This document is draft and has not gone through the internal editorial review process.

# **Boston Region Vision Zero Action Plan**

Appendix E: Top Municipal Crash Data Profiles





# **INSTRUCTIONS FOR MUNICIPAL PROFILES**

Page 1 uses 2018-2022 crash data from the MassDOT IMPACT Portal and public survey data to show WHAT are the key traffic safety concerns in the municipality.

This section provides an overview of the municipality based on the most recent available data, including population, Vehicle Miles Traveled (VMT), and summary crash statistics.

This section illustrates the annual variations in the number of fatal crashes and serious injury crashes recorded in the municipality from 2018 to 2022.

Section

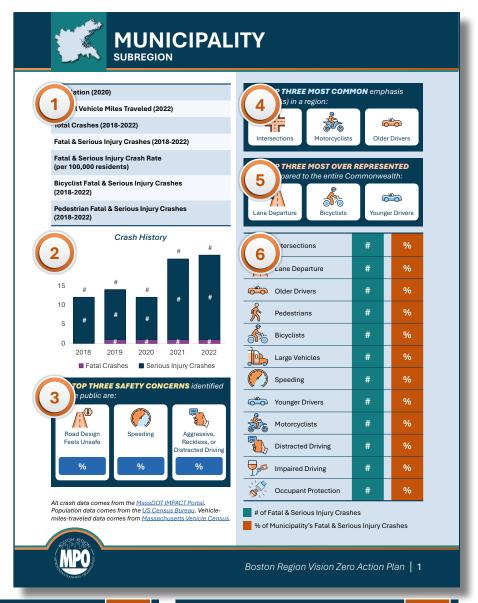
3

#### This section lists the **TOP THREE SAFETY**

**CONCERNS** related to roadway design, infrastructure, and driver behavior, as identified by the public. These three safety concerns reflect the most frequently mentioned issues in the public survey responses collected from project stakeholders in each municipality.

For each concern, the percentage of survey responses that mentioned that specific safety concern is also provided in the accompanying blue boxes.

Some municipalities either had little public feedback or no public feedback. In the case of the former, this section is replaced by select quotes from respondents. In the case of the latter, this section is removed entirely.



This section lists the TOP THREE MOST COMMON

emphasis areas in the municipality, defined as the three emphasis areas with the highest number of fatal and serious injury crashes recorded in the region from 2018 to 2022.

This section lists the **TOP THREE MOST** 

**OVER-REPRESENTED** 

emphasis areas in the municipality, defined as the three emphasis areas with the greatest statistical disparity between the municipality's crash share and the region's crash share from 2018 to 2022.

Section

Section This section lists all emphasis areas identified by the Massachusetts Highway Safety Improvement Program (HSIP). The first six emphasis areas are the six key emphasis areas in this plan, and the rest are presented in descending order based on the fatal and serious injury crash frequencies observed in the Boston Region MPO communities. For each emphasis area, the total number of these crashes and the municipality's crash share are included in the table.





#### **INSTRUCTIONS FOR MUNICIPAL PROFILES** CONTINUED

Page 2 presents the Prioritized Municipal High-Injury Network (HIN) map to indicate WHERE the most critical crash areas are located in the municipality.

This section displays the **PRIORITIZED HIGH-**INJURY NETWORK (HIN) MAP developed for the municipality. A brief explanation of the methodology used to create and prioritize the network is

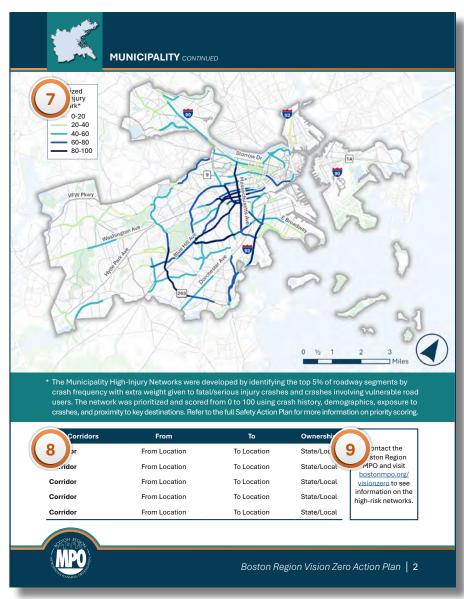
#### This section lists the **TOP FIVE CORRIDORS**

also provided.

Section

from the prioritized municipal HIN, identified based on the highest priority scores. The table includes the corridor names, from-street and to-street limits, and roadway ownership.

In addition to the HIN 9 displayed in Section 7, **HIGH-RISK NETWORKS** were also developed for the region. These are networks for each of the six key emphasis areas from the plan, where each network identifies locations that are at high-risk for each crash type. The identified areas do not necessarily have a history of crashes, but instead have a high risk for crashes. To view these networks, visit the link or contact the MPO.







#### **INSTRUCTIONS FOR MUNICIPAL PROFILES** CONTINUED

Page 3 summarizes the most critical intersection crash and segment crash issues based on 2018-2022 fatal and serious injury crash data to show select options for **HOW TO IMPROVE** transportation safety in the municipality.

This section discusses the 10 most common or most over represented intersection crash type in the municipality.

Part 10-1: This part describes the observed crash patterns for the identified intersection crash type, including its proportion of all intersection crashes, and highlights certain prominent crash risk factors and their percentages within this crash type.

Part 10-2: This part presents a sample of engineering- and infrastructure-based proven safety countermeasures designed to effectively reduce the crash risks associated with the identified intersection crash type.

For each selected countermeasure, the table lists the applicable intersection type, its Safe System Roadway Design Hierarchy Tier<sup>1</sup>, estimated cost<sup>2</sup>, and high-risk potential<sup>3</sup>.

Similar to Section 10. this section discusses the most common or most over represented segment crash type in the municipality.

Part 11-1: This part describes the observed crash patterns for the identified segment crash type, including its share of all segment crashes and associated crash risk factors.

Part 11-2: This part lists a sample of engineering- and infrastructurebased proven safety countermeasures designed to effectively reduce the crash risks associated with the identified segment crash type in the municipality.



- Safe System Roadway Design Hierarchy Tier is a tool that helps transportation agencies and practitioners identify and prioritize countermeasures and strategies when developing transportation projects based on their alignment with the Safe System Approach (SSA). It includes four tiers that are arranged from most to least aligned with the Safe System principles: Tier 1 – Remove Severe Conflicts; Tier 2 – Reduce Vehicle Speeds; Tier 3 – Manage Conflicts in Time; and Tier 4 - Increase Attentiveness and Awareness
- Estimated Cost is categorized as Low (less than \$50,000), Medium (\$50,000 to \$200,000) and High (over \$200,000) based on a selected countermeasure's estimated cost per treatment per location.
- High-Risk Potential describes how cost-effective and applicable a selected countermeasure is for widespread, proactive implementation across a road network to address common crash risks and prevent future fatal and serious injury crashes.

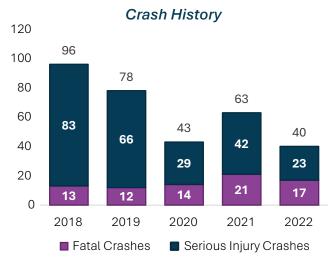




# CITY OF BOSTON

**INNER CORE COMMITTEE** 

Population (2020)	678,617
Annual Vehicle Miles Traveled (2022)	2.90B
Total Crashes (2018-2022)	10,362
Fatal & Serious Injury Crashes (2018-2022)	320
Fatal & Serious Injury Crash Rate (per 100,000 residents)	47.2
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	24
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	88



#### The TOP THREE SAFETY CONCERNS identified by the public are: Bike Lanes Do Aggressive, **Drivers Passing** Not Exist or Need Reckless, or too Close to Distracted Driving Vulnerable Improvement **Road Users** 53% **52%** 48%

All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

The City of Boston Police Department maintains their own crash records. The crash data available from MassDOT may not contain every crash. Contact the City of Boston for more extensive crash data.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in the City of Boston:













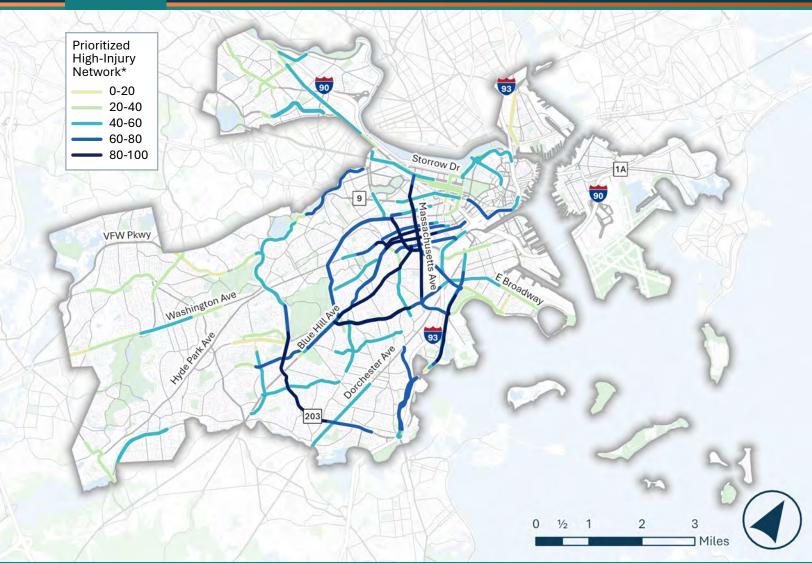
Intersections	167	52%
Lane Departure	30	9%
Older Drivers	39	12%
Pedestrians	88	28%
Bicyclists	24	8%
Large Vehicles	23	7%
Speeding	25	8%
Younger Drivers	29	9%
Motorcyclists	32	10%
Distracted Driving	19	6%
Impaired Driving	16	5%
Occupant Protection	15	5%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





# **CITY OF BOSTON** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Massachusetts Ave	Columbus Ave	Melnea Cass Blvd	Local
Massachusetts Ave	Melnea Cass Blvd	Enterprise St	Local
Harrison Ave	E Canton St	Warren Pl	Local
Blue Hill Ave	Brookford St	Seaver St	Local
Morton St	Harvard St	Circuit Dr	State





# SIGNALIZED INTERSECTION CRASHES



**62%** of intersection fatal and serious injury crashes in Boston occurred at signalized intersections between 2018 and 2022.



**75%** 

occurred at four-way signalized intersections



36%

involved a left-turning vehicle



22%

involved drivers disregarding traffic signs, signals, road markings

Note: Percentages only apply to signalized intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium
Roundabouts	Intersections in both rural and urban areas	Remove severe conflicts; reduce vehicle speeds	High	Low

#### PEDESTRIAN-INVOLVED SEGMENT CRASHES



Crashes involving people walking accounted for 29% of Boston's segment fatal and serious injury crashes.



52%

occurred on two-way undivided roadways



50%

happened in dark conditions



**52%** 

occurred while pedestrians were stepping into or crossing travel lanes

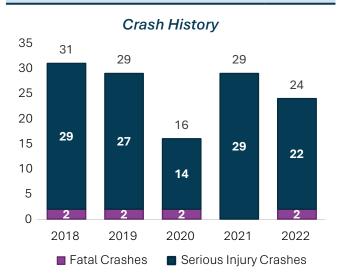
Note: Percentages only apply to pedestrian-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Medians and pedestrian refuge islands	Curbed sections of urban and suburban multilane roadways	Remove severe conflicts; reduce vehicle speeds	Low	High
Improved lighting	All types of roadway segments	Increase attentiveness and awareness	Low	High
Rectangular rapid flashing beacons (RRFB)	Multilane crossings with speed limits less than 40 miles per hour	Increase attentiveness and awareness	Low to medium	High
Pedestrian hybrid beacons	Higher-speed roadways at midblock crossings	Manage conflicts in time	Medium	High
Walkways	All types of roadway segments except controlled access	Remove severe conflicts	Medium to high	High





Population (2020)	118,395
Annual Vehicle Miles Traveled (2022)	357.8M
Total Crashes (2018-2022)	6,872
Fatal & Serious Injury Crashes (2018-2022)	129
Fatal & Serious Injury Crash Rate (per 100,000 residents)	109.0
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	29
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	42





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from <u>Massachusetts Vehicle Census</u>.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Cambridge:













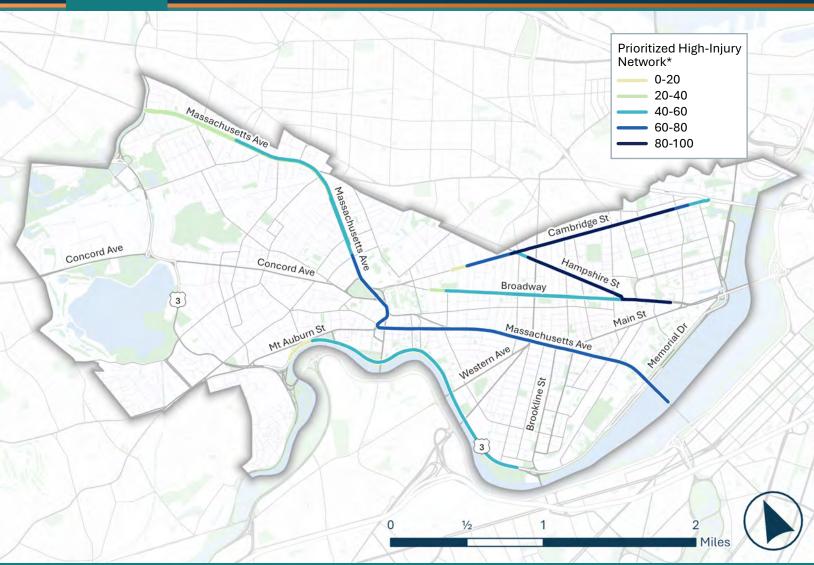
Intersections	66	51%
Lane Departure	9	7%
Older Drivers	18	14%
Pedestrians	42	33%
Bicyclists	29	22%
Large Vehicles	11	9%
Speeding	5	4%
Younger Drivers	5	4%
Motorcyclists	5	4%
Distracted Driving	7	5%
Impaired Driving	6	5%
Occupant Protection	3	2%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **CAMBRIDGE** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Hampshire St	Amory St	Broadway	Local
Cambridge St	Ellsworth Ave	Third St	Local
Massachusetts Ave	Prospect St	Charles River	Local
Massachusetts Ave	Putnam Ave	Prospect St	Local
Mt Auburn St	Brattle Square	Massachusetts Ave	Local



#### PEDESTRIAN-INVOLVED **INTERSECTION CRASHES**



**36%** of intersection fatal and serious injury crashes in Cambridge involved pedestrians between 2018 and 2022.



38%

occurred at signalized intersections



38%

happened in dark conditions



33%

involved a left-turning vehicle

Note: Percentages only apply to pedestrian-involved intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Leading pedestrian interval	Signalized intersections	Manage conflicts in time	Low	High
Crosswalk visibility enhancements	All types of intersections	Increase attentiveness and awareness	Low	High
Curb extensions	All types of intersections	Reduce vehicle speeds	Low to medium	Medium
Improved lighting	All types of intersections	Increase attentiveness and awareness	Low	High

#### **BICYCLIST-INVOLVED SEGMENT CRASHES**



Crashes involving people biking accounted for 23% of Cambridge's segment fatal and serious injury crashes.



**57**%

occurred on two-way undivided roadways



50%

involved a vehicle slowing or stopped in traffic



43%

occurred when bicyclists were cycling in the roadway

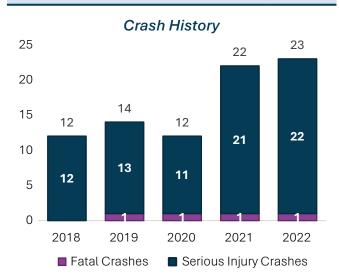
Note: Percentages only apply to bicyclist-involved segment fatal and serious injury crashes.

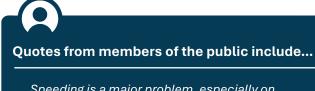
Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Road diets	Roadways with average daily traffic of 25,000 or less	Remove severe conflicts; reduce vehicle speeds	Low	Medium
Bicycle lanes	Roadways where adjacent land use suggests that trips could be served by varied modes	Remove severe conflicts	Medium to high	Low





Population (2020)	40,784
Annual Vehicle Miles Traveled (2022)	451.3M
Total Crashes (2018-2022)	3,557
Fatal & Serious Injury Crashes (2018-2022)	83
Fatal & Serious Injury Crash Rate (per 100,000 residents)	203.5
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	7
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	25





Speeding is a major problem, especially on wider roads around the Tobin Bridge, Marginal Street, and Eastern Avenue.

> Chelsea is effectively an island from a pedestrian standpoint.

All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from <u>Massachusetts Vehicle Census</u>.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Chelsea:











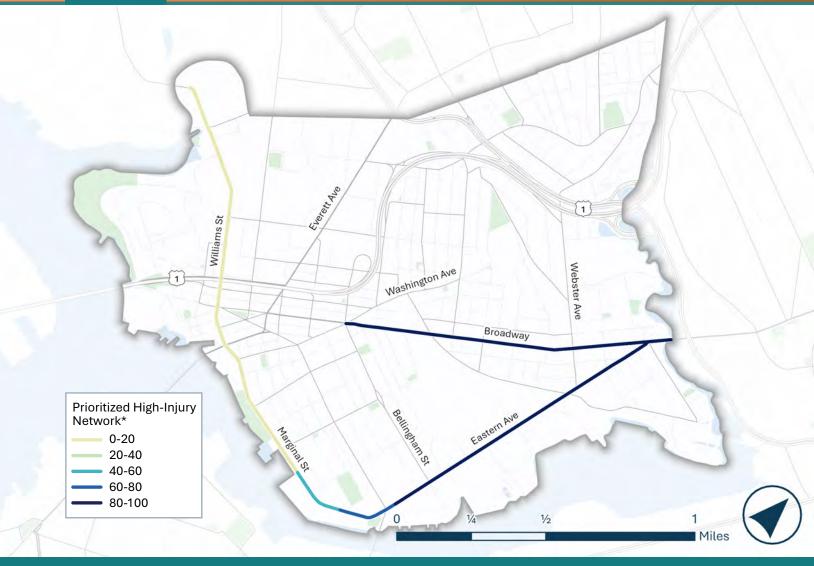


	Intersections	40	48%
	Lane Departure	6	7%
	Older Drivers	10	12%
, i	Pedestrians	25	30%
	Bicyclists	7	8%
	Large Vehicles	7	8%
	Speeding	1	1%
, m	Younger Drivers	11	13%
	Motorcyclists	8	10%
	Distracted Driving	4	5%
	Impaired Driving	4	5%
	Occupant Protection	1	1%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes







\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Eastern Ave	Broadway	Webster Ave	Local
Broadway	Clinton St	Washington Ave	Local
Eastern Ave	Webster Ave	Central Ave	Local
Marginal St	Central Ave	Andrew McArdle Brg	Local
Williams St/Beacham St	Andrew McArdle Brg	Riley Way	Local





#### **HEAD-ON CRASHES AT INTERSECTIONS**



**18%** of intersection fatal and serious injury crashes in Chelsea were head-on crashes between 2018 and 2022.



71%

occurred at T-intersections

43%

happened in dark conditions



57%

involved a left-turning vehicle

Note: Percentages only apply to head-on intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Protected left turn phasing	Signalized intersections with relatively high left turn volumes	Remove severe conflicts	Low	High
Offset left-turn lanes at intersections	Intersections with a high frequency of crashes between vehicles turning left and opposing through vehicles	Remove severe conflicts	Medium	Medium
Roundabouts	Intersections in both rural and urban areas	Remove severe conflicts; reduce vehicle speeds	High	Low

#### SIDESWIPE CRASHES ON SEGMENTS



Sideswipe crashes accounted for **22%** of Chelsea's segment fatal and serious injury crashes.



67%

occurred on two-way undivided roadways



were sideswipe crashes in the

56%



44%

involved a parked vehicle

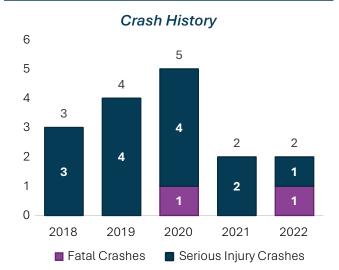
Note: Percentages only apply to sideswipe-involved segment fatal and serious injury crashes.

same direction

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Pavement marking improvement	All types of roadway segments	Increase attentiveness and awareness	Low	High
Medians	Urban and suburban multilane roadway segments	Remove severe conflicts; reduce vehicle speeds	Low	High
Speed humps	Low-speed local and collector streets	Reduce vehicle speeds	Low	High
Reduce density through driveway closure, consolidation, or relocation (Corridor Access Management )	All types of roadway segments	Remove severe conflicts	High	Low



Population (2020)	5,924
Annual Vehicle Miles Traveled (2022)	52.4M
Total Crashes (2018-2022)	445
Fatal & Serious Injury Crashes (2018-2022)	16
Fatal & Serious Injury Crash Rate (per 100,000 residents)	270.1
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	1
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	0





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Dover:















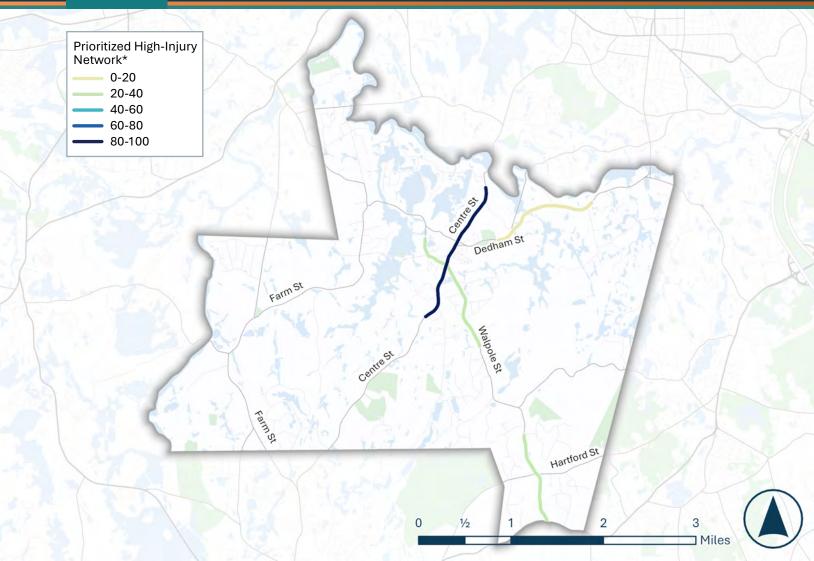
1000			
	Intersections	4	25%
	Lane Departure	9	56%
	Older Drivers	5	31%
, Š	Pedestrians	0	0%
150 m	Bicyclists	1	6%
	Large Vehicles	1	6%
	Speeding	1	6%
	Younger Drivers	3	19%
	Motorcyclists	2	13%
	Distracted Driving	2	13%
	Impaired Driving	0	0%
	Occupant Protection	0	0%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **DOVER** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Centre St	Claybrook Rd	Springdale Ave	Local
Centre St	Springdale Ave	Pine St	Local
Springdale Ave	Church St	Centre St	Local
Walpole St	Centre St	Woodland Rd	Local
Walpole St	Shady Ln	County St	Local





#### ANGLE CRASHES AT INTERSECTIONS



**50%** of intersection fatal and serious injury crashes in Dover were angle crashes between 2018 and 2022.



occurred at four-way stop-controlled

intersections



100%

happened in daylight conditions



**50%** 

involved driver disregarding traffic signs and road markings

Note: Percentages only apply to angle intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Enhanced signing and delineation	Unsignalized intersections	Increase attentiveness and awareness	Low	High
Advanced intersection warning signs	Approach lanes of intersections	Increase attentiveness and awareness	Low	High
Transverse rumble strips	Approach lanes of intersections	Reduce vehicle speeds; increase attentiveness and awareness	Medium	High

# LANE DEPARTURE CRASHES ON SEGMENTS (FIXED OBJECTS)



Fixed object lane departure crashes accounted for 50% of Dover's segment fatal and serious injury crashes.



83%

occurred on two-way undivided roadways



50%

were collisions with trees



33%

involved a young driver (aged 24 and under)

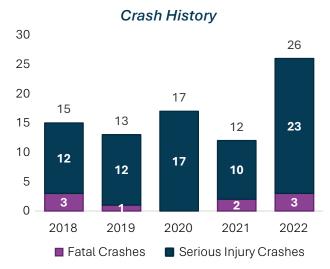
Note: Percentages only apply to lane departure (fixed object)involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Shoulder and edge line rumble strips and stripes	All types of roadway segments	Increase attentiveness and awareness	Low	High
Enhanced curve delineation	Horizontal curves	Increase attentiveness and awareness	Low	High
SafetyEdge	All types of roadway segments	Remove severe conflicts	Low	High
Clear zone improvements (e.g., removal of shrubs and trees)	Horizontal curves	Remove severe conflicts	Low to high	High





Population (2020)	72,377
Annual Vehicle Miles Traveled (2022)	582.1M
Total Crashes (2018-2022)	6,494
Fatal & Serious Injury Crashes (2018-2022)	83
Fatal & Serious Injury Crash Rate (per 100,000 residents)	114.7
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	4
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	19





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Framingham:













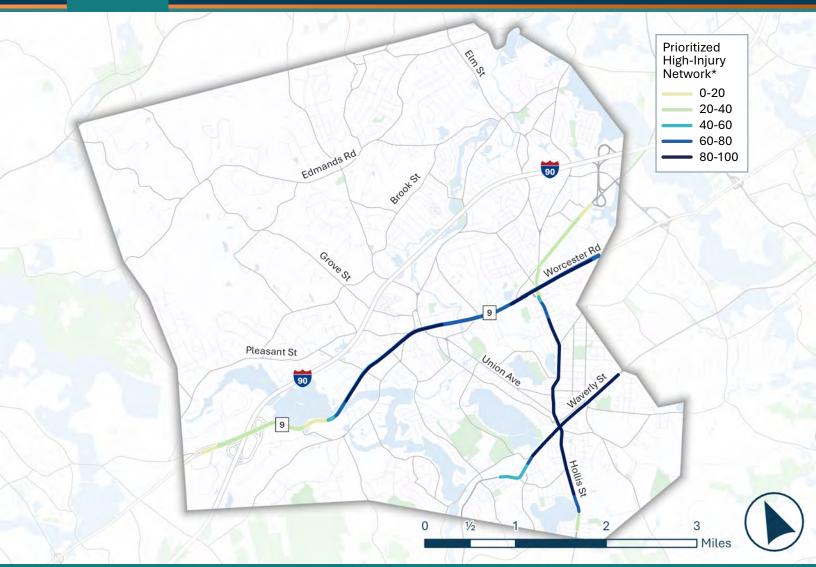
Intersections	41	49%
Lane Departure	8	10%
Older Drivers	10	12%
Pedestrians	19	23%
Bicyclists	4	5%
Large Vehicles	3	4%
Speeding	9	11%
Younger Drivers	6	7%
Motorcyclists	13	16%
Distracted Driving	2	2%
Impaired Driving	5	6%
Occupant Protection	3	4%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **FRAMINGHAM** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Concord St	Normandy Rd	Waverly St	Local
Waverly St	Fountain St	2nd St	Local
Worcester Rd	Foss Reservoir	Main St	State
Hollis St	Waverly St	Andrew St	Local
Worcester Rd	Cochituate Rd	Shoppers World Dr	State



#### **TURNING MOVEMENT-RELATED INTERSECTION CRASHES**



**54%** of intersection fatal and serious injury crashes in Framingham involved turning movement between 2018 and 2022.



68%

occurred at signalized intersections



41%

happened in dark conditions



95%

involved a left-turning vehicle

Note: Percentages only apply to turning movement-related intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Yellow change intervals	Signalized intersections	Manage conflicts in time	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium

#### SPEEDING-RELATED SEGMENT CRASHES



Speeding-related crashes accounted for **15%** of Framingham's segment fatal and serious injury crashes.



67%

occurred on two-way undivided roadways



67%

were single-vehicle crashes



**17%** 

happened on roadways with posted speed limits greater than 40 mph

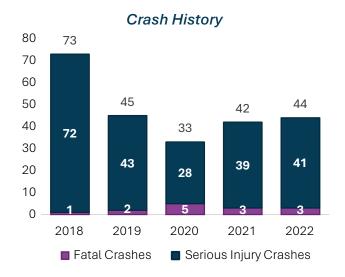
Note: Percentages only apply to speeding related-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Speed humps	Low-speed local and collector streets	Reduce vehicle speeds	Low	High
Variable speed limits	Urban and rural freeways and high-speed arterials with posted speed limits greater than 40 mph	Reduce vehicle speeds; Increase attentiveness and awareness	Low	High
Speed feedback signs	All types of roadway segments	Increase attentiveness and awareness	Low	High





Population (2020)	101,264
Annual Vehicle Miles Traveled (2022)	563.5M
Total Crashes (2018-2022)	9,363
Fatal & Serious Injury Crashes (2018-2022)	237
Fatal & Serious Injury Crash Rate (per 100,000 residents)	234.0
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	13
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	60





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Lynn:











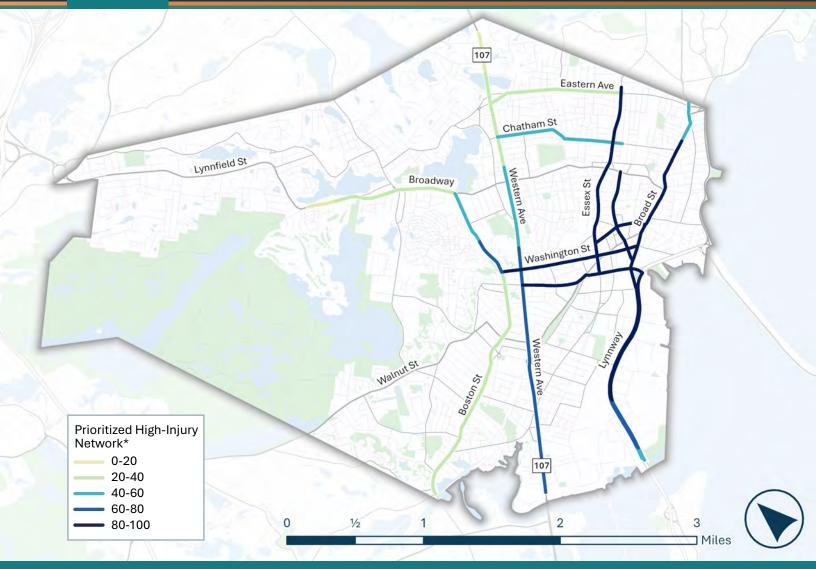


Intersections	124	<b>52</b> %
Lane Departure	22	9%
Older Drivers	35	15%
Pedestrians	60	25%
Bicyclists	13	5%
Large Vehicles	9	4%
Speeding	7	3%
Younger Drivers	28	12%
Motorcyclists	23	10%
Distracted Driving	3	1%
Impaired Driving	4	2%
Occupant Protection	16	7%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes







\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Washington St	Western Ave	Broad St	Local
Liberty St	Market St	Baldwin St	Local
Essex St	Baldwin St	Porter St	Local
Lynnway	Shepard St	Market St	State
Broad St	Market St	Nahant St	Local





#### PEDESTRIAN-INVOLVED **INTERSECTION CRASHES**



**25%** of intersection fatal and serious injury crashes in Lynn involved pedestrians between 2018 and 2022.



48%

occurred at signalized intersections



32%

happened in dark conditions



32%

involved a left-turning vehicle

Note: Percentages only apply to pedestrian-involved intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Leading pedestrian interval	Signalized intersections	Manage conflicts in time	Low	High
Crosswalk visibility enhancements	All types of intersections	Increase attentiveness and awareness	Low	High
Improved lighting	All types of intersections	Increase attentiveness and awareness	Low	High
Curb extensions	All types of intersections	Reduce vehicle speeds	Low to medium	Medium

#### **HEAD-ON CRASHES ON SEGMENTS**



Head-on crashes accounted for **15%** of Lynn's segment fatal and serious injury crashes.



**76%** 

occurred on two-way undivided roadways

71% happened on

were caused by driver failure to keep in lane or running off road

24%

Note: Percentages only apply to head-on-involved segment fatal and serious injury crashes.

roadways with

posted speed limits

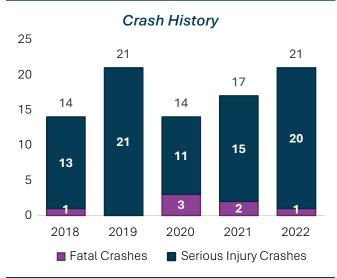
lower than 35 mph

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Center line rumble strips and stripes	Undivided roadway segments	Increase attentiveness and awareness	Low	High
SafetyEdge	All types of roadway segments	Remove severe conflicts	Low	High
Median barriers	Divided roadway segments	Remove severe conflicts	Medium	Medium





Population (2020)	66,271
Annual Vehicle Miles Traveled (2022)	345.9M
Total Crashes (2018-2022)	4,157
Fatal & Serious Injury Crashes (2018-2022)	87
Fatal & Serious Injury Crash Rate (per 100,000 residents)	131.3
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	3
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	21





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Malden:









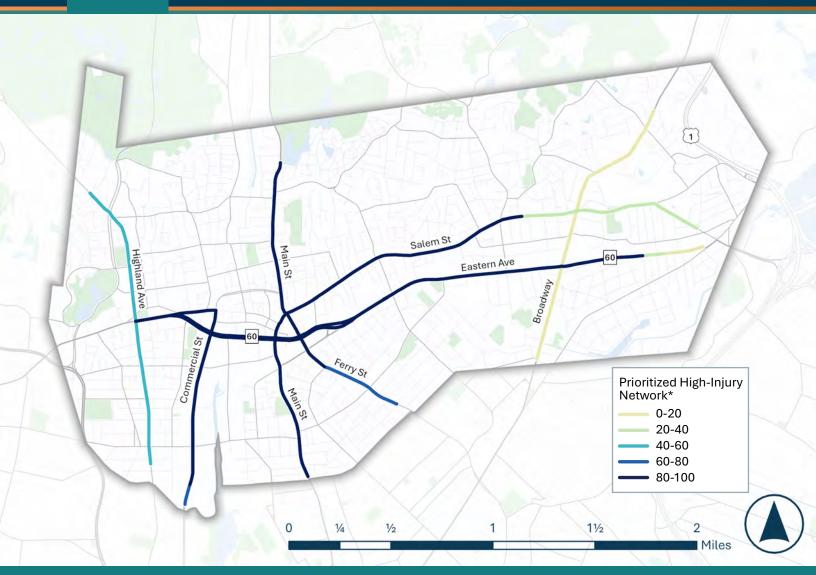




Intersections	52	60%
Lane Departure	6	7%
Older Drivers	11	13%
Pedestrians	21	24%
Bicyclists	3	3%
Large Vehicles	2	2%
Speeding	1	1%
Younger Drivers	6	7%
Motorcyclists	9	10%
Distracted Driving	3	3%
Impaired Driving	3	3%
Occupant Protection	7	8%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Main St	Medford St	Centre St	Local
Main St	Centre St	Park Ave	Local
Salem St	Main St	Branch St	Local
Commercial St	Medford St	Pleasant St	Local
Eastern Ave	Centre St	Broadway	Local





#### SIGNALIZED INTERSECTION CRASHES



**58%** of intersection fatal and serious injury crashes in Malden occurred at signalized intersections between 2018 and 2022.



46%

occurred at four-way signalized intersections



37%

happened in dark conditions



29%

involved a left-turning vehicle

Note: Percentages only apply to signalized intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium
Roundabouts	Intersections in both rural and urban areas	Remove severe conflicts; Reduce vehicle speeds	High	Low

#### PEDESTRIAN-INVOLVED SEGMENT CRASHES



Crashes involving people walking accounted for **27%** of Malden's segment fatal and serious injury crashes.



56%

occurred on two-way undivided roadways



33%

occurred while pedestrians were walking or running in travel lanes



11%

involved driver disregarding traffic signs and road markings

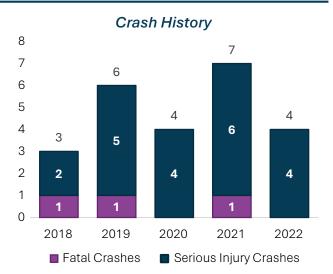
Note: Percentages only apply to pedestrian-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Medians and pedestrian refuge islands	Curbed sections of urban and suburban multilane roadways	Remove severe conflicts; reduce vehicle speeds	Low	High
Improved lighting	All types of roadway segments	Increase attentiveness and awareness	Low	High
Rectangular rapid flashing beacons (RRFB)	Multilane crossings with speed limits less than 40 miles per hour	Increase attentiveness and awareness	Low to medium	High
Walkways	All types of roadway segments except controlled access	Remove severe conflicts	Medium to high	High





Population (2020)	9,780
Annual Vehicle Miles Traveled (2022)	93.9M
Total Crashes (2018-2022)	898
Fatal & Serious Injury Crashes (2018-2022)	24
Fatal & Serious Injury Crash Rate (per 100,000 residents)	245.4
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	0
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	3





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Middleton:















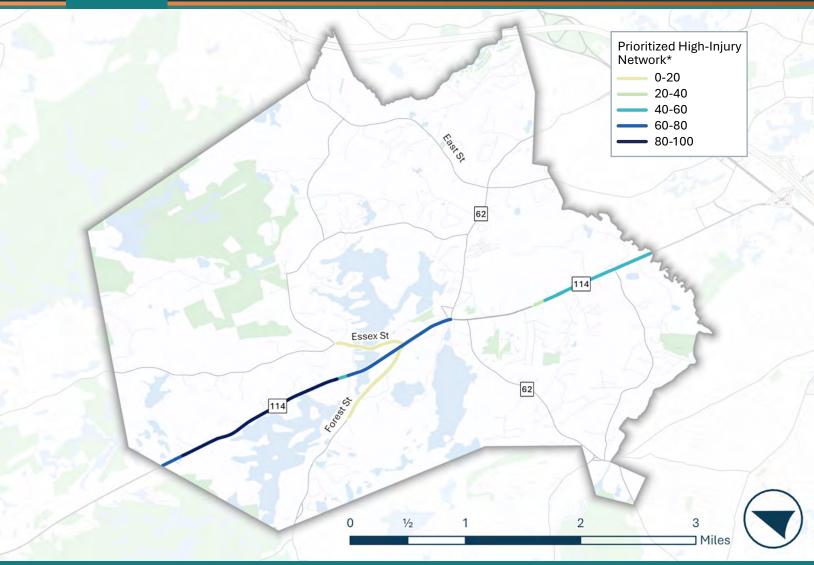
	Intersections	3	13%
	Lane Departure	11	46%
	Older Drivers	4	17%
- Š	Pedestrians	3	13%
57b	Bicyclists	0	0%
	Large Vehicles	2	8%
	Speeding	1	4%
	Younger Drivers	3	13%
	Motorcyclists	3	13%
	Distracted Driving	2	8%
	Impaired Driving	3	13%
	Occupant Protection	0	0%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





# MIDDLETON CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
N Main St	Rockaway Rd	Lake St	State
N Main St	Lake St	Maple St	State
S Main St	Meadows Dr	Ipswich River	State
Forest St	Old Hundred Ln	N Main St	Local
Essex St	N Main St	School St	Local



#### **MIDDLETON** CONTINUED

#### ANGLE CRASHES AT INTERSECTIONS



**ALL** intersection fatal and serious injury crashes in Middleton were angle crashes between 2018 and 2022.



67%

occurred at four-way signalized intersections



33%

happened in dark conditions



33%

involved a left-turning vehicle

Note: Percentages only apply to angle intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Enhanced signing and delineation	Unsignalized intersections	Increase attentiveness and awareness	Low	High
Transverse rumble strips	Approach lanes of intersections	Reduce vehicle speeds; increase attentiveness and awareness	Medium	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium

#### **SEGMENT CRASHES INVOLVING VEHICLE ENTERING/LEAVING TRAFFIC LANES**



Crashes involving vehicle entering or leaving traffic lanes accounted for 14% of Middleton's segment fatal and serious injury crashes



67%

occurred on two-way undivided roadways



33%

were sideswipe crashes in the opposite direction



33%

involved driver failure to yield right-of-way

Note: Percentages only apply to vehicle entering/leaving traffic lanes-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Medians	Urban and suburban multilane roadway segments	Remove severe conflicts; reduce vehicle speeds	Low	High
Limit allowable movements at driveways (Corridor Access Management)	All types of roadway segments	Remove severe conflicts	Low	High
Reduce density through driveway closure, consolidation, or relocation (Corridor Access Management )	All types of roadway segments	Remove severe conflicts	High	Low



Population (2020)	8,459
Annual Vehicle Miles Traveled (2022)	79.8M
Total Crashes (2018-2022)	478
Fatal & Serious Injury Crashes (2018-2022)	21
Fatal & Serious Injury Crash Rate (per 100,000 residents)	248.3
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	0
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	1

#### **Crash History** 7 6 6 6 5 4 4 4 3 6 6 3 2 1 1 0 2018 2019 2020 2022 2021 ■ Fatal Crashes Serious Injury Crashes



All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from <u>Massachusetts Vehicle Census</u>.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Millis:















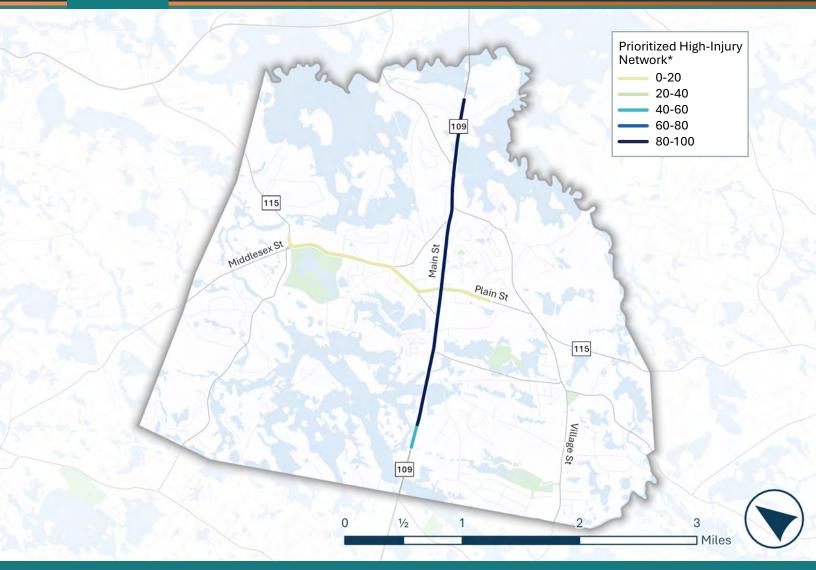
Intersections	6	29%
Lane Departure	9	43%
Older Drivers	5	24%
Pedestrians	1	5%
Bicyclists	0	0%
Large Vehicles	2	10%
Speeding	0	0%
Younger Drivers	3	14%
Motorcyclists	3	14%
Distracted Driving	2	10%
Impaired Driving	3	14%
Occupant Protection	1	5%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes









\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Main St	Bridge St	Village St	Local
Main St	Village St	Plain St	Local
Main St	Plain St	Oakland St	Local
Plain St	Orchard St	Main St	Local
Plain St	Main St	Millis High School	Local





#### **REAR-END CRASHES AT INTERSECTIONS**



**33%** of intersection fatal and serious injury crashes in Millis were rear-end crashes between 2018 and 2022.



50%

occurred at stop-controlled T-intersections



**50%** 

involved driver failure to yield right-of-way



50%

involved a young driver (aged 24 and under)

Note: Percentages only apply to rear-end intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Advanced intersection warning signs	Approach lanes of intersections	Increase attentiveness and awareness	Low	High
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Transverse rumble strips	Approach lanes of unsignalized intersections	Reduce vehicle speeds; increase attentiveness and awareness	Medium	High

#### **LANE DEPARTURE CRASHES** ON SEGMENTS (FIXED OBJECTS)



Fixed object lane departure crashes accounted for 40% of Millis's segment fatal and serious injury crashes.



83%

occurred on two-way undivided roadways



67%

were collisions with trees



**17%** 

involved impaired driving

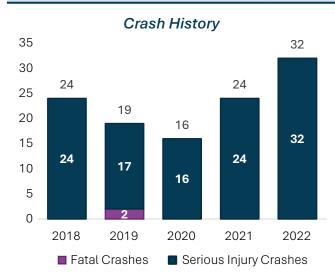
Note: Percentages only apply to lane departure (fixed object)involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Shoulder and edge line rumble strips and stripes	All types of roadway segments	Increase attentiveness and awareness	Low	High
Enhanced curve delineation	Horizontal curves	Increase attentiveness and awareness	Low	High
SafetyEdge	All types of roadway segments	Remove severe conflicts	Low	High
Clear Zone improvements (e.g., removal of shrubs and trees)	Horizontal curves	Remove severe conflicts	Low to high	High





Population (2020)	88,950
Annual Vehicle Miles Traveled (2022)	489.0M
Total Crashes (2018-2022)	6,016
Fatal & Serious Injury Crashes (2018-2022)	115
Fatal & Serious Injury Crash Rate (per 100,000 residents)	129.3
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	17
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	21





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Newton:













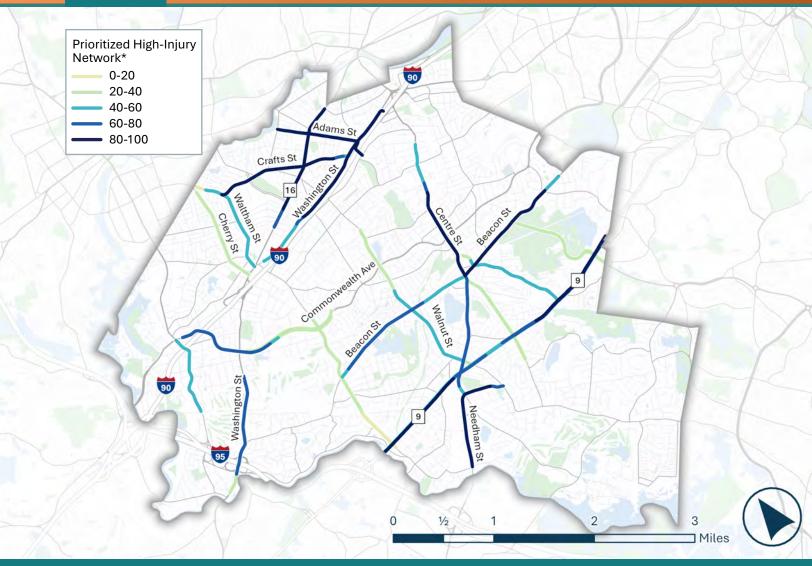
Intersections	62	54%
Lane Departure	16	14%
Older Drivers	30	26%
Pedestrians	21	18%
Bicyclists	17	15%
Large Vehicles	5	4%
Speeding	3	3%
Younger Drivers	3	3%
Motorcyclists	11	10%
Distracted Driving	4	3%
Impaired Driving	8	7%
Occupant Protection	4	3%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **NEWTON** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Centre St	Beacon St	Cotton St	Local
Adams St & Lewis Ter	Newtonville Ave	California St	Local
Boylston St	Quinobequin Rd	Winchester St	State
Beacon St	Centre St	Hammond Pond Pkwy	Local
Boylston St	Dudley Rd	Hammond Pond Pkwy	State





# **BICYCLIST-INVOLVED INTERSECTION CRASHES**



**24%** of intersection fatal and serious injury crashes in Newton involved bicyclists between 2018 and 2022.



33%

occurred at four-way signalized intersections



47%

involved a left-turning vehicle



13%

involved driver failure to yield right-of-way

Note: Percentages only apply to bicyclist-involved intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Bike box at intersection (advance stop bar)	Intersections with high bicycle volumes	Remove severe conflicts; increase attentiveness and awareness	Low	High
Right turn on red restrictions	Intersections with high bicycle volumes and conflicts with right-turning vehicles	Manage conflicts in time	Low	High
Improved lighting	All types of intersections	Increase attentiveness and awareness	Low	High

#### PEDESTRIAN-INVOLVED SEGMENT CRASHES



Crashes involving people walking accounted for 32% of Newton's segment fatal and serious injury crashes.



94%

occurred on two-way undivided roadways



happened in dark conditions



29%

occurred while pedestrians were walking or running in travel lanes

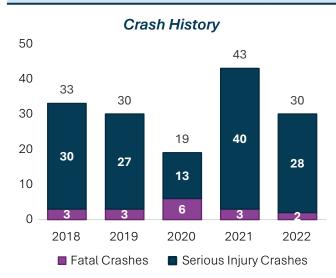
Note: Percentages only apply to pedestrian-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Medians and pedestrian refuge islands	Curbed sections of urban and suburban multilane roadways	Remove severe conflicts; reduce vehicle speeds	Low	High
Improved lighting	All types of roadway segments	Increase attentiveness and awareness	Low	High
Rectangular rapid flashing beacons (RRFB)	Multilane crossings with speed limits less than 40 miles per hour	Increase attentiveness and awareness	Low to medium	High
Walkways	All types of roadway segments except controlled access	Remove severe conflicts	Medium to high	High





Population (2020)	101,614
Annual Vehicle Miles Traveled (2022)	581.5M
Total Crashes (2018-2022)	8,622
Fatal & Serious Injury Crashes (2018-2022)	155
Fatal & Serious Injury Crash Rate (per 100,000 residents)	152.5
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	4
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	52





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Quincy:













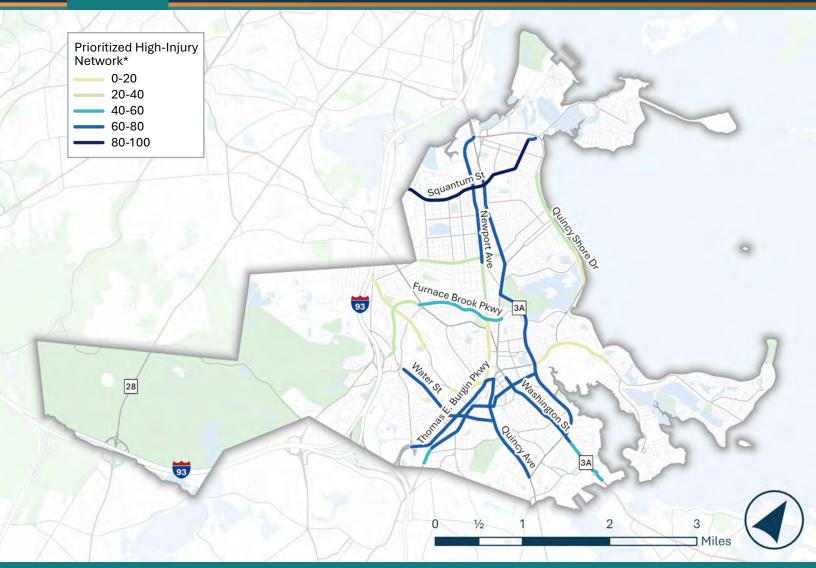
	Intersections	69	45%
	Lane Departure	29	19%
	Older Drivers	27	17%
Ř	Pedestrians	52	34%
<b>5</b>	Bicyclists	4	3%
	Large Vehicles	5	3%
	Speeding	11	7%
(N)	Younger Drivers	9	6%
	Motorcyclists	12	8%
	Distracted Driving	9	6%
	Impaired Driving	7	5%
70	Occupant Protection	8	5%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





# **QUINCY** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership	
E Squantum St	Edgeworth Rd	Newport Ave Extension	Local	
W Squantum St	Newport Ave Extension	London Ave	Local	
Hancock St	E Squantum St	Merrymount Pkwy	Local	
Thomas E Burgin Pkwy	Centre St	Hancock St	Local	
Newport Avenue Ext	Hancock St	Wilson Ave	Local	





#### PEDESTRIAN-INVOLVED **INTERSECTION CRASHES**



**36%** of intersection fatal and serious injury crashes in Quincy involved pedestrians between 2018 and 2022.



68%

occurred at signalized intersections



56%

happened in dark conditions



16%

involved a left-turning vehicle

Note: Percentages only apply to pedestrian-involved intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Leading pedestrian interval	Signalized intersections	Manage conflicts in time	Low	High
Crosswalk visibility enhancements	All types of intersections	Increase attentiveness and awareness	Low	High
Improved lighting	All types of intersections	Increase attentiveness and awareness	Low	High
Curb extensions	All types of intersections	Reduce vehicle speeds	Low to medium	Medium

# LANE DEPARTURE CRASHES ON SEGMENTS (FIXED OBJECTS)



Fixed object lane departure crashes accounted for 20% of Quincy's segment fatal and serious injury crashes.



59%

occurred on two-way undivided roadways



were collisions with curb



12%

involved distracted driving

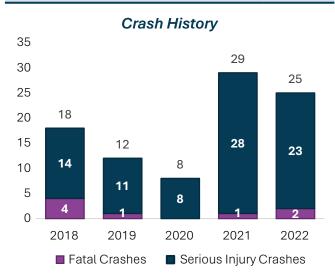
Note: Percentages only apply to lane departure (fixed objects)involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Shoulder and edge line rumble strips and stripes	All types of roadway segments	Increase attentiveness and awareness	Low	High
Enhanced curve delineation	Horizontal curves	Increase attentiveness and awareness	Low	High
SafetyEdge	All types of roadway segments	Remove severe conflicts	Low	High
Clear zone improvements (e.g., removal of shrubs and trees)	Horizontal curves	Remove severe conflicts	Low to high	High





Population (2020)	62,208
Annual Vehicle Miles Traveled (2022)	336.0M
Total Crashes (2018-2022)	3,043
Fatal & Serious Injury Crashes (2018-2022)	92
Fatal & Serious Injury Crash Rate (per 100,000 residents)	147.9
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	2
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	29





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Revere:













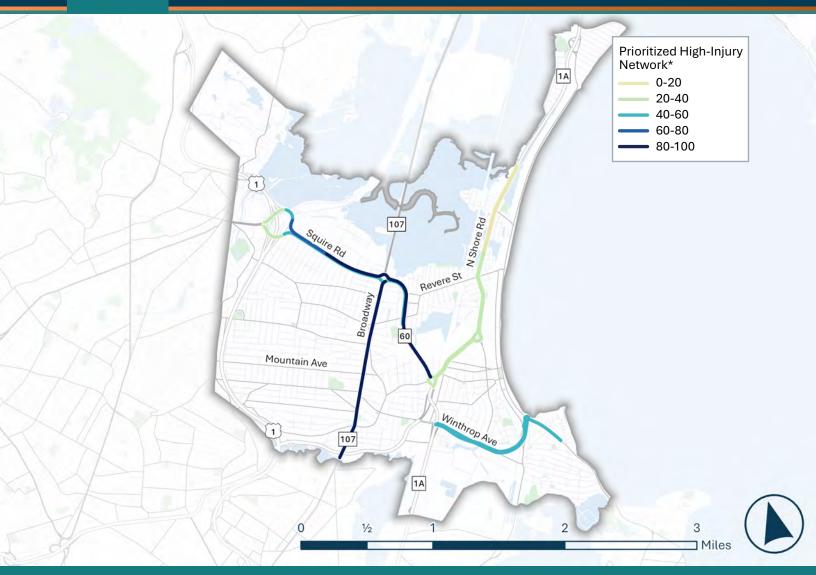
Intersections	31	34%
Lane Departure	20	22%
Older Drivers	12	13%
Pedestrians	29	32%
Bicyclists	2	2%
Large Vehicles	0	0%
Speeding	7	8%
Younger Drivers	6	7%
Motorcyclists	11	12%
Distracted Driving	5	5%
Impaired Driving	9	10%
Occupant Protection	2	2%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **REVERE** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Broadway	Squire Rd	Revere Beach Pkwy	Local
American Legion Hwy Northbound	Beach St	Broadway	State
Squire Rd Westbound	Broadway	US Route 1	State
Squire Rd Eastbound	US Route 1	Broadway	State
Revere Beach Pkwy	Lee Burbank Hwy	Winthorp Pkwy	DCR





#### SIGNALIZED INTERSECTION CRASHES



**74%** of intersection fatal and serious injury crashes in Revere occurred at signalized intersections between 2018 and 2022.



46%

occurred at four-way signalized intersections



35%

involved a left-turning vehicle



26%

involved drivers disregarding traffic signs, signals, road markings

Note: Percentages only apply to signalized intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium
Roundabouts	Intersections in both rural and urban areas	Remove severe conflicts; reduce vehicle speeds	High	Low

#### SPEEDING-RELATED SEGMENT CRASHES



Speeding-related crashes accounted for **10%** of Revere's segment fatal and serious injury crashes.



67%

occurred on two-way divided roadways with positive median barriers



67%

happened on roadways with posted speed limits lower than 40 mph



50%

were single-vehicle crashes

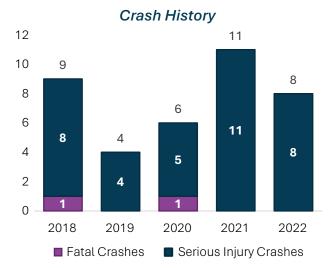
Note: Percentages only apply to speeding related-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Speed humps	Low-speed local and collector streets	Reduce vehicle speeds	Low	High
Variable speed limits	Urban and rural freeways and high-speed arterials with posted speed limits greater than 40 mph	Reduce vehicle speeds; increase attentiveness and awareness	Low	High
Speed feedback signs	All types of roadway segments	Increase attentiveness and awareness	Low	High





Population (2020)	17,804
Annual Vehicle Miles Traveled (2022)	164.8M
Total Crashes (2018-2022)	1,056
Fatal & Serious Injury Crashes (2018-2022)	38
Fatal & Serious Injury Crash Rate (per 100,000 residents)	213.4
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	0
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	5





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Rockland:













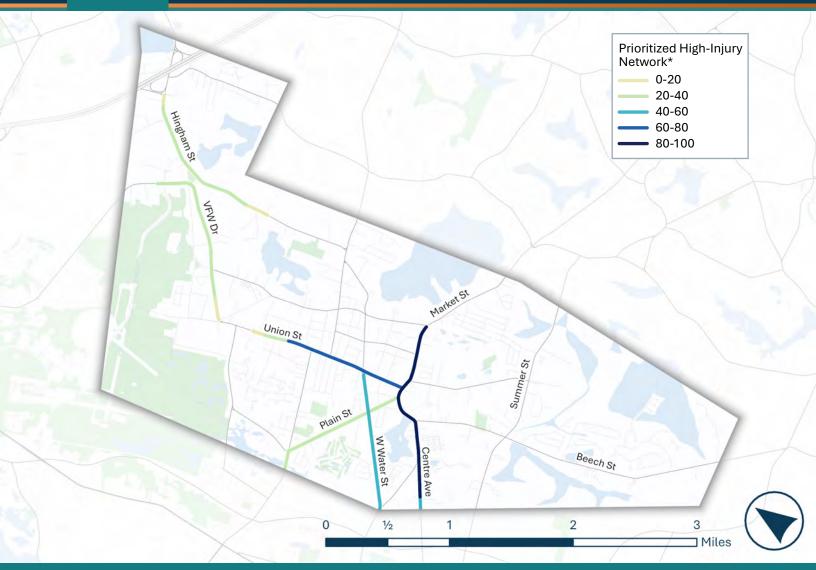
Intersections	19	50%
Lane Departure	10	26%
Older Drivers	5	13%
Pedestrians	5	13%
Bicyclists	0	0%
Large Vehicles	3	8%
Speeding	2	5%
Younger Drivers	3	8%
Motorcyclists	4	11%
Distracted Driving	2	5%
Impaired Driving	4	11%
Occupant Protection	6	16%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **ROCKLAND** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Market St	Spring St	Liberty St	State
Centre Ave	Spring St	Bradford St	State
Union St	Market St	Biglow Ave	Local
W Water St	Central St	Union St	Local
Plain St	Market St	North Ave	Local



# SIDESWIPE CRASHES AT INTERSECTIONS



21% of intersection fatal and serious injury crashes in Rockland were sideswipe crashes between 2018 and 2022.



50%

occurred at four-way signalized intersections



25%

involved drivers disregarding traffic signs, signals, road markings



25%

involved a left-turning vehicle

Note: Percentages only apply to sideswipe intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Enhanced signing and delineation	Unsignalized intersections	Increase attentiveness and awareness	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium

#### **OVERTAKING-INVOLVED SEGMENT CRASHES**



Overtaking-involved crashes accounted for **11%** of Rockland's segment fatal and serious injury crashes.



**50%** 

occurred on two-way undivided roadways



50%

50%

involved impaired driving

Note: Percentages only apply to overtaking-involved segment fatal and serious injury crashes.

were head-on

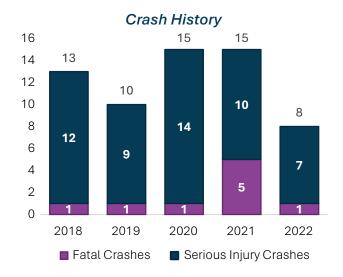
crashes

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Speed humps	Low-speed local and collector streets	Reduce vehicle speeds	Low	High
Speed feedback signs	All types of roadway segments	Increase attentiveness and awareness	Low	High
Road diets	Roadways with average daily traffic of 25,000 or less	Remove severe conflicts; Reduce vehicle speeds	Low	Medium





Population (2020)	28,616
Annual Vehicle Miles Traveled (2022)	224.6M
Total Crashes (2018-2022)	2,593
Fatal & Serious Injury Crashes (2018-2022)	61
Fatal & Serious Injury Crash Rate (per 100,000 residents)	213.2
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	1
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	8





Quotes from members of the public include...

Road lines are not visible due to overgrown vegetation.

> Warnings for crossings on Essex Street and School Street on the North Strand Trail would improve safety.

All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Saugus:





**Older Drivers** 









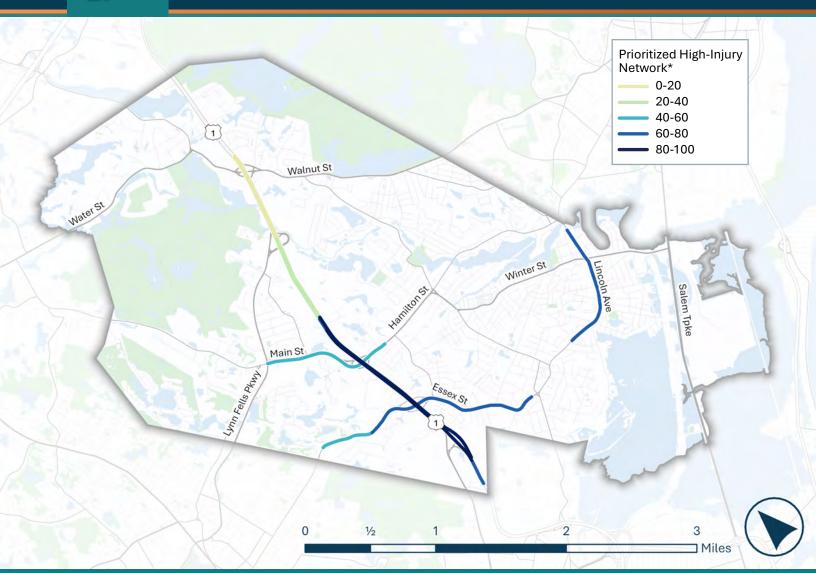
	Intersections	11	18%
	Lane Departure	18	30%
	Older Drivers	13	21%
Ŝ	Pedestrians	8	13%
100 mg/s	Bicyclists	1	2%
	Large Vehicles	7	11%
	Speeding	1	2%
	Younger Drivers	4	7%
	Motorcyclists	9	15%
	Distracted Driving	6	10%
	Impaired Driving	6	10%
	Occupant Protection	3	5%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **SAUGUS** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Broadway	Frank P Bennett Hwy	Walmart	State
Essex St	Broadway	Lincoln Ave	Local
Lincoln Ave	Sunnyside Park	Vincent St	Local
Essex St	Broadway	Stevens Pl	State
Main St	Lynn Fells Pkwy	Broadway	Local



#### **TURNING MOVEMENT-RELATED INTERSECTION CRASHES**



**55%** of intersection fatal and serious injury crashes in Saugus involved turning movement between 2018 and 2022.



33%

occurred at stop-controlled T-intersections



67%

involved a left-turning vehicle



33%

involved a collision with pedestrians

Note: Percentages only apply to turning movement-related intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Advance yield/stop markings	Signalized Intersections	Remove severe conflicts	Low	High
Centerline hardening	Signalized Intersections with a history of turn-related crashes or observed improper yield behaviors	Increase attentiveness and awareness	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium

#### **HEAD-ON CRASHES ON SEGMENTS**



Head-on crashes accounted for **28%** of Saugus's segment fatal and serious injury crashes.



43%

occurred on two-way divided roadways with unprotected medians



21%

happened on roadways with posted speed limits greater than 45 mph



29%

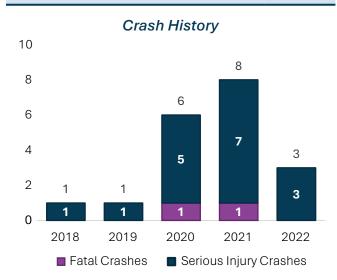
involved impaired driving

Note: Percentages only apply to head-on-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Center line rumble strips and stripes	Undivided roadway segments	Increase attentiveness and awareness	Low	High
SafetyEdge	All types of roadway segments	Remove severe conflicts	Low	High
Median barriers	Divided roadway segments	Remove severe conflicts	Medium	Medium



Population (2020)	4,402
Annual Vehicle Miles Traveled (2022)	38.0M
Total Crashes (2018-2022)	700
Fatal & Serious Injury Crashes (2018-2022)	19
Fatal & Serious Injury Crash Rate (per 100,000 residents)	431.6
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	0
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	1





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Sherborn:

**Older Drivers** 

Intersections

Lane Departure

The <b>TOP THREE MOST OVER REPRESENTED</b> EAs compared to the entire Commonwealth:		

-A3 compared to the entire commonweatth.				
Lane Departure	Impaired Driving	Speeding		

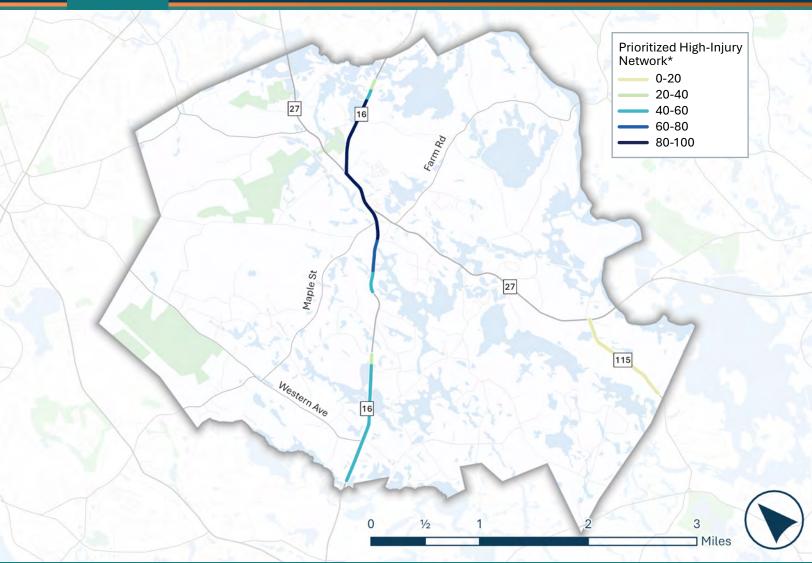
Interse	ections	5	26%
Lane [	Departure	11	58%
Older	Drivers	8	42%
Pedes	trians	1	5%
Bicycl	ists	0	0%
Large '	Vehicles	1	5%
Speed	ling	4	21%
Young	er Drivers	2	11%
Motor	cyclists	2	11%
Distra	cted Driving	1	5%
Impair	red Driving	5	26%
Occup	pant Protection	1	5%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **SHERBORN** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
N Main St	Eliot St	Maple St	Local
Eliot St	N Main St	Fieldstone Ln	Local
Washington St	Maple St	Russett Hill Rd	Local
Washington St	Cranberry Ln	Old Orchard Rd	Local
Bullard St	S Main St	Nimrod Rd	Local





#### **INTERSECTION CRASHES INVOLVING FAILURE TO YIELD**



**60%** of intersection fatal and serious injury crashes in Sherborn involved failure to yield right-of-way between 2018 and 2022.

67%

occurred at stop-controlled T-intersections



were angle crashes



involved an older driver (aged 65 and above)

Note: Percentages only apply to failure to yield intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Enhanced signing and delineation	Unsignalized intersections	Increase attentiveness and awareness	Low	High
Advanced intersection warning signs	Approach lanes of intersections	Increase attentiveness and awareness	Low	High
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Clear sight triangles	Unsignalized intersections with restricted sight distance	Increase attentiveness and awareness	Medium	High

# **LANE DEPARTURE CRASHES** ON SEGMENTS (RUN-OFF-ROAD)



Run-off-road lane departure crashes accounted for **50%** of Sherborn's segment fatal and serious injury crashes.



86%

occurred on two-way undivided roadways



86%

involved aggressive driving



43%

involved impaired driving

Note: Percentages only apply to lane departure (run-off-road)involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Shoulder and edge line rumble strips and stripes	All types of roadway segments	Increase attentiveness and awareness	Low	High
Enhanced curve delineation	Horizontal curves	Increase attentiveness and awareness	Low	High
SafetyEdge	All types of roadway segments	Remove severe conflicts	Low	High





Population (2020)	6,562
Annual Vehicle Miles Traveled (2022)	59.5M
Total Crashes (2018-2022)	388
Fatal & Serious Injury Crashes (2018-2022)	14
Fatal & Serious Injury Crash Rate (per 100,000 residents)	213.3
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	1
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	0

#### **Crash History** 5 4 4 4 3 2 2 1 2 2 0 2018 2019 2020 2021 2022 ■ Fatal Crashes Serious Injury Crashes



All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Topsfield:













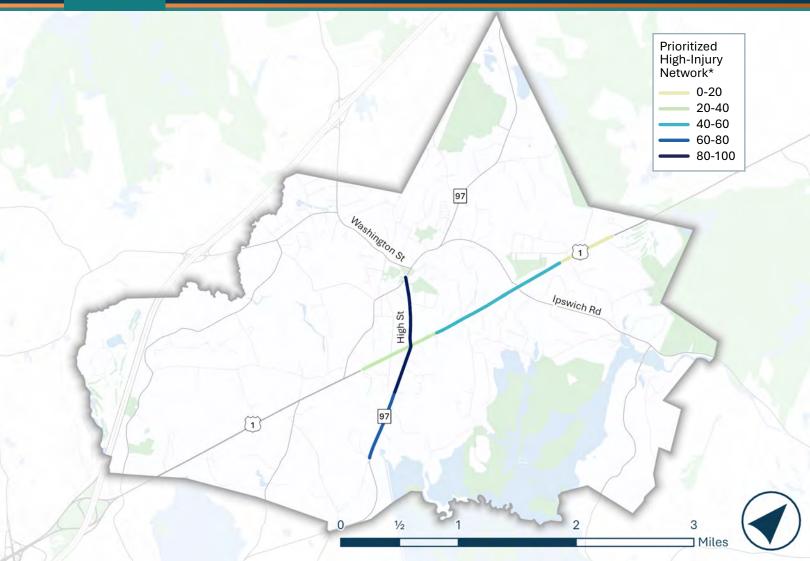
Intersections	5	36%
Lane Departure	3	21%
Older Drivers	3	21%
Pedestrians	0	0%
Bicyclists	1	7%
Large Vehicles	0	0%
Speeding	2	14%
Younger Drivers	2	14%
Motorcyclists	1	7%
Distracted Driving	0	0%
Impaired Driving	3	21%
Occupant Protection	3	21%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **TOPSFIELD** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
High St	Main St	Boston St	Local
High St	Boston St	Valley Rd	Local
Boston St	Ipswitch Rd	High St	State
Boston St	High St	Maple St	State
Boston St	Wildes Rd	Ipswitch Rd	State





#### **TOPSFIELD** CONTINUED

#### **REAR-END CRASHES AT INTERSECTIONS**



**40%** of intersection fatal and serious injury crashes in Topsfield were rear-end crashes between 2018 and 2022.



100%

occurred at unsignalized T-intersections



**50%** 

happened in a work zone



50%

involved an older driver (aged 65 and above)

Note: Percentages only apply to rear-end intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Advanced intersection warning signs	Approach lanes of intersections	Increase attentiveness and awareness	Low	High
Clear sight triangles	Unsignalized intersections with restricted sight distance	Increase attentiveness and awareness	Medium	High
Transverse rumble strips	Approach lanes of unsignalized intersections	Reduce vehicle speeds; Increase attentiveness and awareness	Medium	High

#### SIDESWIPE CRASHES ON SEGMENTS



Sideswipe crashes accounted for **33%** of Topsfield's segment fatal and serious injury crashes.



67%

occurred on two-way undivided roadways



67%

were sideswipe crashes in the opposite direction



33%

involved speeding

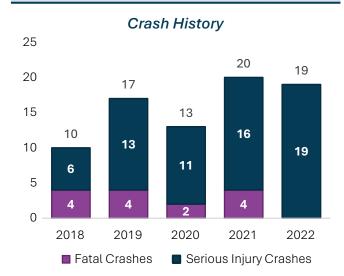
Note: Percentages only apply to sideswipe-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Pavement marking improvement	All types of roadway segments	Increase attentiveness and awareness	Low	High
Medians	Urban and suburban multilane roadway segments	Remove severe conflicts; reduce vehicle speeds	Low	High
Speed Humps	Low-speed local and collector streets	Reduce vehicle speeds	Low	High





Population (2020)	57,442
Annual Vehicle Miles Traveled (2022)	443.4M
Total Crashes (2018-2022)	4,685
Fatal & Serious Injury Crashes (2018-2022)	79
Fatal & Serious Injury Crash Rate (per 100,000 residents)	137.5
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	4
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	14





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the <u>US Census Bureau</u>. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Weymouth:













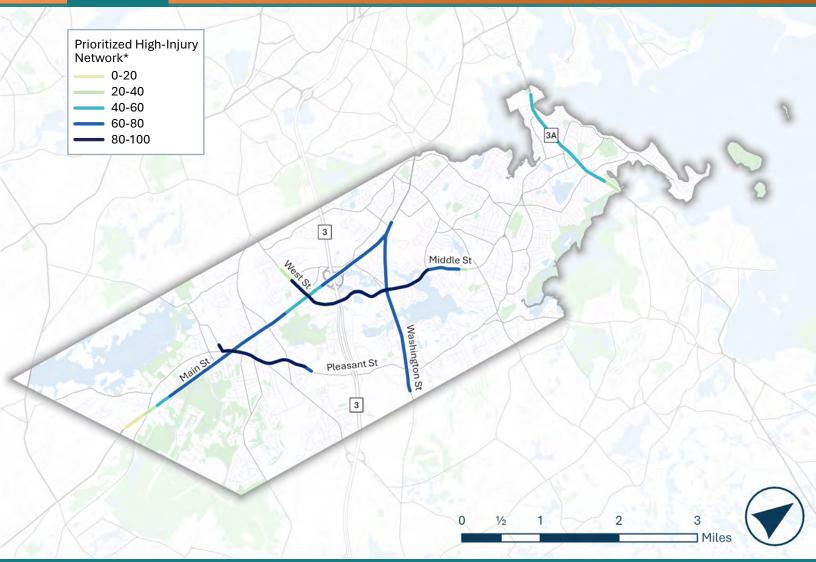
	Intersections	27	34%
	Lane Departure	17	22%
	Older Drivers	21	27%
ŝ	Pedestrians	14	18%
5	Bicyclists	4	5%
	Large Vehicles	3	4%
	Speeding	2	3%
(N)	Younger Drivers	8	10%
	Motorcyclists	10	13%
	Distracted Driving	5	6%
	Impaired Driving	8	10%
	Occupant Protection	1	1%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **WEYMOUTH** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Middle St	Main St	Washington St	Local
Pleasant St	Main St	Park Ave	Local
Middle St	Washington St	Essex St	Local
Washington St	Stillman St	White Oaks Ln	State
Washington St	Middle St	Federal St	State



#### **HEAD-ON CRASHES AT INTERSECTIONS**



**30%** of intersection fatal and serious injury crashes in Weymouth were head-on crashes between 2018 and 2022.



38%

occurred on two-way undivided roadways



38%

happened in dark conditions



25%

involved a left-turning vehicle

Note: Percentages only apply to head-on intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Protected left turn phasing	Signalized intersections with relatively high left turn volumes	Remove severe conflicts	Low	High
Offset left-turn lanes at intersections	Intersections with a high frequency of crashes between vehicles turning left and opposing through vehicles	Remove severe conflicts	Medium	Medium
Roundabouts	Intersections in both rural and urban areas	Remove severe conflicts; reduce vehicle speeds	High	Low

#### SEGMENT CRASHES INVOLVING VEHICLE **ENTERING/LEAVING TRAFFIC LANES**



Crashes involving vehicle entering or leaving traffic lanes accounted for 12% of Weymouth's segment fatal and serious injury crashes.



100%

occurred on two-way undivided roadways



were head-on

33%

involved driver failure to yield right-of-way

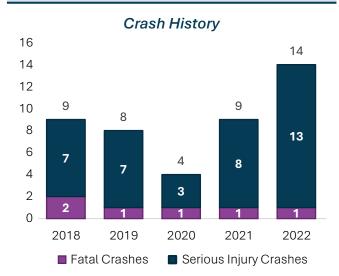
Note: Percentages only apply to vehicle entering/leaving traffic lanes-involved segment fatal and serious injury crashes.

crashes

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Medians	Urban and suburban multilane roadway segments	Remove severe conflicts; Reduce vehicle speeds	Low	High
Limit allowable movements at driveways (Corridor Access Management)	All types of roadway segments	Remove severe conflicts	Low	High
Reduce density through driveway closure, consolidation, or relocation (Corridor Access Management)	All types of roadway segments	Remove severe conflicts	High	Low



Population (2020)	12,174
Annual Vehicle Miles Traveled (2022)	125.8M
Total Crashes (2018-2022)	1,148
Fatal & Serious Injury Crashes (2018-2022)	44
Fatal & Serious Injury Crash Rate (per 100,000 residents)	361.4
Bicyclist Fatal & Serious Injury Crashes (2018-2022)	0
Pedestrian Fatal & Serious Injury Crashes (2018-2022)	1





All crash data comes from the MassDOT IMPACT Portal. Population data comes from the US Census Bureau. Vehiclemiles-traveled data comes from Massachusetts Vehicle Census.

# The **TOP THREE MOST COMMON** emphasis areas (EAs) in Wrentham:













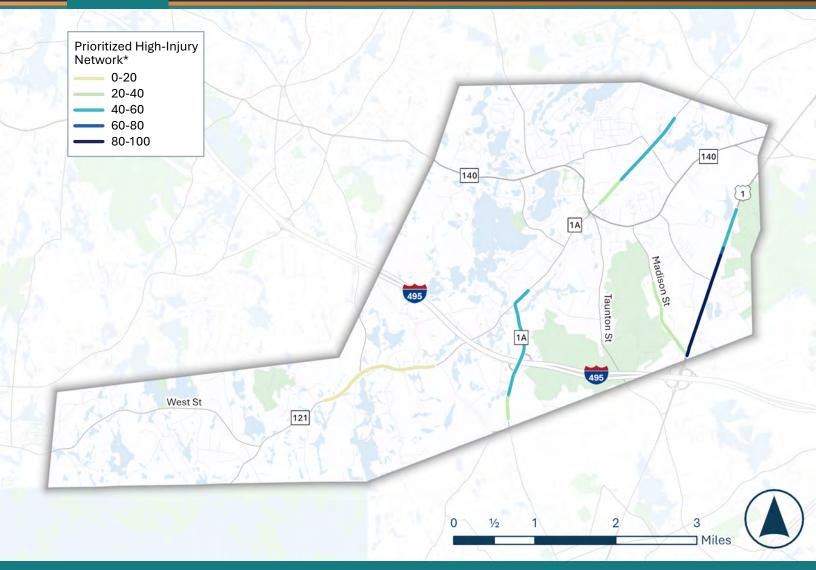
	Intersections	22	50%
	Lane Departure	8	18%
	Older Drivers	9	20%
Ŝ	Pedestrians	1	2%
100 mg/s	Bicyclists	0	0%
	Large Vehicles	4	9%
	Speeding	2	5%
	Younger Drivers	8	18%
	Motorcyclists	11	25%
	Distracted Driving	2	5%
	Impaired Driving	0	0%
	Occupant Protection	7	16%

- # of Fatal & Serious Injury Crashes
- % of Municipality's Fatal & Serious Injury Crashes





#### **WRENTHAM** CONTINUED



\* The Municipality High-Injury Networks were developed by identifying the top 5% of roadway segments by crash frequency with extra weight given to fatal/serious injury crashes and crashes involving vulnerable road users. The network was prioritized and scored from 0 to 100 using crash history, demographics, exposure to crashes, and proximity to key destinations. Refer to the full Vision Zero Action Plan for more information on priority scoring.

Top 5 Corridors	From	То	Ownership
Washington St	Madison St	Thurston St	State
South St	Outlet Blvd	West St	State
Washington St	Thurston St	Myrtle St	State
Dedham St	Weber Farm Rd	Franklin St	State
Madison St	Washington St	Regent Rd	Local





#### **INTERSECTION CRASHES INVOLVING FAILURE TO YIELD**



**50%** of intersection fatal and serious injury crashes in Wrentham involved failure to yield right-of-way between 2018 and 2022.

55%

occurred at unsignalized T-intersections 36%

were head-on crashes

73%

involved a left-turning vehicle

Note: Percentages only apply to failure to yield intersection fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Enhanced signing and delineation	Unsignalized intersections	Increase attentiveness and awareness	Low	High
Advanced intersection warning signs	Approach lanes of intersections	Increase attentiveness and awareness	Low	High
Backplates with retroreflective borders	Signalized intersections	Increase attentiveness and awareness	Low	High
Dedicated left-turn lanes with protected left-turn signal phasing at intersections	Intersections with a history of turn-related crashes	Remove severe conflicts	Medium	Medium

#### LARGE VEHICLE-INVOLVED **SEGMENT CRASHES**



Crashes involving large vehicles accounted for **14%** of Wrentham's segment fatal and serious injury crashes.



100%

occurred on two-way undivided roadways

33%

involved collisions with bridge overhead structure

33%

involved distracted driving

Note: Percentages only apply to large vehicle-involved segment fatal and serious injury crashes.

Countermeasures	Applications	Safe System Roadway Design Hierarchy	Cost	High-Risk Potential
Center line rumble strips and stripes	Undivided roadway segments	Increase attentiveness and awareness	Low	High
Truck lane restrictions	Multilane freeway segments	Remove severe conflicts	Low	High



