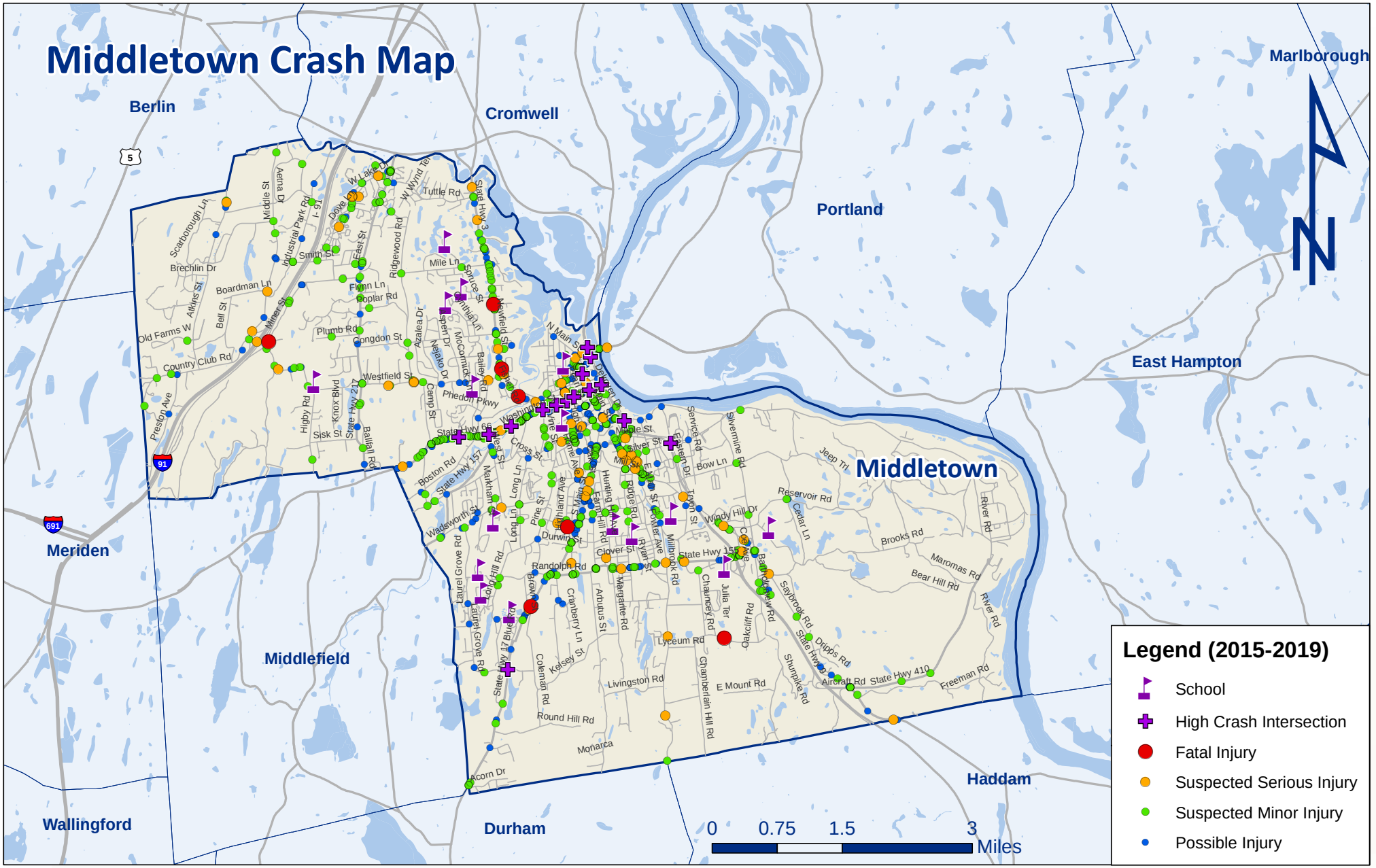
The corridor has one lane in each direction, with occasional turn lanes and a speed limit ranging between 35 and 40 mph. CT-3 (Newfield Street) has issues with speeding and high volumes of traffic. There is a high frequency of crashes in the vicinity of Rose Circle, including a series of angle and motorcycle crashes with high turning movements, as well as a fatality in front of the Newfield Tower Apartments. Though there is a crosswalk directly in front of the apartment complex to link to the convenience store, the City noted that the installation and use of rectangular rapid flashing beacons (RRFBs) could be investigated. Centerline rumble strips were previously installed along this corridor.

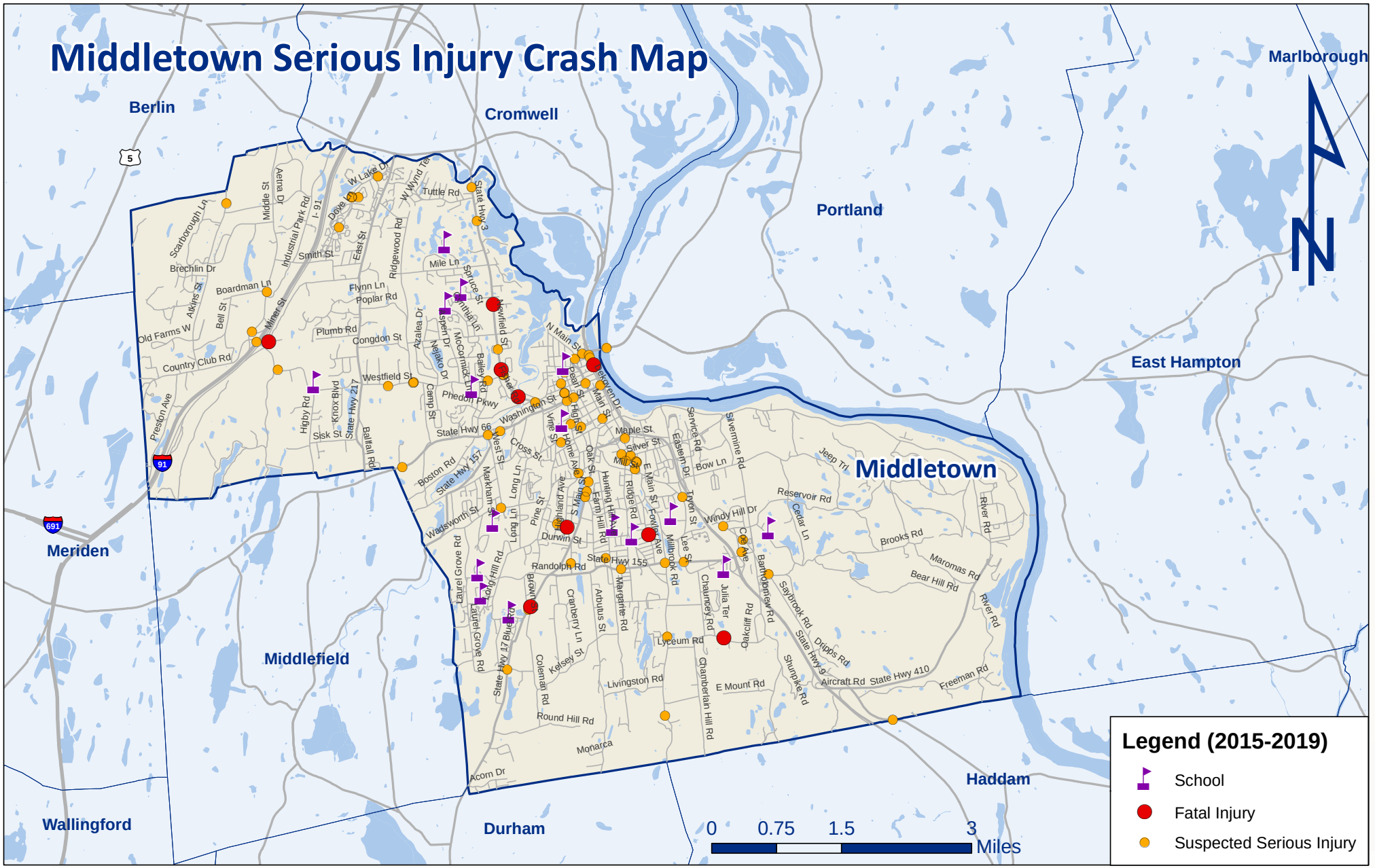
Main Street

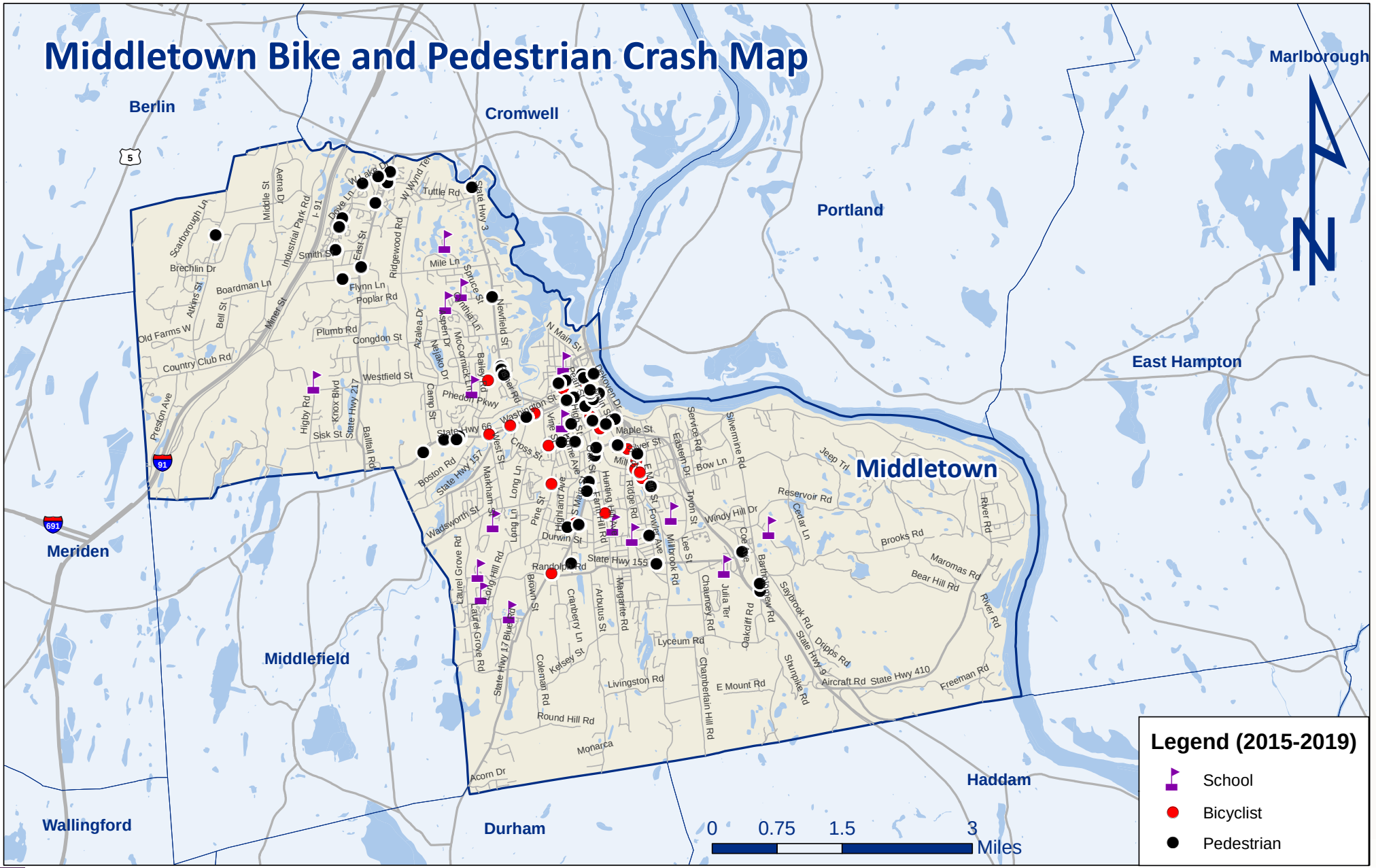
This corridor in downtown Middletown has a high number of both vehicular and pedestrian crashes, with significant amounts of pedestrian jaywalking. The vehicular traffic volume is high, though speeding is not an issue because of the congestion. The City stated that bump outs along Main Street have been well received.

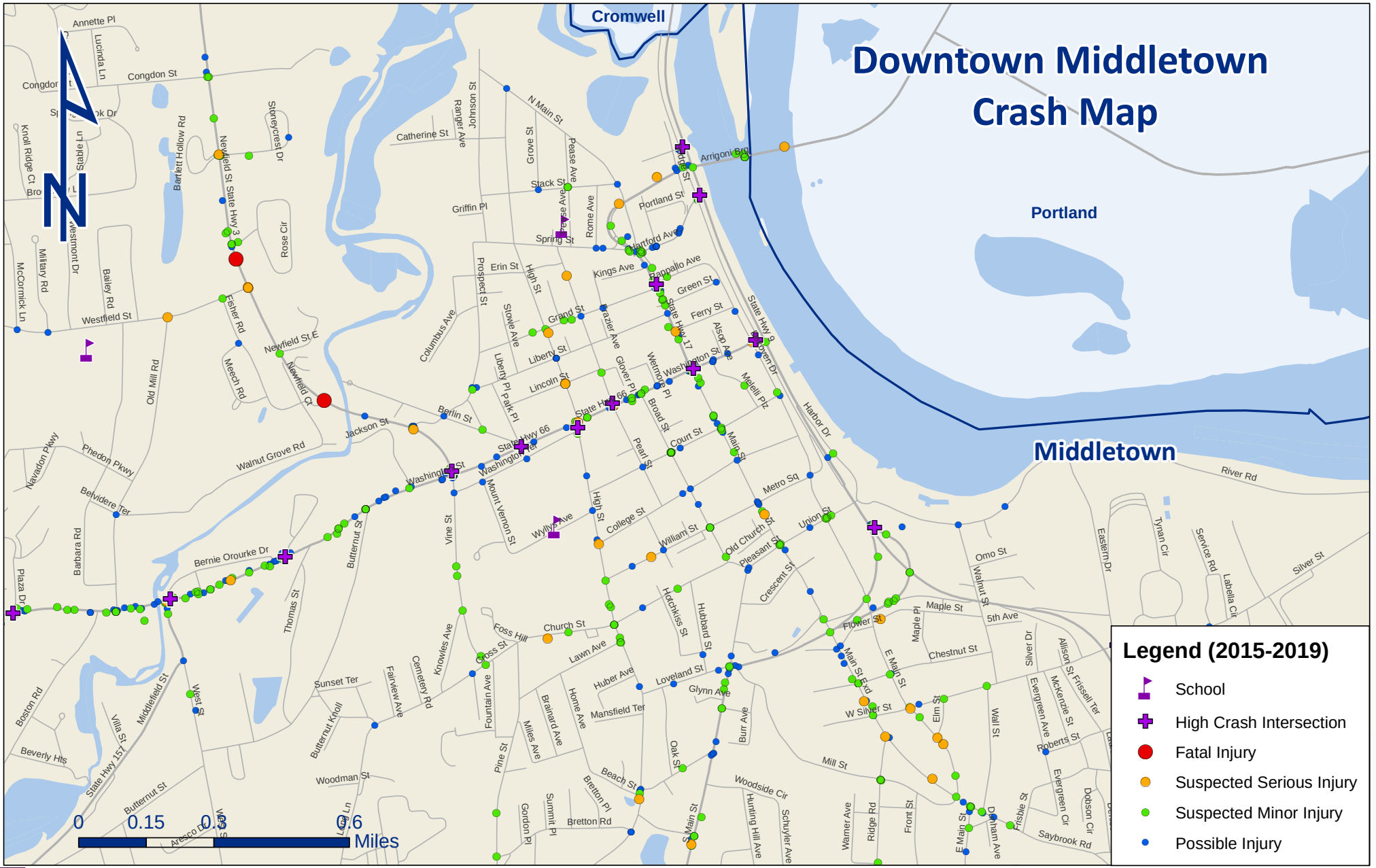
Speeding

In an effort to reduce speeding through the city, high speed feedback trailers have been placed to discourage this behavior.


Middletown Crash Map
Berlin
Cromwell
Portland
Marlborough
East Hampton
Middletown
Meriden
Middlefield
Wallingford
Durham
Haddam
Legend (2015-2019)
School
High Crash Intersection
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0 0.75 1.5 3 Miles


Middletown Serious Injury Crash Map
Berlin
Cromwell
Portland
Marlborough
East Hampton
Middletown
Meriden
Middlefield
Wallingford
Durham
Haddam
Legend (2015-2019)
School
Fatal Injury
Suspected Serious Injury
0 0.75 1.5 3 Miles


Middletown Bike and Pedestrian Crash Map
Berlin
Cromwell
Portland
Marlborough
East Hampton
Middletown
Meriden
Middlefield
Wallingford
Durham
Haddam
N
0 0.75 1.5 3 Miles
Legend (2015-2019)
School
Bicyclist
Pedestrian


Downtown Middletown
Crash Map
Cromwell
Portland
Middletown
Legend (2015-2019)
School
High Crash Intersection
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0
0.15
0.3
0.6
Miles

Field Site Inventory

CT-3 (Newfield Street) between CT-66 (Washington Street) and Tuttle Road

CT-3 (Newfield Street) is a two-lane roadway, with one lane in each direction, except at the intersection with CT-66 (Washington Street), where southbound CT-3 (Newfield Street) has an exclusive left-turn lane, right-turn lane, and through lane. Shoulder widths vary from approximately two to seven feet. The corridor runs through a mixed-use area, generally with residential homes and apartment complexes on the west side of CT-3 (Newfield Street), while the east side of the corridor generally has businesses and restaurants. The corridor has high traffic volumes and a fair amount of school bus traffic given the nearby Middletown High School, Keigwin Middle School, and Lawrence Elementary School. Despite the high traffic volumes along sections within the corridor, the posted speed limit varying between 35 and 40 mph was exceeded along other sections. There are multiple signalized intersections along this corridor and many of them do not have exclusive left-turn lanes. This could be an issue given the high volume of left-turning traffic. The residential homes on the west side of CT-3 (Newfield Street) have small driveways and may have to back out of their driveway into oncoming traffic in order to leave their homes.
*MIdblock crossings at the Newfield Towers will be removed and not re-installed in the 2021 resurfacing program.

Recommendations:

- Consider adding exclusive left-turn lanes on CT-3 (Newfield Street) at all signalized intersections, where additional right-of-way acquisition is possible.
- Consider completing intermittent sections of sidewalk along CT-3 (Newfield Street).
- Consider the installation of dynamic speed feedback signs.
- Consider the implementation of high visibility enforcement.

CT-3 (Newfield Street) looking south at Tuttle Road. Source: VN Engineers

CT-3 (Newfield Street) looking south at Congdon Street. Source: VN Engineers

Field Site Inventory

CT-66 (Washington Street) between CT-3 (Newfield Street)/Vine Street and Main Street

CT-66 (Washington Street) is a four-lane roadway, with two lanes in each direction and shoulder widths less than two feet. The road serves as a critical collector for traffic going to downtown Middletown and to Wesleyan University. Despite entering the downtown area, there is no parking on either side of CT-66 (Washington Street). Signalized intersections on this road may have additional exclusive turn lanes for right and left turns. Sidewalks and curbs are present on both sides of the road throughout the corridor, with the exception being missing sidewalks between CT-3 (Newfield Street)/Vine Street and High Street, along eastbound CT-66 (Washington Street). All signalized intersections have at least one pedestrian crossing. During this field visit, traffic was observed to back up from one intersection into another along CT-66 (Washington Street).

Recommendations:

- Consider optimizing signal timings and offsets along CT-66 (Washington Street) to minimize queuing between intersections.
- Consider adding exclusive left-turn lanes on CT-66 (Washington Street) at all signalized intersections, where additional right-of-way acquisition is possible, to accommodate peak period traffic demands.
- Consider implementing Watch for Me CT.
- Consider implementing pedestrian hybrid beacons along the CT-66 (Washington Street) corridor.
- Consider completing intermittent sections of sidewalk from at least CT-3 (Newfield Street)/Vine Street to High Street, along eastbound CT-66 (Washington Street).

CT-66 (Washington Street) looking west at Main Street. Source: VN Engineers

CT-66 (Washington Street) looking west at vertical curvature at Pearl Street. Source: VN Engineers

Middletown Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-3 (Newfield St) between CT-66 (Washington St) and Tuttle Rd	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
	Congestion and capacity limitations	Consider adding exclusive left-turn lanes on CT-3 (Newfield St) at all signalized intersections, where additional right-of-way acquisition is possible	Medium-High
	Pedestrian mobility and safety	Consider completing intermittent sections of sidewalk along CT-3 (Newfield St)	Medium-High
CT-66 (Washington St) between CT-3 (Newfield St)/Vine St and Main St	Signal operations	Consider optimizing signal timings and offsets along CT-66 (Washington St) to minimize queuing between intersections	Low
	Pedestrian and bicyclist safety	Consider implementing Watch for Me CT	Low-Medium
		Consider completing intermittent sections of sidewalk from at least CT-3 (Newfield Street)/Vine Street to High Street, along eastbound CT-66 (Washington Street)	Medium-High
		Consider implementing pedestrian hybrid beacons along CT-66 (Washington St) corridor	High
	Congestion and capacity limitations	Consider adding exclusive left turn lanes on CT-66 (Washington St) at all signalized intersections, where additional right-of-way acquisition is possible, to accommodate peak period traffic demands	High
Citywide	Signal visibility	Consider installing traffic signal retroreflective backplates	Low-Medium

TOWN OF OLD LYME

2020 Population Estimate: 7,162

Area: 23.1 square miles

Population Density: 310 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 162,688,234

Latest (2016) VMT per Capita: 22,715

Setting: Suburban

Town and Regional Representatives: Dan Bourret (Planning and Zoning), David Roberge (Emergency Management Director/Fire Marshal)

Data Identified High Crash Corridors: N/A

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 7

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 104

Lyme Street. Source: VN Engineers

Overview

Old Lyme is a coastal town in New London County bordered by Lyme to the north, East Lyme to the east, Old Saybrook to west separated by the Connecticut River, and the Long Island Sound to the south. The Town's main thoroughfares are I-95, US-1, and CT-156.

Old Lyme Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	1	1	1	0	1
Suspected Serious Injury (A)	3	0	1	1	2
Suspected Minor Injury (B)	12	5	8	11	11
Possible Injury (C)	7	8	15	7	9
Total Injury Crashes	23	14	25	19	23

Town's Input

Fatal Crashes from 2015-2019

- **Town Woods Road** - Speed-related, roadway departure fatal crash.
- **US-1 (Boston Post Road) near Hillside Road** - Motorcycle, fatal crash at private driveway.
- **US-1 (Boston Post Road) near Sill Lane** - Pedestrian, horizontal curve, dark-not lighted fatal crash.
- **Mile Creek Road** - Older driver, speeding, lane departure fatal crash.

US-1 (Halls Road/Lyme Street/Boston Post Road)

The US-1 (Boston Post Road) corridor from Boggy Hole Road to Town Woods Road experiences a cluster of crashes, which the Town thinks could be attributed to the high number of curb cuts due to residential driveways and intermittent business access points. The Town also noted that US-1 (Halls Road/Lyme Street/Boston Post Road) experiences congestion because of diverted traffic from crashes on I-95 (Connecticut Turnpike).

Four Mile River Road

Four Mile River Road is a north-south corridor connecting traffic from US-1 (Boston Post Road) to CT-156 (Shore Road). This corridor also includes intersections with I-95 (Connecticut Turnpike) and Four Mile River Road is a common diversion route when there are crashes on I-95 (Connecticut Turnpike).

US-1 (Boston Post Road) and Four Mile River Road

US-1 (Boston Post Road) intersects Four Mile River Road at a T-intersection, with US-1 (Boston Post Road) operating under free flow conditions, while the Four Mile River Road approach has stop control. The Town noted that sight distance is an issue because of horizontal and vertical curvature.

CT-156 (Neck Road/Shore Road)

CT-156 (Neck Road/Shore Road) generally serves as a north-south corridor, with horizontal curvature and operates as a popular route for bicyclists. In addition, there is a cluster of crashes near I-95 (Connecticut Turnpike). This corridor also has a narrow cross section, with little to no shoulders.

CT-156 (Shore Road) and Smith Neck Road/Mile Creek Road

The four-way intersection of CT-156 (Shore Road) and Smith Neck Road/Mile Creek Road has a cluster of crashes. The Town noted that sight distance is limited as vehicles approach the intersection. CT-156 (Shore Road) operates under free flow conditions, while the Smith Neck Road and Mile Creek Road approaches have stop control.

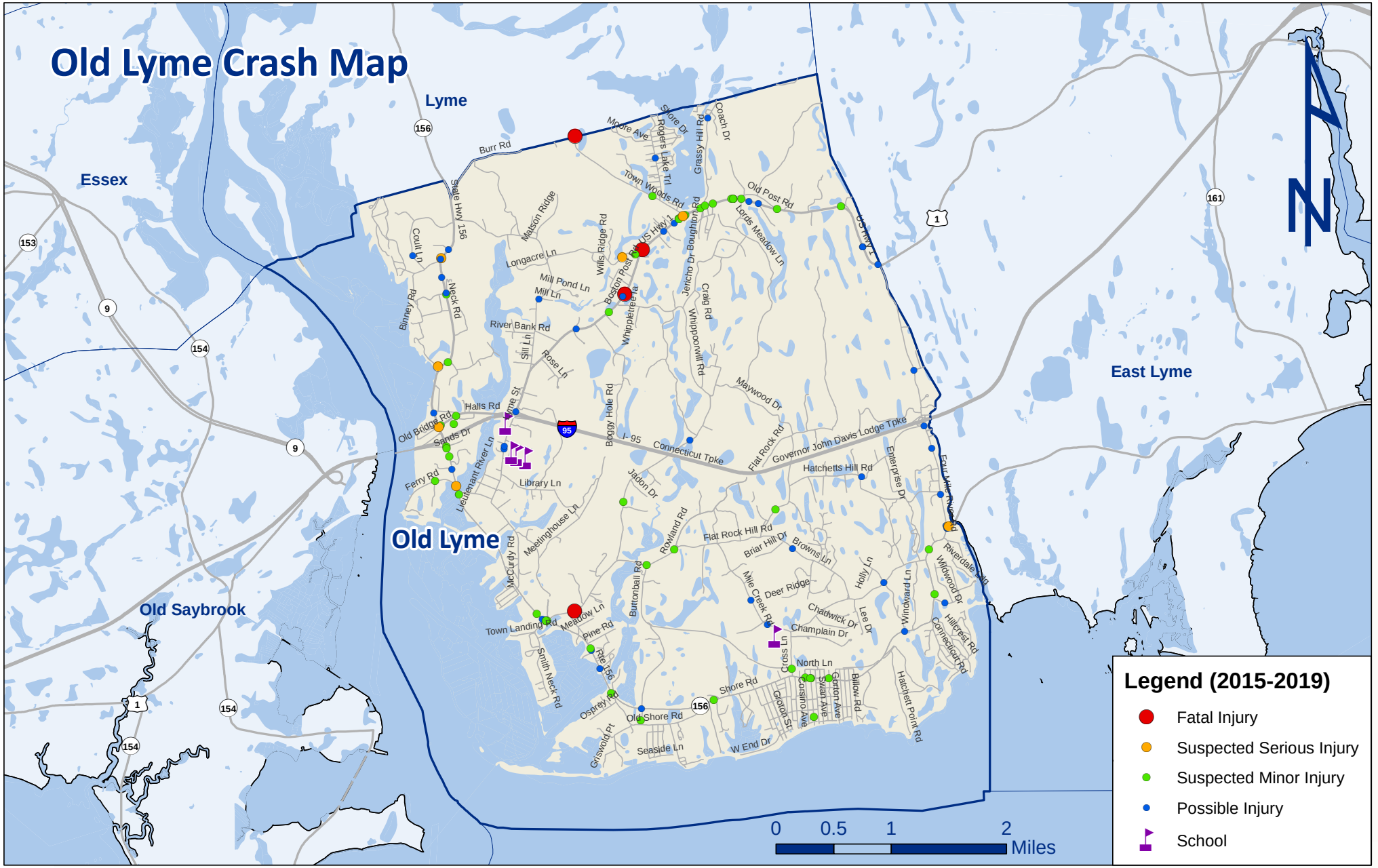
Pedestrians and Bicyclists

The Town of Old Lyme is a popular destination for bicyclists. CTDOT is in the process of installing bike lanes on CT-156 (Shore Road) from Cross Lane to I-95 (Connecticut Turnpike). The Town is also extending thier sidewalk connectivity. A Community Connectivity Grant Program-funded sidewalk project is under way on the northern half of Hartford Ave. from Bocce Lane to Route 156. Sidewalks will also be installed on the north side of CT-156 (Shore Road) from the Old Lyme Police Station west to Cross Lane.

Speeding

The Town noted that high visibility speed enforcement is currently being conducted on Lyme Street, Town Woods Road, and Four Mile River Road.

US-1 (Boston Post Road). Source: VN Engineers


Old Lyme Crash Map
Lyme
Essex
Old Lyme
Old Saybrook
East Lyme
Burr Rd
Moore Ave
Shore Dr
Roger's Lake Trl
Grassy Hill Rd
Coach Dr
Town Woods Rd
Old Post Rd
Lords Meadow Ln
Jericho Dr
Boughton Rd
Craig Rd
Whippoorwill Rd
Maywood Dr
Wills Ridge Rd
Boston Post Rd
US Hwy 1
Matson Ridge
Longacre Ln
Mill Pond Ln
Mill Ln
River Bank Rd
Whippletree Ln
Sill Ln
Rose Ln
Lyme St
Halls Rd
Old Bridge Rd
Sands Dr
Ferry Rd
Lieutenant River Ln
Library Ln
Meetinghouse Ln
McCurdy Rd
Boggy Hole Rd
I- 95
Connecticut Tpke
Governor John Davis Lodge Tpke
Flat Rock Rd
Hatchetts Hill Rd
Enterprise Dr
Four Mile River Rd
Riverdale Rd
Jadon Dr
Rowland Rd
Flat Rock Hill Rd
Briar Hill Dr
Browns Ln
Holly Ln
Windward Ln
Widwood Dr
Hillcrest Rd
Connecticut Rd
Deer Ridge
Mile Creek Rd
Chadwick Dr
Champlain Dr
Lee Dr
Cross Ln
North Ln
Buttonball Rd
Meadow Ln
Town Landing Rd
Pine Rd
Rte 156
Smith Neck Rd
Osprey Rd
Griswold Pt
Old Shore Rd
Seaside Ln
W End Dr
Shore Rd
Glotzin St
Cosino Ave
Swan Ave
Orton Ave
Billow Rd
Hatchett Point Rd
Legend (2015-2019)
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
School
0 0.5 1 2
Miles

Field Site Inventory

US-1 (Boston Post Road) from Boggy Hole Road to Town Woods Road

US-1 (Boston Post Road) is a two-lane roadway, with one travel lane in each direction and shoulders varying from two to four feet wide. The road is located in a mixed-use area of residences, commercial businesses, and restaurants. There are a high number of curb cuts for driveway access and egress and side streets under stop control. The speed limit is posted at 45 mph. The Coffee's Country Market at 169 Boston Post Road is located on the south side, with an excessively wide access and egress. Just east of the Coffee's Country Market, there are midblock pedestrian crossings linked to Rogers Lake on the north side of US-1. However, there are no sidewalks. There are advance pedestrian crossing signs at the crossings, but they lack MUTCD-compliant retro-reflectivity.

Recommendations:

- Consider replacing the existing signs with MUTCD-compliant retroreflective signing, particularly at the pedestrian crossings.
- Consider collaborating with the Coffee's Country Market to narrow access and egress.
- Consider the installation of dynamic speed feedback signs.
- Consider the implementation of high visibility enforcement.
- Consider installing a non-vehicular pedestrian warning sign.

US-1 (Boston Post Road) at Coffee's Country Market looking east. Source: VN Engineers

US-1 (Boston Post Road) looking east. Source: VN Engineers

Field Site Inventory

CT-156 (Shore Road) and Smith Neck Road/Mile Creek Road

The intersection of CT-156 (Shore Road) and Smith Neck Road/Mile Creek Road is an unsignalized intersection, with Smith Neck Road and Mile Creek Road having single lane approaches under stop control. CT-156 (Shore Road) consists of a single lane and four foot shoulders in each direction, and a posted speed limit of 45 mph. The CT-156 (Shore Road) eastbound approach to the intersection consists of both vertical and horizontal curves, impacting sight distances to and from the intersection. Sight lines from Mile Creek Road are significantly impacted to the west due to an adjacent building, coupled with the CT-156 (Shore Road) horizontal curvature. Sight lines from Smith Neck Road are impacted by both the CT-156 (Shore Road) horizontal and vertical curves to the west, as well as overgrown vegetation to the east. A commercial private driveway and a marked pedestrian crosswalk across CT-156 (Shore Road), immediately to the west of the intersection, further complicates the intersection. Intersection and pedestrian advanced warning signs are installed along both the CT-156 (Shore Road) westbound and eastbound approaches to the intersection.

Recommendations:

- Consider measures to increase sight distances from the side streets and reduce travel speeds along CT-156 (Shore Road), including reducing CT-156 (Shore Road) roadway cross section to permit the Mile Creek Road stop bar and sign to be moved forward to increase sight lines to the west.
- Consider removing vegetation overgrowth on the southeast corner of the intersection to increase sight lines to the east.
- Consider closing the private commercial driveway on CT-156 (Shore Road) with access/egress from the existing driveway on Johnny Cake Hill Road.

CT-156 (Shore Road) and Smith Neck Road/Mile Creek Road looking west.
Source: VN Engineers

CT-156 (Shore Road) and Smith Neck Road/Mile Creek Road looking east.
Source: VN Engineers

Old Lyme Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
US-1 (Boston Post Rd) from Boggy Hole Rd to Town Woods Rd	Replace signage	Consider replacing the existing signs with MUTCD-compliant retroreflective signing, particularly at the pedestrian crossings	Low
	Pedestrian safety	Consider installing non-vehicular pedestrian warning signs on US-1	Low
	Access and egress	Consider collaborating with the Coffee's Country Market to narrow access and egress	Low-Medium
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
CT-156 (Shore Rd) and Smith Neck Rd/Mile Creek Rd	Limited sight distance	Consider removing vegetation overgrowth on the southeast corner of the intersection to increase sight lines to the east	Low
		Consider measures to increase sight distances from the side streets and reduce travel speeds along CT-156 (Shore Rd), including reducing the CT-156 (Shore Rd) roadway cross section to permit the Mile Creek Road stop bar and sign to be moved forward to increase sight lines to the west	Low-Medium
	Access/egress at private driveway	Consider closing the private commercial driveway on CT-156 (Shore Rd) with access/egress from the existing driveway on Johnny Cake Hill Rd	Low-Medium
US-1 (Boston Post Rd) and Four Mile River Rd	Roadway curvature	Consider the installation of centerline rumble strips along US-1 (Boston Post Rd), in the vicinity of Four Mile River Rd	Low
		Consider the installation of shoulder rumble strips along US-1 (Boston Post Rd), in the vicinity of Four Mile River Rd	Low

TOWN OF OLD SAYBROOK

2020 Population Estimate: 9,212

Area: 15.0 square miles

Population Density: 614 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 176,816,348

Latest (2016) VMT per Capita: 19,194

Setting: Rural/Suburban

Town and Regional Representatives: Chief Michael Spera (Police Department) and Carl Fortuna (First Selectman)

Data Identified High Crash Corridors: US-1 (Boston Post Road) from Vista Terrace to just east of Old Boston Post Road, at 1090 Boston Post Road; US-1 (Boston Post Road) from CT-154 (Main Street)/North Main Street to CT-154 (Middlesex Avenue)/Mill Rock Road East

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 26

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 200

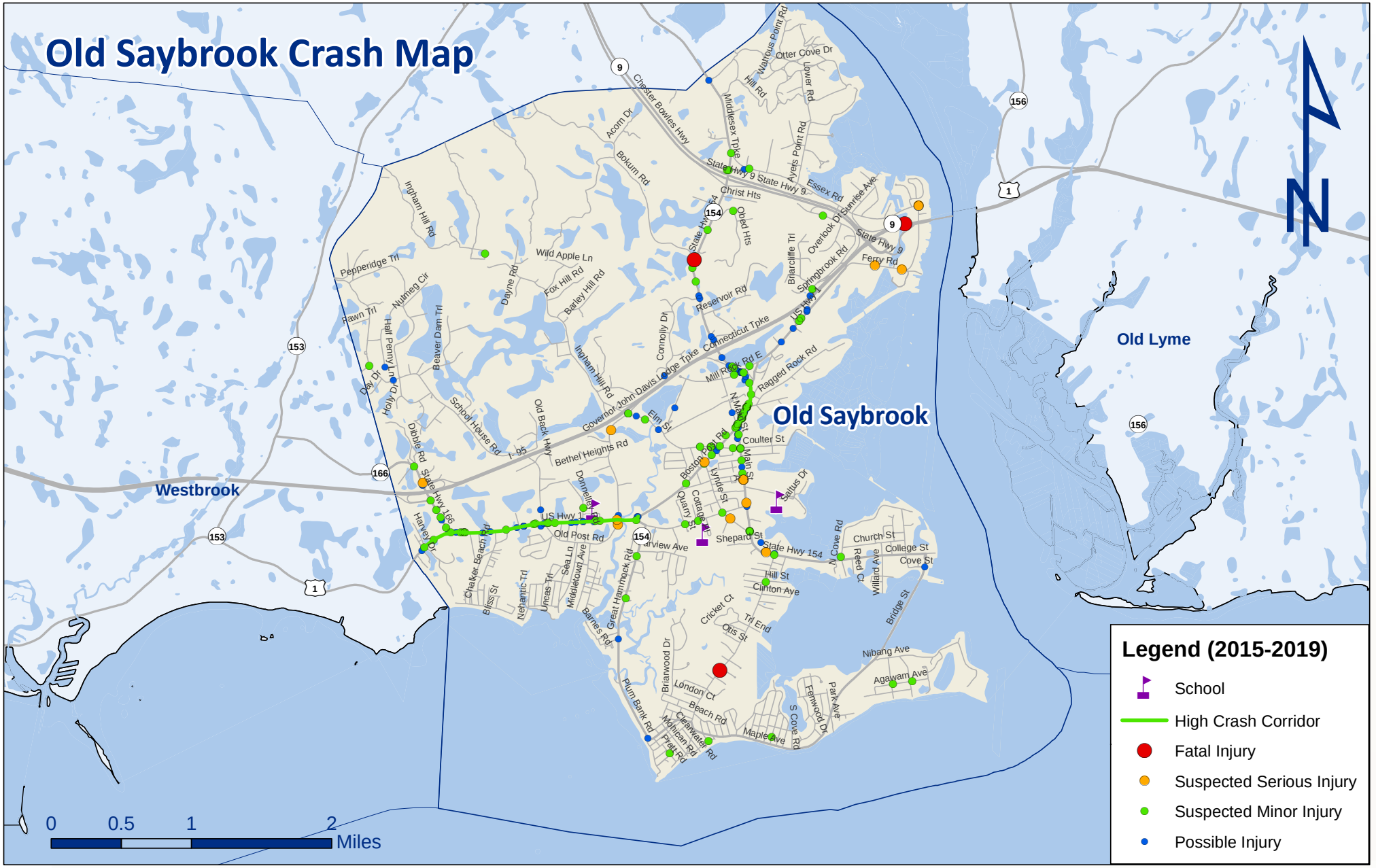
Mill Rock Road East. Source: VN Engineers

Overview

Old Saybrook is a town in Middlesex County bordered by Essex to the north, Old Lyme to the east, separated by the Connecticut River, Westbrook to the west, and the Long Island Sound to the south. The Town's main thoroughfares are I-95, US-1, CT-9, CT-154, and CT-166.

Old Saybrook Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	0	2	0	0	1
Suspected Serious Injury (A)	1	7	4	2	0
Suspected Minor Injury (B)	16	19	24	18	15
Possible Injury (C)	14	20	23	22	12
Total Injury Crashes	31	48	51	42	28


Old Saybrook Crash Map
Old Saybrook
Westbrook
Old Lyme
Legend (2015-2019)
School
High Crash Corridor
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury
0 0.5 1 2
Miles
N
Boston Post Rd
Main St
Elm St
Bethel Heights Rd
Old Post Rd
Shepard St
Ragged Rock Rd
Mill Rock Rd E
Reservoir Rd
Connecticut Tpke
Governor John Davis Lodge Tpke
Middlesex Tpke
State Hwy 9
Ferry Rd
Springbrook Rd
Essex Rd
Sunrise Ave
Overlook Dr
Briarcliffe Trl
Ayers Point Rd
Otter Cove Dr
Lower Rd
Hill Rd
Christ Hts
Obed Hts
Acorn Dr
Bokum Rd
Chester Bowles Hwy
Ingham Hill Rd
Pepperidge Trl
Nutmeg Cir
Rawn Trl
Half Penny Ln
Holly Dr
Day Dr
Beaver Dam Trl
Dayne Rd
Wild Apple Ln
Fox Hill Rd
Barley Hill Rd
Connolly Dr
School House Rd
Old Back Hwy
Dibble Rd
State Hwy 166
Harvey Dr
Donnelly Rd
US Hwy 1
Quarry Ln
Cottage Pl
Lynde St
Sailus Dr
Church St
College St
Cove St
N Cove Rd
Reed Ct
Willard Ave
Bridge St
Hill St
Clinton Ave
State Hwy 154
Cricket Ct
Trl End
Otis St
Nibang Ave
Agawam Ave
Park Ave
Fenwood Dr
S Cove Rd
Maple Ave
Beach Rd
London Ct
Briarwood Dr
Plum Bank Rd
Mohican Rd
Pratt Rd
Clearwater Rd
Great Hammock Rd
Barnes Rd
Middletown Ave
Sea Ln
Uncas Trl
Nehantic Trl
Bliss St
Chaker Beach Rd
Driftview Ave
I-95
9
154
153
166
1
156

Field Site Inventory

US-1 (Boston Post Road)/CT-154 (Middlesex Avenue) and US-1 (Boston Post Road)/Mill Rock Road East

This intersection is a four-way signalized intersection, which serves as the terminus of I-95 Northbound Exit 67 off-ramp, and as the northern split between US-1 (Boston Post Road) and CT-154 (Middlesex Avenue). The intersection is raised and occurs near the crest of a vertical curve on US-1 (Boston Post Road) and Mill Rock Road East. The north leg of this intersection carries CT-154 (Middlesex Turnpike) and the I-95 Northbound Exit 67 off-ramp. North of this intersection, CT-154 (Middlesex Turnpike) is a two-lane road. The south leg carries overlapping CT-154 (Middlesex Avenue) and US-1 (Boston Post Road), which is a four-lane road. The west leg carries Mill Rock Road East, a two-lane local road. The east leg of the intersection carries US-1 (Boston Post Road), which is a four-lane road.

The north and south legs have a posted speed limit of 40 mph and 30 mph, respectively. While the west leg has a posted speed limit of 25 mph, there is no posted speed limit for the east leg. Motorists exiting I-95 were observed travelling fast and might need additional cues to reduce their speeds.

Shoulders at this intersection average between one and two feet wide, except on Mill Rock Road East, which has no shoulders. There is a crosswalk on the south leg only, and no pedestrian signal head at the southeast corner. The south leg is also the only leg with sidewalks. The intersection is illuminated.

Recommendations:

- Consider installation of exclusive pedestrian phasing and preemption equipment.
- Consider Ambulance and Police vehicles be permitted by statute to utilize the preemption equipment.
- Consider optimizing and coordinating the signal timings.
- Consider installing traffic signal retroreflective backplates at all approaches for increased visibility.
- Consider the installation of dynamic speed feedback signs.
- Consider installing a pedestrian signal head at the southeast corner.

US-1 (Boston Post Road)/CT-154 (Middlesex Avenue) and US-1 (Boston Post Road)/Mill Rock Road East looking west. Source: VN Engineers

Pedestrian Crossing at US-1 (Boston Post Road)/CT-154 (Middlesex Avenue) and US-1 (Boston Post Road)/Mill Rock Road East looking east. Source: VN Engineers

Field Site Inventory

US-1/CT-154 (Boston Post Road) between CT-154 (Main Street)/North Main Street and River Street/Stage Road

The US-1/CT-154 (Boston Post Road) corridor between CT-154 (Main Street)/ North Main Street and River Street/Stage Road is a four-lane urban road. The posted speed limit is 30 mph. The shoulders are approximately one foot wide, and there are sidewalks on both side of the corridor. As this is an urban area, there are multiple businesses, including a gas station, restaurant, and lumber yard, on either side of the road.

There are no left turn bays, nor street parking along this corridor. The intersections with CT-154 (Main Street)/North Main Street and River Street/Stage Road are both four-way, skewed, signalized intersections. The intersection with CT-154 (Main Street)/North Main Street serves as the southern split between CT-154 and US-1 (Boston Post Road); US-1 (Boston Post Road) continues westbound as a four-lane urban road towards Westbrook, while CT-154 (Main Street) continues southbound and transitions to a two-lane urban road towards the shoreline. North Main Street is also a two-lane urban road. This intersection has crosswalks on all legs except the south leg. There are raised islands on the north and south legs to separate opposing traffic. The intersection with River Street/Stage Road has no crosswalks, but does have push-buttons on the northeast and southwest corners. River Street and Stage Road are two-lane urban roads. There is roadway illumination in this area.

Recommendations:

- Consider installation of exclusive pedestrian phasing and preemption equipment to the intersections.
- Consider Ambulance and Police vehicles be permitted by statute to utilize the preemption equipment.
- Consider installing traffic signal retroreflective backplates for all approaches at both intersections.
- Consider a road diet and streetscaping as traffic calming.
- Consider enhanced pedestrian features at both intersections, particularly at the intersection with River St/Stage Rd.

US-1/CT-154 (Boston Post Road) and CT-154 (Main Street/North Main Street) looking north. Source: VN Engineers

US-1/CT-154 (Boston Post Road) and River Street/Stage Road looking east. Source: VN Engineers

Old Saybrook Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
US-1 (Boston Post Rd)/CT-154 (Middlesex Ave) and US-1 (Boston Post Rd)/Mill Rock Rd East	Signal operations	Consider optimizing and coordinating signal timings	Low
	Signal visibility	Consider installing traffic signal retroreflective backplates at all approaches for increased visibility	Low-Medium
	Speeding	Consider the installation of dynamic speed feedback signs	Low
	Pedestrian safety	Consider installing a pedestrian signal head at the south-east corner	Low
		Consider installation of exclusive pedestrian phasing and preemption equipment	Low-Medium
		Consider Ambulance and Police vehicles be permitted by statute to utilize the preemption equipment	Low
US-1/CT-154 (Boston Post Rd) between CT-154 (Main St)/North Main St and River St/Stage Rd	Pedestrian safety	Consider enhanced pedestrian features at both intersections, particularly at the intersection with River St/Stage Rd	Low
		Consider installation of exclusive pedestrian phasing and preemption equipment to the intersections	Low-Medium
		Consider Ambulance and Police vehicles be permitted by statute to utilize the preemption equipment	Low
	Traffic calming	Consider a road diet and streetscaping as traffic calming	Low-Medium
	Congestion and signal visibility	Consider installing traffic signal retroreflective backplates for all approaches at both intersections	Low-Medium

TOWN OF PORTLAND

2020 Population Estimate: 9,781

Area: 23.4 square miles

Population Density: 418 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 67,003,492

Latest (2016) VMT per Capita: 6,850

Setting: Rural/Suburban

Town and Regional Representatives: Susan Bransfield (First Select-woman)

Data Identified High Crash Corridors: Main Street from the Connecticut River/Middletown City Line to Spring Street; CT-66 (Marlborough Street) from Main Street to Johnson Farm Road/Grove Street; CT-66 (Portland-Cobalt Road) from Hubert E. Butler Construction Company (984 Portland-Cobalt Road) to Saint Clements Castle (1931 Portland-Cobalt Road)

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 5

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 210

CT-17A (Main Street). Source: VN Engineers

Overview

Portland is a town in Middlesex County bordered by Glastonbury to the north, East Hampton to the east, Cromwell and Middletown to the west, separated by the Connecticut River, and Middletown to the south, also separated by the Connecticut River. The Town's main thoroughfares are CT-17, CT-17A, and CT-66.

Portland Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	2	2	2	1	0
Suspected Serious Injury (A)	3	6	5	4	4
Suspected Minor Injury (B)	17	20	23	19	23
Possible Injury (C)	14	14	16	20	15
Total Injury Crashes	36	42	46	44	42

Town's Input

Fatal Crashes from 2015-2019

- **CT-17/CT-66 (Main Street)** - Aggressively-driving moped fatal crash.
- **CT-17/CT-66 (Marlborough Street)** - Motorcycle fatal crash.
- **CT-17/CT-66 (Marlborough Street)** - Roadway departure fatal crash.
- **CT-66 (Portland-Cobalt Road)** - Motorcycle fatal crash.
- **CT-66 (Portland-Cobalt Road)** - Roadway departure fatal crash along a horizontal curve.
- **CT-66 (Portland-Cobalt Road)** - Unrestrained older driver and lane departure fatal crash.
- **Woodchoppers Road** - Motorcycle, high speed-related fatal crash.

CT-17A (Main Street) south of Coe Avenue

This downtown area of Portland has experienced a high number of crashes. CT-17A (Main Street) south of Coe Avenue in particular has high ADT, due to Arrigoni Bridge traffic from Middletown and cut through traffic from Glastonbury. This segment also has high turning movements and speeding, as the Town identified the need for traffic calming. The Town noted that the diagonal on-street parking contributes to the congestion and queuing in the downtown area. Future development at the intersection of CT-17/CT-66 (Marlborough Street) will increase traffic in this area.

CT-17A (Main Street) north of Coe Avenue

This segment of CT-17A (Main Street) is more rural than south of Coe Avenue, though the town is still concerned about speeding. The Town also noted that the Gildersleeve School area needs funding from the Connecticut Community Connectivity Grant Program (CCGP) for installation of sidewalks.

CT-66 (Marlborough Street/Portland-Cobalt Road)

This corridor experiences high crash numbers, primarily due to speeding and the roadway having a wide cross section. Six fatal crashes occurred along this corridor between 2015 and 2019, though the Town noted that traffic calming strategies along key sections would improve safety along the corridor. RiverCOG completed a corridor study and identified low level of service at signals, as well as safety concerns at "the ledges" near Saint Clements Castle. "The ledges" is the local name to describe this segment of roadway west of St Clements Castle with rock outcroppings on both sides and vertical and horizontal curvature geometry. There have been several crashes in its vicinity. The Town stated the DOT recently installed LED streetlights, chevron signs, and rumble strips along CT-66 (Portland-Cobalt Road) near "the ledges" to increase driver awareness and reduce crashes.

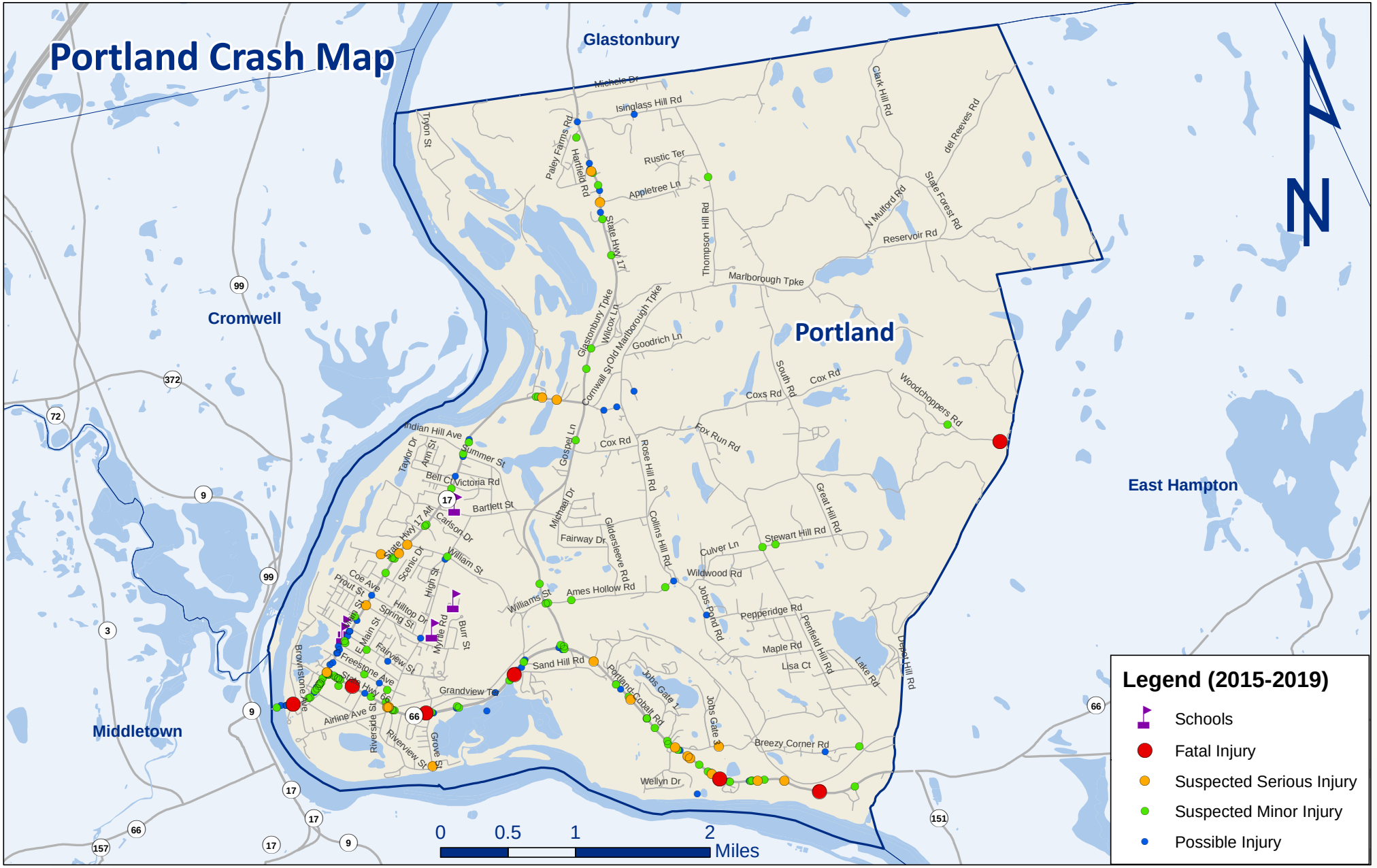
Pedestrians and Bicyclists

The Town noted that funding for sidewalks in the downtown area was approved by bond referendum in 2016. In addition, the Town is using CCGP funds to install sidewalks on CT-17A (Main Street) north and south of the intersection with Fairview Avenue. The Town would also like to add sidewalks along Riverside Street and key sections along CT-66 (Marlborough Street/Portland-Cobalt Road). There is a Complete Streets group in town, comprised of residents only, though the fire department, police department, and DOT personnel review and assist the group in an unofficial capacity. Currently, this group is working to establish a family-friendly bike route.

Speeding

In an effort to reduce speeding, the Town has installed dynamic speed feedback signs along High Street.

CT-17A (Main Street). Source: VN Engineers


Portland Crash Map
Glastonbury
Cromwell
Portland
East Hampton
Middletown
Michele Dr
Isinglass Hill Rd
Tryon St
Paley Farms Rd
Hatfield Rd
Rustic Ter
Appletree Ln
State Hwy 17
Thompson Hill Rd
Clark Hill Rd
del Reeves Rd
State Forest Rd
N Mulford Rd
Reservoir Rd
Marlborough Tpke
Glastonbury Tpke
Wilcox Ln
Old Marlborough Tpke
Goodrich Ln
Cornwall St
South Rd
Coxs Rd
Cox Rd
Woodchoppers Rd
Fox Run Rd
Gospel Ln
Rose Hill Rd
Indian Hill Ave
Taylor Dr
Ann St
Summer St
Bell Ct
Victoria Rd
Bartlett St
Michael Dr
Fairway Dr
Gildersleeve Rd
Collins Hill Rd
Great Hill Rd
Stewart Hill Rd
Culver Ln
Wildwood Rd
Jobs Pond Rd
Pepperidge Rd
Penfield Hill Rd
Maple Rd
Lisa Ct
Lake Rd
Depot Hill Rd
Breezy Corner Rd
Wellyn Dr
Jobs Gate 1
Jobs Gate 3
Portland Cobalt Rd
Sand Hill Rd
Grandview Ter
Ames Hollow Rd
Williams St
State Hwy 17 Alt
Carlson Dr
William St
Scenic Dr
High St
Coe Ave
Prout St
Hilltop Dr
Spring St
Main St
Fairview St
Myrtle Rd
Burr St
Freestone Ave
Brownstone Ave
Airline Ave
Riverside St
Riverview St
Grove St
0
0.5
1
2
Miles
Legend (2015-2019)
Schools
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury

Field Site Inventory

CT-17A (Main Street) North of Coe Avenue – Gildersleeve Area

CT-17A (Main Street) north of Coe Avenue is a two-lane roadway, with one travel lane in each direction and shoulders varying from two to four feet wide. There is a painted double yellow centerline and shoulder lines, with a midblock pedestrian crossing on CT-17A (Main Street) at Summer Street. This pedestrian crossing has MUTCD-compliant crosswalk signage, though both directions of CT-17A (Main Street) do not have sidewalks at this location. Sidewalks are present along the west side of CT-17A (Main Street) from the south until Summer Street, though there are no sidewalks on either side north of this intersection. The only other crosswalk within this corridor is at the signalized intersection of CT-17A (Main Street) at Gildersleeve School. CT-17A (Main Street), with the exception of the intersection at Gildersleeve School, operates under free flow conditions, while the side streets are stop-controlled. The posted speed limit along CT-17A (Main Street) north of Coe Avenue is 35 mph.

Recommendations:

- Consider narrowing travel lanes along CT-17A (Main Street) north of Coe Avenue to 11 feet to discourage speeding.
- Consider installing traffic calming measures, such as gateway treatments, to more clearly designate and highlight this area.
- Consider the implementation of high visibility enforcement along the corridor.
- Consider extending sidewalks north of Summer Street, including at the designated midblock crosswalk at Summer Street. In addition, consider providing ADA-compliant pedestrian ramps at the Summer Street midblock crossing.
- Consider the installation of sidewalks along the east side of CT-17A (Main Street), in the vicinity of Gildersleeve School.

CT-17A (Main Street) at Gildersleeve School looking north. Source: VN Engineers


Pedestrian Crossing at CT-17A (Main Street) and Summer Street looking south. Source: VN Engineers

Field Site Inventory

CT-66 (Portland-Cobalt Road) at The Ledges near Saint Clements Castle

CT-66 (Portland-Cobalt Road) at "the ledges" near Saint Clements Castle is a two-lane road, with one travel lane in each direction and shoulders varying from one to three feet wide. There is a painted double yellow centerline and shoulder lines, with rock outcroppings along the shoulders in both directions of travel. Both approaches have limited sight distance as a result of horizontal and vertical curvature throughout the corridor. There are advance curve warning and chevron signs along both directions of CT-66 (Portland-Cobalt Road) at "the ledges", as well as centerline rumble strips. The addition of chevron signs and centerline rumble strips, as well as LED streetlights, were recent improvements made by CTDOT. The posted speed limit along this corridor is 45 mph.

Recommendations:

- Consider the installation of shoulder rumble strips on CT-66 (Portland-Cobalt Road), in the vicinity of "the ledges" near Saint Clements Castle.
- Consider the installation of dynamic speed feedback signs along this segment.
- Consider the implementation of high visibility enforcement along this segment.
- Consider trimming excess vegetation on this segment of CT-66 (Portland-Cobalt Road) to improve visibility.

CT-66 (Portland-Cobalt Road) at "the ledges" looking east. Source: VN Engineers

CT-66 (Portland-Cobalt Road) at "the ledges" looking east. Source: VN Engineers

Portland Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-17A (Main St) North of Coe Ave – Gildersleeve Area	Speeding	Consider narrowing travel lanes along CT-17A (Main St) north of Coe Avenue to 11 feet to discourage speeding	Low
		Consider installing traffic calming measures, such as gateway treatments, to more clearly designate and highlight this area	Low
		Consider the implementation of high visibility speed enforcement	Low-Medium
	Pedestrian mobility and safety	Consider extending sidewalks north of Summer St, including the designated midblock crosswalk at Summer St. In addition, consider providing ADA-compliant pedestrian ramps at the Summer St midblock crossing	Medium-High
		Consider the installation of sidewalks along the east side of CT-17A (Main St), in the vicinity of Gildersleeve School	Medium-High
CT-66 (Portland-Cobalt Rd) at "the ledges" near Saint Clements Castle	Roadway curvature and lane departure	Consider the installation of shoulder rumble strips on CT-66 (Portland-Cobalt Rd), in the vicinity of "the ledges" near Saint Clements Castle	Low
	Speeding	Consider the installation of dynamic speed feedback signs along this segment	Low
		Consider the implementation of high visibility enforcement along this segment	Low-Medium
	Limited sight distance	Consider trimming excess vegetation on this segment of CT-66 (Portland-Cobalt Rd) to improve visibility	Low
CT-17A (Main St) South of Coe Ave	High volume of left turns and traffic conflict	Consider the installation of two-way center left-turn lanes along CT-17A (Main St) south of Coe Ave	Low-Medium

TOWN OF WESTBROOK

2020 Population Estimate: 7,079

Area: 15.7 square miles

Population Density: 451 persons per square mile

Latest (2016) Vehicle Miles Traveled (VMT): 126,110,686

Latest (2016) VMT per Capita: 17,815

Setting: Rural/Suburban

Town and Regional Representatives: Noel Bishop (First Selectman), April Moran (Resident State Trooper), Susan Helchowski (Town of Westbrook), Robert Haramut (RiverCOG)

Data Identified High Crash Corridors: US-1 (Boston Post Road) from Post Avenue to Fawn Hill Drive

Data Identified High Crash Intersections: N/A

Bike and Ped Injury and Fatal Crash Injuries, 2015-2019: 10

Total Number of Crashes Involving Injuries or Fatalities, 2015-2019: 143

CT-145 (Horse Hill Road). Source: VN Engineers

Overview

Westbrook is a town in Middlesex County bordered by Deep River and Essex to the north, Old Saybrook to the east, Clinton and Killingworth to the west, and the Long Island Sound to the south. The Town's main thoroughfares are I-95, US-1, CT-145, CT-153, CT-166, and CT-625.

Westbrook Total Crashes by Severity

Crash Severity	2015	2016	2017	2018	2019
Fatal Injury (K)	2	0	0	0	1
Suspected Serious Injury (A)	1	1	0	0	1
Suspected Minor Injury (B)	14	20	16	13	5
Possible Injury (C)	12	15	15	6	21
Total Injury Crashes	29	36	31	19	28

Town's Input

Fatal Crashes from 2015-2019

- **US-1 (Boston Post Road)** - Motorcycle fatal crash.
- **CT-166 (Spencer Plains Road)** - Substance-impaired driver involved in bicyclist fatal crash.
- **Dennison Road and West Pond Meadow Road** - Roadway departure fatal crash.

CT-145 (Old Clinton Road/Horse Hill Road/Stevenstown Road)
Speeding is an issue along this corridor, particularly between Interstate 95 and the intersection with Cross Road and Old Horse Hill Road. The Town noted that speeding has been attributed with many of the crashes along this corridor and is a priority of the resident state trooper. In addition to the crash data from 2015 to 2019, the Town noted that in 2020 there was a fatal sideswipe crash on CT-145 (Horse Hill Road) at Ortner Drive. CT-145 (Old Clinton Road/Horse Hill Road/Stevenstown Road) has heavy volumes because of the direct north-south connection between Interstate 95 and residential communities to the north.

US-1 (Boston Post Road)
The US-1 (Boston Post Road) corridor has a high frequency of curb cuts and pedestrian traffic associated with commercial uses. This corridor also has a high cluster of front-to-rear crashes and high volumes of traffic, which increase in the summer due to the seasonal attraction of the shoreline. As a result, there is an increase in patrolling during the summer.

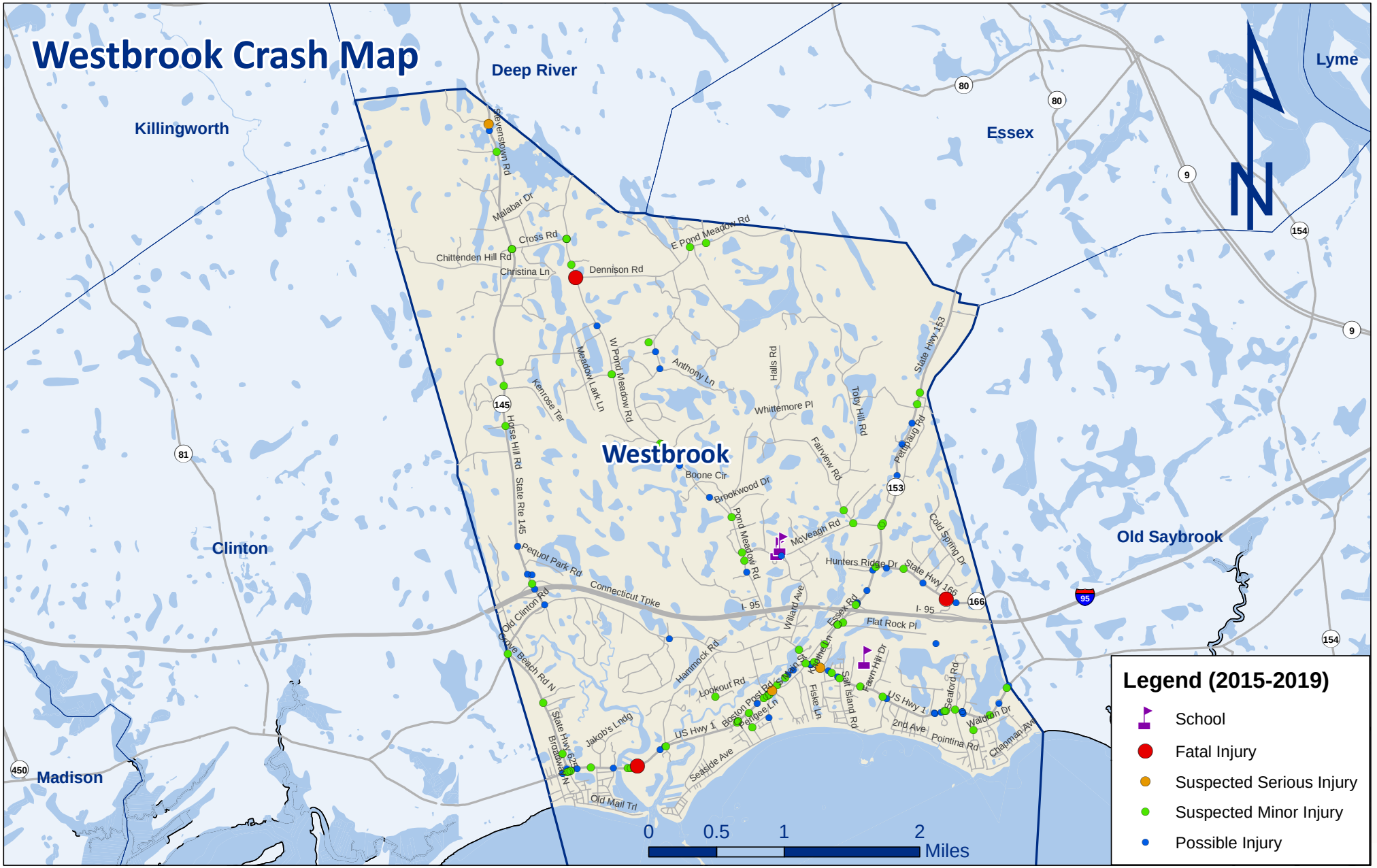
Seaside Avenue
Seaside Avenue is a local road that runs along the shoreline to Westbrook Town Beach, with intermittent crosswalks for pedestrian beach access. The Town noted that residents are concerned with speeding, but do not want speed tables. As a result, there is an additional police presence to minimize speeding.

CT-153 (Essex Road)
The Town noted that speeding is common along CT-153 (Essex Road). This corridor also has a high volume of crashes throughout the corridor.

Community Connectivity Grant Program (CCGP)
The Town submitted a grant application to install sidewalks to connect the Westbrook Train Station with the Valley Shore YMCA, but they did not receive the requested funding. Sidewalks have already been installed using CCGP funding along portions of CT-153 (Essex Road) and CT-166 (Spencer Plains Road). In 2020, the Town used STEAP Grant funding to design sidewalks along US-1 between Bellstone Avenue and Osprey Circle.

Pond Meadow Road
Pond Meadow Road is a local roadway with a narrow cross section and despite this, bicyclists use this route, which has no shoulders or edge lines. This street has horizontal curvature and a high prevalence of roadway departure crashes.


CT-145 (Horse Hill Road). Source: VN Engineers


Westbrook Crash Map
Deep River
Killingworth
Essex
Lyme
Clinton
Old Saybrook
Madison
Westbrook
Stevenstown Rd
Malabar Dr
Cross Rd
Chittenden Hill Rd
Christina Ln
Dennison Rd
E Pond Meadow Rd
W Pond Meadow Rd
Meadow Lark Ln
Kenrose Ter
Anthony Ln
Halls Rd
Whittemore Pl
Toby Hill Rd
State Hwy 153
Perthaug Rd
Fairview Rd
Boone Cir
Brookwood Dr
Pond Meadow Rd
McVeagh Rd
Hunters Ridge Dr
State Hwy 166
Cold Spring Dr
Horse Hill Rd
State Rte 145
Pequot Park Rd
Connecticut Tpke
I- 95
Old Clinton Rd
Cove Beach Rd N
Willard Ave
Essex Rd
Flat Rock Pl
Hammock Rd
Lookout Rd
Boston Post Rd
Pledge Ln
Fiske Ln
Salt Island Rd
Pawn Hill Dr
US Hwy 1
Seaford Rd
Waldron Dr
2nd Ave
Pointina Rd
Chapman Ave
Seaside Ave
Jakob's Lndg
State Hwy 625
Broadway N
Old Mail Trl
0 0.5 1 2 Miles
Legend (2015-2019)
School
Fatal Injury
Suspected Serious Injury
Suspected Minor Injury
Possible Injury

Field Site Inventory

CT-145 (Horse Hill Road) between Interstate 95 and Cross Road

CT-145 (Horse Hill Road) is a two-lane collector that links Interstate 95 with CT-80 (Winthrop Road) in Deep River. This corridor is a core route for traffic traveling to and from Interstate 95 to the Killingworth and Deep River areas. The speed limit varies between 35 mph and 45 mph along the corridor. Shoulders also vary between one and two feet on each side. Passing is allowed on the southern portion of CT-145 (Horse Hill Road), south of Break Neck Hill Road.

The corridor has several horizontal curves and one ascending grade approaching the Interstate 95 interchange. Guide rail is intermittent throughout the area and there are several side roads present along this corridor, with most of them being dead ends. All local roads are under stop control, while CT-145 (Horse Hill Road) operates under free flow conditions. Additionally, the area is mostly residential, with the afore-mentioned side roads being fully residential or agricultural. Several driveways on the west side of CT-145 (Horse Hill Road) have steep grades descending away from corridor. Vehicles attempting to turn onto CT-145 (Horse Hill Road) from these driveways may have poor line of sight. A CTDOT Maintenance Crew from District 4 was present on CT-145 (Horse Hill Road) Southbound, with a flagging pattern during this field visit. Break Neck Road was closed to through traffic during this field visit, with a detour in place.

Recommendations:

- Consider the installation of centerline rumble strips along CT-145 (Horse Hill Road). Centerline rumble strips are to be installed in 2021 or 2022 on Route 145 (Horse Hill Road) from Old Clinton Road in Westbrook to Route 80 (Winthrop Rd) in Deep River.
- Consider the implementation of high visibility enforcement, in coordination with the Westbrook Resident State Trooper.
- Consider the installation of dynamic speed feedback signs.
- Consider investigating the horizontal curvature along this corridor to determine if advance warning signage is needed.

CT-145 (Horse Hill Road) and Interstate 95 looking north. Source: VN Engineers


CT-145 (Horse Hill Road) and Break Neck Road looking south. Source: VN Engineers

Field Site Inventory

CT-153 (Essex Road) between Interstate 95 and the Westbrook/ Essex Town Line

CT-153 (Essex Road) is a two-lane collector that links Interstate 95 to Essex. The speed limit varies between 35 mph and 40 mph along the corridor. Shoulders also vary between one and two feet on each side, with this corridor having a narrow cross section. The corridor has several horizontal curves and an ascending grade approaching the Interstate 95 interchange, though there is a general lack of signage at the horizontal and vertical curvature. In general, local roads are under stop control, while CT-153 (Essex Road) operates under free flow conditions. Within this corridor, CT-153 (Essex Road) intersects CT-166 (Spencer Plains Road)/Hunters Ridge Drive at an offset, signalized intersection. Additionally, the area is mostly residential, with the aforementioned side roads generally being residential.

Recommendations:

- Consider the installation of centerline rumble strips along CT-153 (Essex Road). Centerline rumble strips are proposed to be installed in 2021 or 2022 on Route 153 (Essex Road) from Monahan Road to Timberlane Drive.
- Consider the implementation of high visibility enforcement, in coordination with the Westbrook Resident State Trooper.
- Consider the installation of dynamic speed feedback signs.
- Consider investigating the horizontal curvature along this corridor to determine if advance warning signage is needed.

CT-153 (Essex Road) and CT-166 (Spencer Plains Road)/Hunters Ridge Drive looking south. Source: VN Engineers

CT-153 (Essex Road) and Pettipaug Road looking north. Source: VN Engineers

Westbrook Countermeasure Considerations

Locations	Issues	Countermeasures	Estimated Cost
CT-145 (Horse Hill Rd) between Interstate 95 and Cross Rd	Roadway curvature	Consider the installation of centerline rumble strips along CT-145 (Horse Hill Rd)	Low
		Consider investigating the horizontal curvature along this corridor to determine if advance warning signage is needed	Low
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
CT-153 (Essex Rd) between Interstate 95 and the Westbrook/Essex Town Line	Roadway curvature	Consider the installation of centerline rumble strips along CT-153 (Essex Rd)	Low
		Consider investigating the horizontal curvature along this corridor to determine if advance warning signage is needed	Low
	Speeding	Consider the installation of dynamic speed feedback signs	Low
		Consider the implementation of high visibility enforcement	Low-Medium
Seaside Ave	Speeding	Consider the installation of dynamic speed feedback signs	Low
Pond Meadow Rd	Narrow cross section and high bicyclist usage	Consider widening Pond Meadow Rd to allow for a shoulder for bicyclists or consider adding painted edge lines	Medium

Appendix B: Emphasis Areas

INTERSECTION FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	3	3	2	3	5
Clinton	12	6	3	8	14
Cromwell	38	33	48	35	31
Deep River	1	2	3	5	0
Durham	7	9	15	9	10
East Haddam	9	9	3	12	3
East Hampton	18	17	15	17	16
Essex	6	5	5	4	4
Haddam	13	6	7	9	5
Killingworth	6	5	9	4	7
Lyme	0	0	0	1	1
Middlefield	11	8	8	11	10
Middletown	109	127	113	125	122
Old Lyme	6	7	6	8	6
Old Saybrook	15	22	25	12	14
Portland	11	11	12	14	18
Westbrook	14	9	14	5	9
Region Totals	**279**	**279**	**288**	**282**	**275**

ROADWAY DEPARTURE FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	4	4	5	5	6
Clinton	12	7	1	5	16
Cromwell	12	11	8	13	10
Deep River	6	4	6	6	4
Durham	9	10	15	5	8
East Haddam	16	26	22	15	15
East Hampton	12	10	11	16	10
Essex	4	9	4	7	5
Haddam	19	16	15	20	24
Killingworth	7	9	8	10	11
Lyme	5	6	3	5	4
Middlefield	6	6	4	4	4
Middletown	30	29	33	33	23
Old Lyme	11	2	9	7	10
Old Saybrook	6	9	7	6	1
Portland	8	12	23	13	7
Westbrook	11	8	15	7	7
Region Totals	**178**	**178**	**189**	**177**	**165**

AGGRESSIVE DRIVING (SPEEDING) FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	1	0	2	4	2
Clinton	9	3	0	4	7
Cromwell	5	6	5	6	3
Deep River	4	2	4	4	0
Durham	2	3	6	3	6
East Haddam	6	18	10	6	6
East Hampton	6	2	7	9	4
Essex	2	3	3	4	3
Haddam	8	9	8	10	7
Killingworth	2	0	5	5	6
Lyme	0	2	1	4	0
Middlefield	7	6	4	6	3
Middletown	45	63	51	52	39
Old Lyme	4	5	4	4	6
Old Saybrook	0	2	3	2	2
Portland	6	6	9	10	7
Westbrook	3	4	7	4	1
Region Totals	**110**	**134**	**129**	**137**	**102**

UNRESTRAINED OCCUPANT FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	0	0	0	0	1
Clinton	0	0	0	1	2
Cromwell	1	3	1	3	4
Deep River	0	0	0	0	0
Durham	2	1	1	1	3
East Haddam	0	3	4	6	4
East Hampton	6	4	2	3	1
Essex	1	0	0	1	0
Haddam	1	3	2	1	1
Killingworth	2	2	0	0	0
Lyme	0	1	1	0	0
Middlefield	3	1	1	3	0
Middletown	11	18	7	12	10
Old Lyme	1	0	0	0	1
Old Saybrook	0	3	4	1	1
Portland	2	4	2	4	2
Westbrook	1	5	2	0	1
Region Totals	**31**	**48**	**27**	**36**	**31**

SUBSTANCE-IMPAIRED FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	1	1	2	0	0
Clinton	5	2	0	1	8
Cromwell	6	3	6	4	6
Deep River	0	2	1	0	0
Durham	0	3	2	1	0
East Haddam	3	2	2	2	4
East Hampton	1	5	5	5	4
Essex	2	0	0	0	2
Haddam	3	0	0	3	2
Killingworth	1	1	0	0	0
Lyme	0	1	0	0	0
Middlefield	1	2	1	0	1
Middletown	6	9	14	13	8
Old Lyme	1	0	2	1	1
Old Saybrook	3	4	2	4	1
Portland	0	1	3	1	5
Westbrook	0	3	3	2	1
Region Totals	**33**	**39**	**43**	**37**	**43**

DISTRACTED DRIVING FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	0	1	0	2	1
Clinton	1	0	1	0	0
Cromwell	1	3	3	2	3
Deep River	3	0	0	0	1
Durham	4	1	3	1	2
East Haddam	3	6	5	1	2
East Hampton	3	2	2	1	2
Essex	0	1	1	1	1
Haddam	2	4	4	3	6
Killingworth	3	0	1	1	2
Lyme	1	0	0	0	0
Middlefield	2	1	0	1	0
Middletown	5	11	9	10	8
Old Lyme	2	0	1	0	0
Old Saybrook	3	1	2	3	1
Portland	2	5	3	4	2
Westbrook	1	2	2	1	1
Region Totals	**36**	**38**	**37**	**31**	**32**

OLDER DRIVER FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	1	0	3	2	5
Clinton	6	2	1	5	9
Cromwell	14	10	12	10	10
Deep River	2	3	2	2	2
Durham	2	1	1	5	3
East Haddam	1	4	2	4	2
East Hampton	9	8	6	5	5
Essex	5	3	4	4	4
Haddam	5	1	2	3	6
Killingworth	2	6	4	6	4
Lyme	1	3	1	0	0
Middlefield	4	2	4	0	3
Middletown	15	24	26	23	25
Old Lyme	6	4	0	3	8
Old Saybrook	8	8	13	10	6
Portland	9	10	10	7	8
Westbrook	3	3	0	1	6
Region Totals	**93**	**92**	**91**	**90**	**106**

YOUNG DRIVER FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	3	3	2	0	1
Clinton	8	7	1	4	7
Cromwell	22	10	20	10	10
Deep River	3	4	6	2	2
Durham	4	5	5	6	11
East Haddam	11	19	9	7	4
East Hampton	9	12	8	8	8
Essex	2	6	2	6	1
Haddam	14	9	5	11	12
Killingworth	6	5	3	3	7
Lyme	2	1	1	3	3
Middlefield	5	9	5	6	3
Middletown	45	58	43	49	41
Old Lyme	7	2	8	5	5
Old Saybrook	5	9	10	5	7
Portland	11	8	9	11	11
Westbrook	9	6	8	4	3
Region Totals	**166**	**173**	**145**	**140**	**136**

PEDESTRIAN FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	1	0	0	1	0
Clinton	0	0	1	4	2
Cromwell	7	4	10	4	1
Deep River	0	1	0	0	0
Durham	0	1	1	0	0
East Haddam	0	0	0	0	0
East Hampton	0	1	1	3	1
Essex	1	1	0	0	0
Haddam	0	0	1	1	0
Killingworth	0	0	0	0	1
Lyme	0	0	0	0	0
Middlefield	0	1	0	0	2
Middletown	16	10	16	13	22
Old Lyme	2	2	1	1	0
Old Saybrook	2	4	2	1	2
Portland	1	1	1	1	1
Westbrook	3	2	1	2	0
Region Totals	**33**	**28**	**35**	**31**	**32**

BICYCLE FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	1	0	0	0	0
Clinton	1	0	0	0	0
Cromwell	1	0	4	2	1
Deep River	0	1	1	0	1
Durham	0	1	2	0	0
East Haddam	1	1	0	0	0
East Hampton	1	2	0	0	0
Essex	0	0	1	0	0
Haddam	0	1	0	0	0
Killingworth	0	0	0	0	0
Lyme	0	0	0	0	0
Middlefield	0	1	0	0	1
Middletown	5	4	0	4	7
Old Lyme	0	0	0	0	1
Old Saybrook	1	5	2	5	2
Portland	0	0	0	0	0
Westbrook	0	0	1	0	1
Region Totals	**11**	**16**	**11**	**11**	**14**

MOTORCYCLE FATAL AND INJURY CRASHES

Municipality	2015	2016	2017	2018	2019
Chester	2	1	2	1	2
Clinton	1	2	0	1	3
Cromwell	3	6	3	4	2
Deep River	0	0	1	1	1
Durham	2	3	0	1	3
East Haddam	3	12	11	5	1
East Hampton	5	0	1	5	2
Essex	1	2	1	2	1
Haddam	2	0	2	0	3
Killingworth	5	3	0	2	5
Lyme	0	2	0	4	1
Middlefield	2	0	0	2	1
Middletown	12	10	12	14	13
Old Lyme	7	1	0	3	2
Old Saybrook	2	7	1	4	0
Portland	4	7	6	4	6
Westbrook	4	4	3	3	3
Region Totals	**55**	**60**	**43**	**56**	**49**

Appendix C: Infrastructure Countermeasure Table

The countermeasures included in this report were determined based on an analysis of historical data for crashes involving injuries or fatalities, discussions with Region and town officials, the Connecticut Strategic Highway Safety Plan, FHWA's List of Proven Countermeasures and NHTSA's Countermeasures that Work, 8th edition.

	Measure	Description	Application
Signage	**Speed Feedback Signs**[1,2] Cost: Low	A changeable message sign that displays the speed of approaching vehicles.	To be used where motorized vehicle speed is a concern.
Signage	**Retroreflective Signal Backplates** Cost: Low-Medium	Improved visibility of a signal head with a backplate is made even more conspicuous by framing it with a retroreflective border.	Signal heads that have backplates equipped with retroreflective borders are more visible and conspicuous in both daytime and nighttime conditions. Cost may depend on the need to replace span wire with mast arms.
Signal	**Change Left-Turn Phase to Protected Phasing** Cost: Low	Modify existing phasing to a protected phase.	"Protected-only" phasing consists of providing a separate phase for left-turning traffic and allowing left turns to be made only on a green left arrow signal indication, with no pedestrian movement or vehicular traffic conflicting with the left turn. As a result, left-turn movements with "protected-only" phasing have a higher capacity than those with "permissive-only" phasing due to fewer conflicts.[3]
Signage	**Flashing Advance Warning Beacons** Cost: Low to Medium	A beacon that provides a warning to motorists about an intersection ahead.	To be used in advance of an intersection.
Signage	**No Right Turn on Red** Cost: Low	A sign that prohibits right turns during the red phase due to exclusive pedestrian phases, high traffic or pedestrian volumes, or inadequate visibility.	Together with a leading pedestrian interval, the restriction can benefit pedestrians with minimal impact on traffic. Part-time prohibitions during the busiest times of the day may be adequate to address the problem.
Signage	**Additional Horizontal Curve Warning and Chevron Signs** Cost: Low	Additional signs help to increase the noticeability of signage in situations where standard signage is insufficient.	While agencies apply signing devices uniformly, adding additional signs may be necessary depending on an assessment of speed, unexpected geometric features, traffic volume, and crash data.

1 Federal Highway Administration. (2009). Engineering Countermeasures for Reducing Speeds: A Desktop Reference of Potential Effectiveness. Washington, D.C.: Federal Highway Administration.
2 Overuse of signs and pavement markings may reduce their effectiveness. These devices should be used in locations where the needs are greatest.
3 Federal Highway Administration. (2004). Signalized Intersections: Informational Guide. https://www.fhwa.dot.gov/publications/research/safety/04091/04.cfm

	Measure	Description	Application
Pavement Markings	**Regulatory Pavement Markings**[1] Cost: Low	Pavement markings, such as "25 mph", that emphasize regulatory signage (MUTCD Section 3B.20).	To be used as a supplement to regulatory signs.
Pavement Markings	**Crosswalks** Cost: Varies Low -markings only Medium -markings and simple ADA landings; High-significant pedestrian safety features required	Pavement markings delineating a portion of the roadway that is designated for pedestrian or bicycle crossing. There are several types including: continental, zebra, and standard (MUTCD Section 3B.18).	To be used at intersections or midblock crossings. Crosswalks may be used in areas with lower traffic volumes, lower speeds, and a limited number of travel lanes. See Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations for additional guidance regarding when to install a marked crosswalk.
Pavement Markings	**Road Reconfigurations** Cost: Low to High	Roadway retrofit techniques designed to produce a wide variety of benefits including reduced traffic speeds, reduced crashes, improved access management, improved accessibility for pedestrians or bicyclists, improved parking utilization, as well as improved economic vitality for businesses along those streets. Can include a variety of measures such as road diets and lane narrowing to include bike lanes.	For use in areas where speed and pedestrian and bicycle accessibility are a concern.
Physical Environment	**Buffered Shoulders** Cost: Low for restriping existing paved shoulder, high for constructing new paved shoulder	A paved shoulder that is separated by a pavement marking to create a buffer from the vehicle travel lanes. The buffer space may be marked with diagonal pavement markings and ranges from 1 to 4 feet wide.	To be used in areas where pedestrian, bicycle, and/or horse-drawn vehicle volumes and motor vehicle volumes and speeds combine to create the need for separated and buffered space along the roadway.
Physical Environment	**Bike Lanes**[2] Cost: Varies	A lane in the roadway designated for bicycle use with striping, signing, and pavement markings (MUTCD Chapter 9B and 9C).	To be used in areas with high volumes and speeds of motor vehicles and bicycles (RV).
Physical Environment	**Roadway Surface Improvements** Cost: Varies greatly based on conditions present	Roadway surface improvements include maintenance and paving activities to provide a smooth and slip-resistant traveling surface for pedestrians and cyclists.	Facilities used by pedestrians and cyclists should be smoother than those deemed acceptable for motorized traffic to maintain stability. Therefore, it is important that debris be cleared from facilities used by pedestrians and cyclists. If rumble strips are present, sufficient gaps should be provided for cyclists to move from the shoulder to the travel lane. Additionally, there should be sufficient width for cyclists to ride between the edge of the rumble strip and the edge of the shoulder.

1 Federal Highway Administration. (2009). Manual on Uniform Traffic Control Devices. Washington, D.C.: Federal Highway Administration.
2 American Association of State Highway Safety Officials. (1999). Guide for the Development of Bicycle Facilities. Washington, D.C.: American Association of State Highway Safety Officials.

	Measure	Description	Application
Physical Environment	**Median Crossing Islands** Cost: Medium	A raised island in the center of the roadway with a refuge area that is accessible for pedestrians of all abilities. Can also provide a refuge area for cyclists, especially at locations where a shared use path crosses a roadway. The island allows pedestrians and cyclists to cross one direction of traffic at a time.	To be used when pedestrians and cyclists have to cross high-volume, multilane roadways (MUTCD Chapter 3I), (RV).
Physical Environment	**Rectangular Rapid Flash LED Beacons**[1] Cost: Medium	A beacon that provides a warning to motorists about the presence of a crosswalk. Beacon is yellow, rectangular, and has a rapid "wig-wag" flash like police lights. Beacon should operate only when a pedestrian is present; utilize either push button or passive detection.	For use at midblock crossings and intersections that do not warrant a signal.
Physical Environment	**Roadway Illumination**[2] Cost: Medium	Lighting directed to illuminate the roadway.	To be used on sections of roadway with high volumes of nighttime non-motorized activity.
Physical Environment	**Road Diets** Cost: Low to Medium	A redistribution of space in the roadway leading to a reduction in the number of travel lanes for motor vehicles on a roadway. The road diet is one of FHWA's Proven Safety Countermeasures and may provide space for bike lanes, sidewalk, or medians, and can help to reduce motor vehicle speed.	For use in areas with pedestrian crossings, multiple lanes of traffic, and high vehicle speeds.
Physical Environment	**Gateways** Cost: Low to High	Visual or physical markers to serve as an indicator to motorists that they are entering an urbanized area and to slow down.	For use at the entrance of a residential or commercial area.
Physical Environment	**Shared Use Paths** Cost: Medium to High	A facility separated from motorized vehicular traffic by a landscaped space or barrier. Shared use paths may be used by cyclists, pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Such facilities are often referred to as "trails."	To be used in areas with a high volume of pedestrians and bicyclists and high motor vehicle speeds or volumes.

1 Federal Highway Administration. (2008). Guidance Memorandum on Consideration and Implementation of Proven Safety Countermeasures. Retrieved August 29, 2011 from Federal Highway Administration: http://safety.fhwa.dot.gov/policy/memo071008.
2 Hall, J. W., Brogan, J. D., & Kondreddi, M. (2004). Pedestrian Safety on Rural Highways. FHWA-SA-04-008. Washington, D.C.: Federal Highway Administration.

	Measure	Description	Application
Signage	**Pedestrian Hybrid Beacons** Cost: High	The pedestrian hybrid beacons (PHB) are traffic control devices designed to help pedestrians safely cross busy or higher-speed roadways at midblock crossings and uncontrolled intersections.	The PHB is an intermediate option between a flashing beacon and a full pedestrian signal because it assigns right of way and provides positive stop control. It also allows motorists to proceed once the pedestrian has cleared their side of the travel lane, reducing vehicle delay.
Pavement Markings	**Roadway (or Transverse) Rumble Strips** Cost: Low	Raised bars or grooves placed across the travel lane that can be either black or white.	To be used to alert drivers of the need to reduce speed in locations where other measures cannot be applied or have been tested and have not succeeded in addressing speeding issues. Bicyclist (and motorcyclist) concerns should be addressed by a break in the strips and installing a warning sign reading "Rumble strips ahead" May have limited use because of citizens concerns over noise from vehicles driving over.
Pavement Markings	**Shoulder Rumble Strips** Cost: Low	Raised bars or grooves placed at the edge of the travel lane.	Longitudinal rumble strips are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicles have left the travel lane. They can be installed on the shoulder, edge line of the travel lane, or at or near center line of an undivided roadway
Pavement Markings	**Centerline Rumble Strips** Cost: Low	Raised bars or grooves placed at or near the centerline travel lane.	Longitudinal rumble strips are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicles have left the travel lane. They can be installed on the shoulder, edge line of the travel lane, or at or near center line of an undivided roadway.
Pavement Markings	**Lane Narrowing** Cost: Low to High	The narrowing of travel lanes—either visually (by using pavement markings) or physically narrowing (with measures such as curb extensions). One example of visually narrowing lanes is a painted island that is an island defined by pavement markings and created with the function of reducing lane widths for traffic calming purposes.[1]	For use in areas with wide travel lanes and where speed is a concern (MUTCD Chapter 3I).

1 Federal Highway Administration. (2009). Manual on Uniform Traffic Control Devices. Washington, D.C.: Federal Highway Administration

Appendix D: Vision Zero Council

The Zero Vision Council of Connecticut was established in 2021 by the Connecticut General Assembly as part of Public Act 21-28. It is an interagency work group tasked with developing statewide policy to eliminate transportation-related fatalities and severe injuries involving pedestrians, bicyclists, transit users, motorists, and passengers.

MISSION STATEMENT

The Vision Zero Council (VZC) believes even one life lost in a traffic crash is unacceptable, traffic deaths are preventable, and commits to using all available tools to eliminate conditions
and behaviors that lead to serious injuries and deaths. The goal of the VZC is to bring together stakeholders to introduce policies, establish partnerships, and leverage available technologies to prevent death and serious injuries. Working together, we will eliminate traffic deaths and life-altering injuries.

The VZC will build new and strengthen existing partnerships between state agencies and safety advocates who are committed to eliminating traffic crashes that cause death and serious injuries. Through policies that make roadways safer and through inclusive community engagement VZC will achieve the goal of zero deaths from traffic fatalities.

VZC members include the commissioners (or their designees) of the Departments of Transportation, Public Health, Emergency Services and Public Protection, Motor Vehicles, Education, Aging and Disability Services, and Deputy State's Attorney.

STATE-WIDE POLICY AND INTERAGENCY APPROACH

This policy is developed in accordance with Section 2(e) of Connecticut Public Act 21-28, AN ACT CONCERNING PEDESTRIAN SAFETY, THE VISION ZERO COUNCIL, SPEED LIMITS IN MUNICIPALITIES, FINES AND CHARGES FOR CERTAIN VIOLATIONS AND THE GREENWAYS COMMEMORATIVE ACCOUNT, of the Connecticut General Statutes (CGS 13b-23b). It is the policy of the Vision Zero Council to develop an interagency approach to eliminate all transportation-related fatalities and severe injuries to pedestrians, bicyclists, transit users, motorists and passengers. The council shall consider ways to improve safety across all modes of transportation by using data, building new partnerships, implementing safe planning and community-based solutions to achieve the goal of zero transportation-related fatalities. The following policy will be adopted by all agencies who sit on the council.

Public, High-Level, and Ongoing Commitment

High-level leadership and sustained political commitment are essential to Vision Zero success. Participating agency commissioners or their designees and other key elected officials must set the tone and direction for Vision Zero and back up their words of commitment with action, reflected in data- driven and equitable spending decisions, effective policies, and evidence-based practices that prioritize safety (even when this means a shift from the status quo). Following from this, the leaders of the public health, police, and transportation agencies should be closely involved with the day-to-day work of Vision Zero and ensure consistent interagency coordination.

Authentic Engagement

Meaningful and accessible community engagement toward Vision Zero strategy and implementation is employed, with a focus on equityns

•Engage the community in meaningful, culturally relevant ways and support involvement by influential community leaders
•Prioritize support of communities most impacted by traffic crashes and most traditionally underserved by safety efforts and equitable infrastructure planning decisions

Strategic Planning
A Vision Zero Action Plan is developed, approved, and used to guide work. The Plan includes explicit Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) goals, and it identifies responsible stakeholders

•The Action Plan and corresponding strategies are built on the Safe Systems approach by designing and maintaining a transportation system where human error does not result in loss of life or severe injury or disability
•Leadership across these agencies consistently prioritizes safety via a collaborative working group and other resource-sharing efforts

Equity-Focused Analysis and Programs

•Commitment is made to an equitable approach and outcomes, including prioritizing engagement and investments in traditionally under-served communities and continuing to practice equitable traffic enforcement.
•Any enforcement efforts within Vision Zero will be focused on traffic violations that pose a danger on our roadways as identified by quality data analysis to prevent any disproportionate enforcement levels by race, ethnicity, disability, and socioeconomic status.

Procedures:

Political Commitment
The commissioners of the state agencies that make up the Vision Zero Council commit to shared goals and objectives toward a Vision Zero goal to achieve zero traffic fatalities, serious injuries, and disability among all road users (including people walking, biking, using transit, and driving) within a set timeframe. This should include passage of a local policy laying out goals, timeline, stakeholders, and a commitment to community engagement, transparency, and equitable outcomes. Leadership across these agencies consistently engages in prioritizing safety via a collaborative working group and other resource sharing efforts.

Equity
Vision Zero Council members, and stakeholders commit to an equitable approach to Vision Zero by establishing inclusive and representative processes and equitable outcomes by ensuring measurable benchmarks to provide safe transportation options for all road users.

Development of an Action Plan
A Vision Zero Action Plan (or Strategy) will be created following the acceptance of the Vision Zero Interagency Policy. The Action Plan is implemented with clear strategies, “owners” of each strategy, interim targets, timelines, and performance measures.

Cooperation and Collaboration
A commitment is made to encourage meaningful cooperation and collaboration among relevant governmental agencies and community stakeholders to establish a framework for multiple stakeholders to set shared goals and focus on coordination and accountability.

Safe Systems Approach Vision Zero Council members commit to and prioritize a safe systems-based approach to Vision Zero — focusing on the built environment, systems, and policies that influence behavior — as well as adopting messaging that emphasizes that these traffic losses, injuries, and disabilities are preventable.

Data Driven Analysis
Vision Zero Council members commit to gather, analyze, utilize, and share reliable data to understand traffic safety issues and prioritize resources based on evidence of the greatest needs and impact.

Transparency
The Vision Zero Council's processes are transparent. Safety stakeholders and the larger safety community work together to provide regular updates on the progress of the Action Plan and performance measures and submit a yearly report.

RiverCOG supports the efforts of the VZC to develop an interagency approach to eliminate transportation-related fatalities and severe injuries to pedestrians, bicyclists, transit users, motorists and passengers.

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