Moving Together 23

Speed Management

Neil Boudreau

MassDOT Traffic and Safety

massDOT
Massachusetts Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

Massachusetts Roadmap for Road Safety

Strategic Highway Safety Plan

1. Implement Speed Management

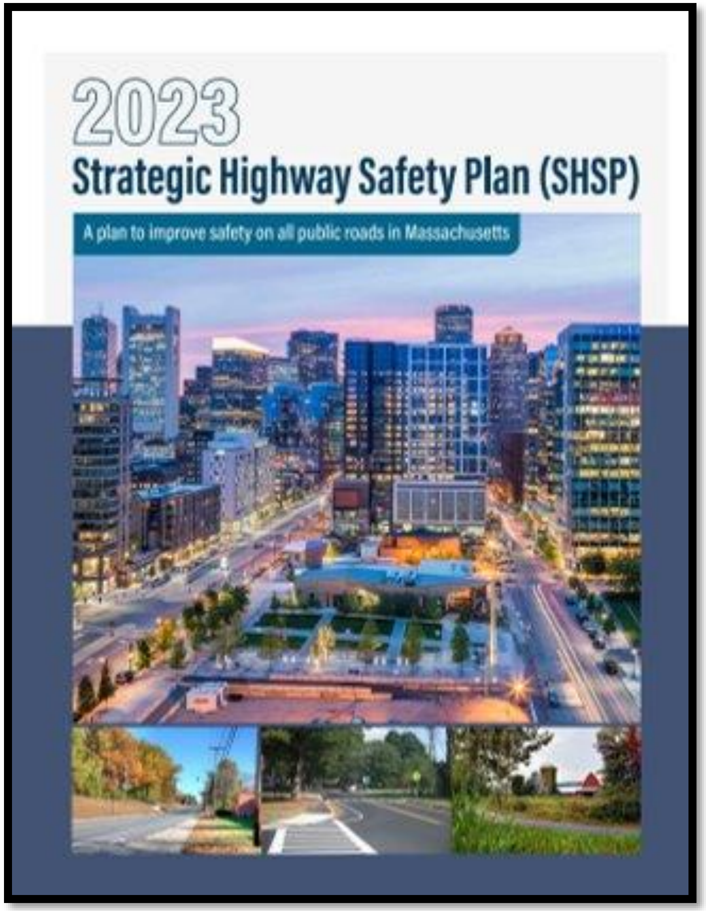
2. Address to–risk locations and populations

3. Take an active role in affecting change in vehicle design, features, and use

4. Accelerate research and adoption of technology

5. Double down on what works

6. Implement new approaches to public education and awareness



Implement Speed Management

2018 SHSP sub-initiatives for speeding:

- Enhance enforcement efforts to curb speeding and aggressive driving
- Improve the process of setting roadway speed limits by including travel speed and roadway context.
- Continue the process of educating the public on the risks associated with speeding and aggressive driving behavior.

2023 SHSP sub-initiatives for speeding

- 1.1 Evaluate and adjust operating speeds through roadway designs that are self-enforcing
- 1.2 Develop and execute a procedure for target speed setting in all project types (e.g., roadway reconstruction, bridge, preservation, development, new roadways)
- 1.3 Amend Massachusetts regulations related to speed (expand the definition of a school zone, adjust speed limit setting, modify statutory speeds)

Initiatives Underway – Speed Management

- Developed external **Safe Speed website** (www.mass.gov/safe-speeds) to assist municipalities
- Provide **community funding** through the Shared Streets and Spaces Grant to address speed for locally owned roads
- **Amend Massachusetts regulations** related to speed (expand the definition of a school zone, adjust speed limit setting)
- Active Statewide Planning and **Research (SPR) project** that evaluates the impacts of speed management treatments related to emergency personnel and snow & ice operations, with ultimate goal to provide solutions.
- Developing a **process to prioritize roadways with excessive speeding** by comparing travel speed with speed limits.
- Developing a **procedure for target speed setting** for inclusion in Project Development and Design Guide (PDDG) Chapter 3 to be released this winter.
- **Materials procurement for municipalities**

Procedure for target speed setting

- **Why important?** A target speed is a selected speed use to identify the highest operating speed at which vehicles should travel on a roadway in a specific context to ensure safety of all roadway users..

- **New guidance in development includes:**
  - Relationship between target speed and design speed
  - Process for identifying target and design speed
  - Guidance on how to establish a target speed and how to achieve it through roadway treatments
  - Identifying the need for separation between modes
  - The role of speed limits and speed zoning in speed management, primarily post construction

- **Incorporating process into MassDOT project development process to institutionalize safe speed approach**

Updated process and guidance coming soon…

- **Sample guidance in development**
  - Removing reliance, and actively discouraging, selecting design speed based solely on existing posted speed limit
  - Reconnect speed with area type (land use context)
  - New process flowchart with integration into project initiation, scoping, and design reviews
  - Updated Design Justification Workbook.
  - New guidance for identifying a target speed based on activity level and conflict density.

Roadway Treatment Resources

- **Safe Speed website** (www.mass.gov/safe-speeds) – includes information about roadway treatments

- **Federal Highway Administration Speed Management** website http://highways.dot.gov/safety/speed-management





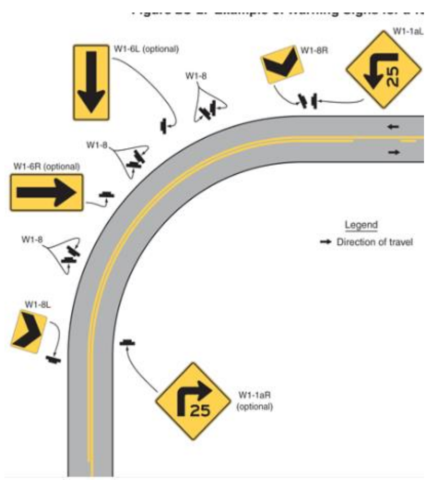




Materials procurement for Municipalities

- Focusing on Rural Run Off Roadway Departure (FoRRRwD) crashes – **provided speed feedback boards and signage** for high risk rural locally owned roadways in Districts 1 and 2 and expanding to District 3 and beyond.
- **School zone assemblies provided** to 130 communities (281 assemblies). All communities were offered.
- **Signage for new 4-foot safe passage** signs offered to all communities. 119 communities opted in (3,144 signs) and 1,187 to MassDOT Districts (Acts of 2022 Chapter 358 – An Act to Reduce Fatalities)

Over 40% of pedestrian and bicyclist fatalities and serious injuries within 2,000 feet of a school



Calling DPWs and first responders to fill out survey

- Active Statewide Planning and **Research (SPR) project** that evaluates the impacts of speed management treatments related to **emergency personnel** and **snow & ice operations**, with ultimate goal to provide solutions.

Fill out survey conducted by UMass Amherst here:

https://umassamherst.co1.qualtrics.com/jfe/form/SV_b7bIoxQixwyGB6K

The Direct Vision Project

Kris Carter

Chief Possibility Officer, MassDOT

massDOT
Massachusetts Department of Transportation

U.S. Department of Transportation
Federal Highway Administration


made with
flixier

What is Direct Vision?

Direct vision is the ability of a driver to see firsthand outside their vehicle without the aid of an indirect vision device, such as mirrors or camera displays.

1. Reduces cognitive delay
2. Places drivers closer to others
3. No distorted images
4. No poorly adjusted mirrors

Courtesy of USDOT Volpe Center

a <u>zone</u> – not a spot

Why this Matters

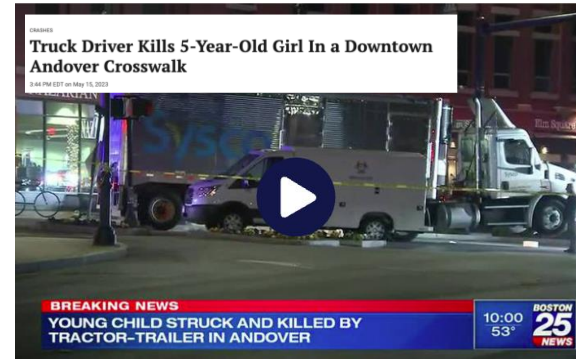
Cyclist Killed in Crash in Boston Involving Tractor-Trailer

The crash occurred at the intersection of Massachusetts and Harrison avenues, near the Boston Medical Center

By Melissa Buja • Published April 22, 2020 • Updated on April 22, 2020 at 5:25 pm

Bicyclist killed by truck is remembered as skilled surgeon, scientist

By Laura Crimaldi Globe Staff, August 8, 2015, 10:02 p.m.



Tractor-Trailer Fatally Strikes Bicyclist in Harvard Square

Bicyclist fatally struck by UPS truck in Newton, authorities say

Share

WCVB 5

Updated: 11:58 PM EDT Aug 28, 2023

Infinite Scroll Enabled

Russ Reed

Cyclist Killed in Crash in Boston Involving Tractor-Trailer

The crash occurred at the intersection of Massachusetts and Harrison avenues, near the Boston Medical Center

By Melissa Buja • Published April 22, 2020 • Updated on April 22, 2020 at 5:25 pm

Trending Stories

BICYCLING

Truck Driver Kills Cambridge Man Next to Symphony Hall in Boston

11:37 AM EDT on July 14, 2022

Cyclist Struck And Killed By Dump Truck Outside Museum Of Science

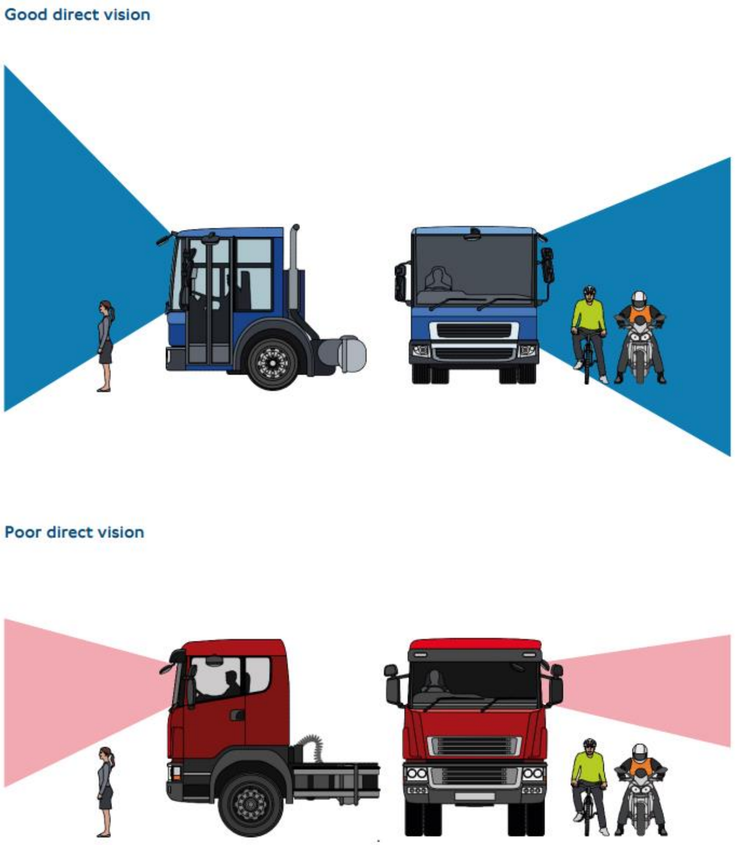
Updated November 09, 2018 | By WBUR Newsroom

Jury clears armored truck driver in 2005 death of cyclist Margaret 'Meg' Sanders in Northampton

By BOB DUNNStaff Writer

Last modified: Friday, April 26, 2013

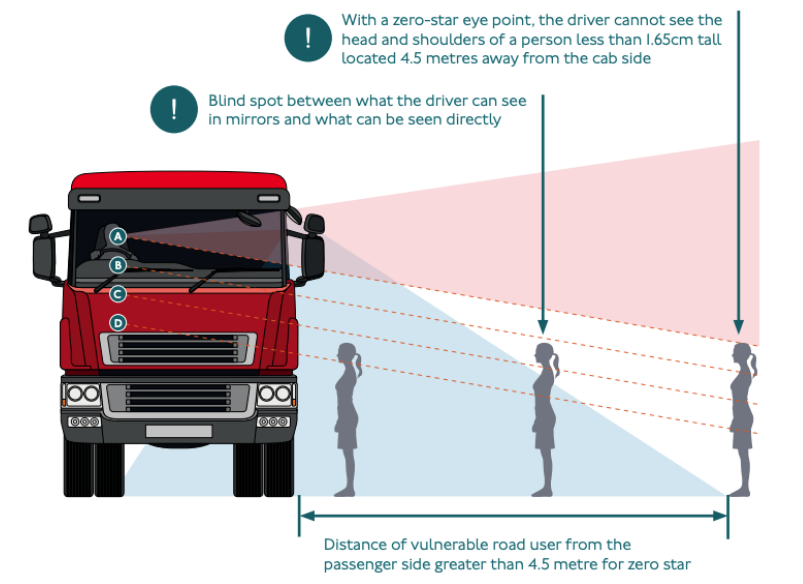
Drivers can’t avoid what they can’t see



Courtesy of Transport for London

One if by truck: London’s Direct Vision Standard

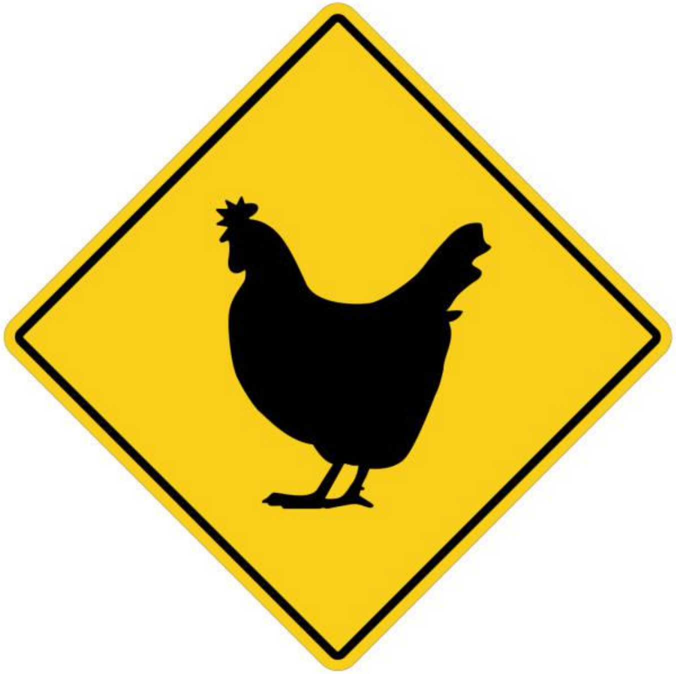
- Launched in 2021 by **Transport for London** and the Mayor of London as part of their Vision Zero program
- Since 2021, Heavy Goods Vehicles (HGV) with a zero-star Direct Vision Standard rating must be fitted with a Safe System (e.g. cameras, sensors, and mirrors) to operate in central London.
- Data suggests that fatal collisions where poor vision is a contributing factor **have fallen by 75%** since the introduction of the Direct Vision Standard.
- All vehicles must obtain an HGV permit. without a HGV permit, entering into Greater London is a £550 fine.



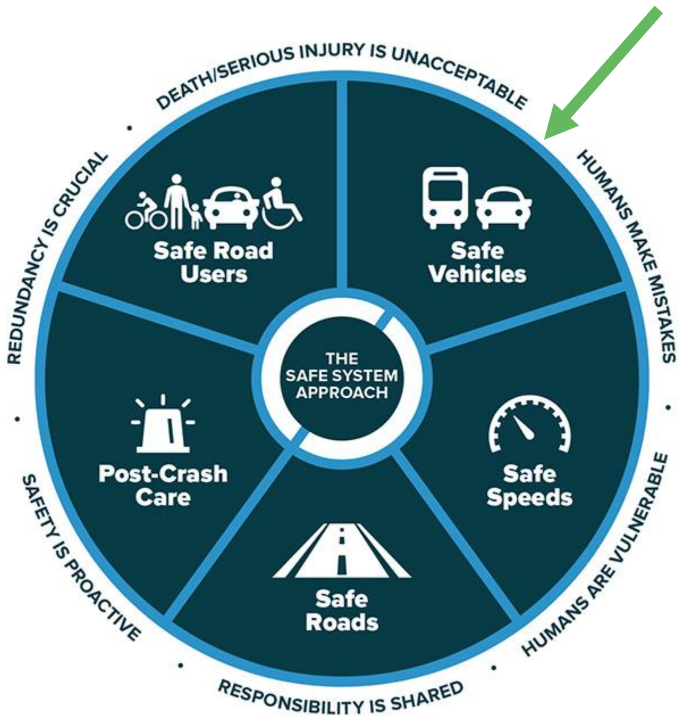
Sight line	Description
A	Zero-star eye point
B	One-star eye point
C	Three-star eye point
D	Five-star eye point

Source: Transport for London: content.tfl.gov.uk/tfl-dvs-guidance-for-operators-2023-acc.pdf

Why would a State DOT talk about Vehicle Design?



A **Safe System Approach** addresses the vehicles



Source: FHWA.

The Act to Reduce Traffic Fatalities

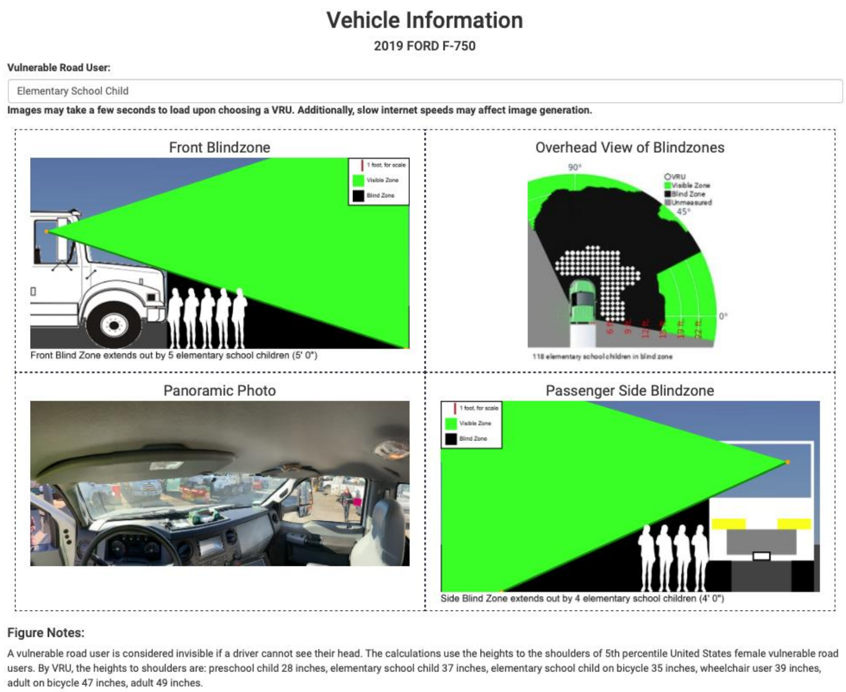
- Expands the definition of a vulnerable road user (VRU)
- **Requires sideguards** (aka lateral protective devices), cross-over mirrors, convex mirrors, and back-up cameras on state-owned and –contracted vehicles
- 4-ft passing requirement
- Speed management process
- Crash reporting standardization for crashes involving a vulnerable road user
- Rear red light requirement for bicycles (though not as primary reason for stopping a cyclist failing to comply)

- ...*and way down at the bottom*, Section 15 requires us to measure a sample of the MassDOT fleet (and of our contractors) for **direct vision**

Measuring and cataloging vehicles

Volpe Center VIEW App

- Vehicles are measured and entered in the VIEW database, a **crowd-sourced database** that documents the blind zones of different cars and trucks
- Catalogs year, make, model and a set of images
- Open-sourced application developed with Volpe by Olin College

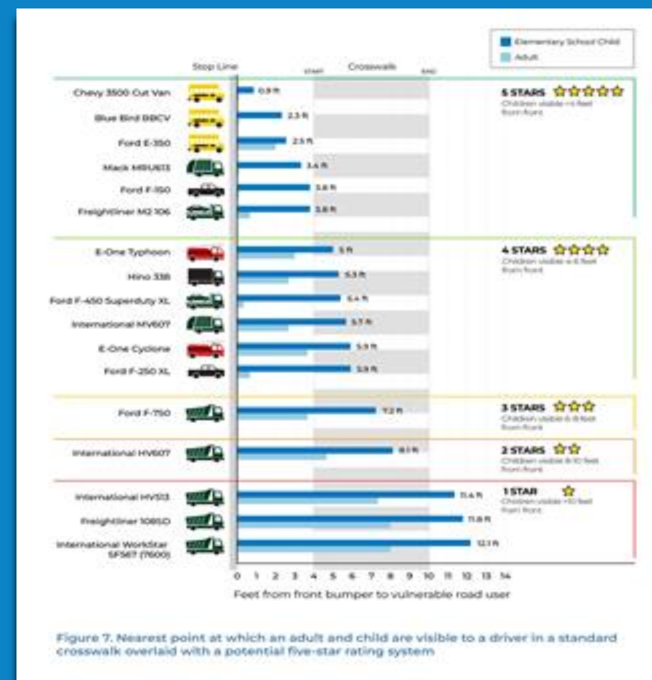


https://blindzonecalculator.herokuapp.com/

City of Boston Direct Vision efforts

- Measured the City of Boston fleet for Direct Vision
- Conducted a market analysis for high-vision cabs
- Prototyped a rating system based upon a 6ft driver for both front and side visibility
- Began coalition-building on Direct Vision with industry groups

Boston Fleet Measurement – Spring 2023

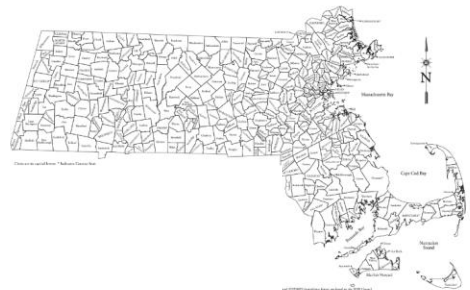


Courtesy of Boston Public Health Commission

MassDOT Direct Vision Study Scope

28-34
MassDOT vehicles

We will measure MassDOT-owned and –contracted vehicles with a standardized "measurement rig" for heavy and mid-duty trucks. Additionally, we will work with Volpe to train partners to conduct measurements



Up to
10 municipalities

Though not required by the legislation, we will include up to 10 municipalities in our measurement efforts through a training model, to ensure that knowledge of Direct Vision is shared across the Commonwealth

★★★★★

MassDOT
Direct Vision
rating system

The study will create a rating system to provide a prototype 'scorecard' for the MassDOT fleet and participating municipal fleets, while coordinating with industry partners to align on the standard, and understand potential countermeasures for low-scoring vehicles

What we hope to accomplish with the MassDOT study

- ”...produce evidence-based safety **recommendations stipulating a minimum acceptable level of direct vision** to be met by future applicable vehicles purchased and leased by the commonwealth” (*per Legislature*)

And...

- Identify potential safety countermeasures for vehicles with low scores

- Uncover additional questions worthy of further research and related implementation

- Build awareness of Direct Vision among stakeholders and lead a national coalition of other states and industry partners to continue the conversation

Our Invitation to you…

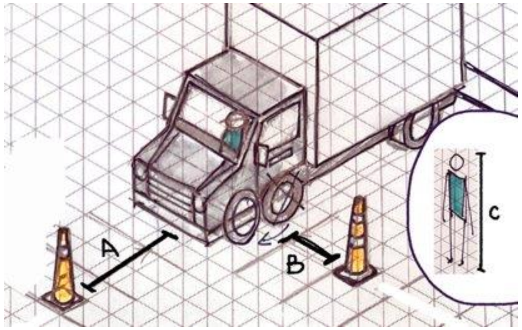
massDOT
Massachusetts Department of Transportation

with

U.S. Department of Transportation
Volpe Center

+

You and your Municipal Fleet



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Vulnerable Road User Safety Assessment

Kirsten Johnson

MassDOT Traffic Safety

massDOT
Massachusetts Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

VRU Assessment Guidelines

Initial VRU Assessment due November 15, 2023 as addendum to SHSP

- Data driven
- Update every 5 years

Consultation to organizations that represent high-risk areas

- MPOs, local gov't, RTAs, advocates
- Review STIP

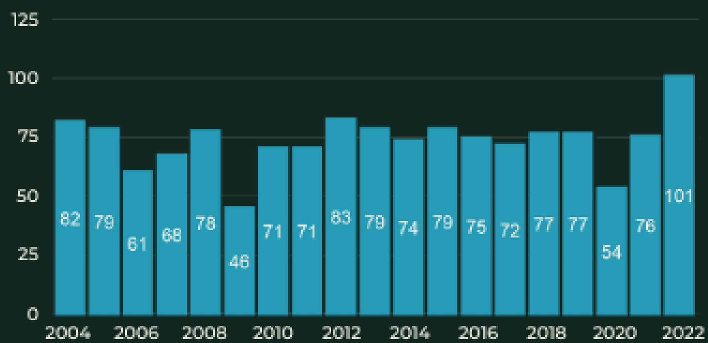
Program of Projects or Strategies

- Safe System
- FHWA proven countermeasures
- Specific location projects
- Policy/plans for high-risk regions
- Utilize consultation input

MA Non-Motorist Crash Trends

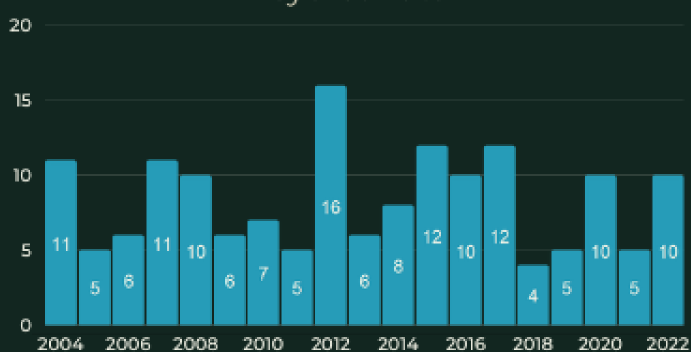
2004-2022, IMPACT

Pedestrian Fatal

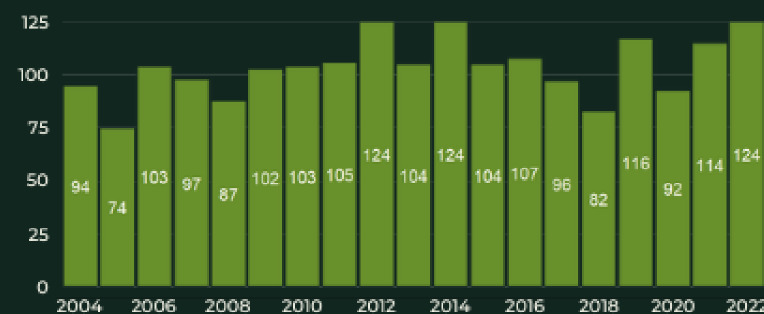


Pedestrian Serious Injury

Bicyclist Fatal



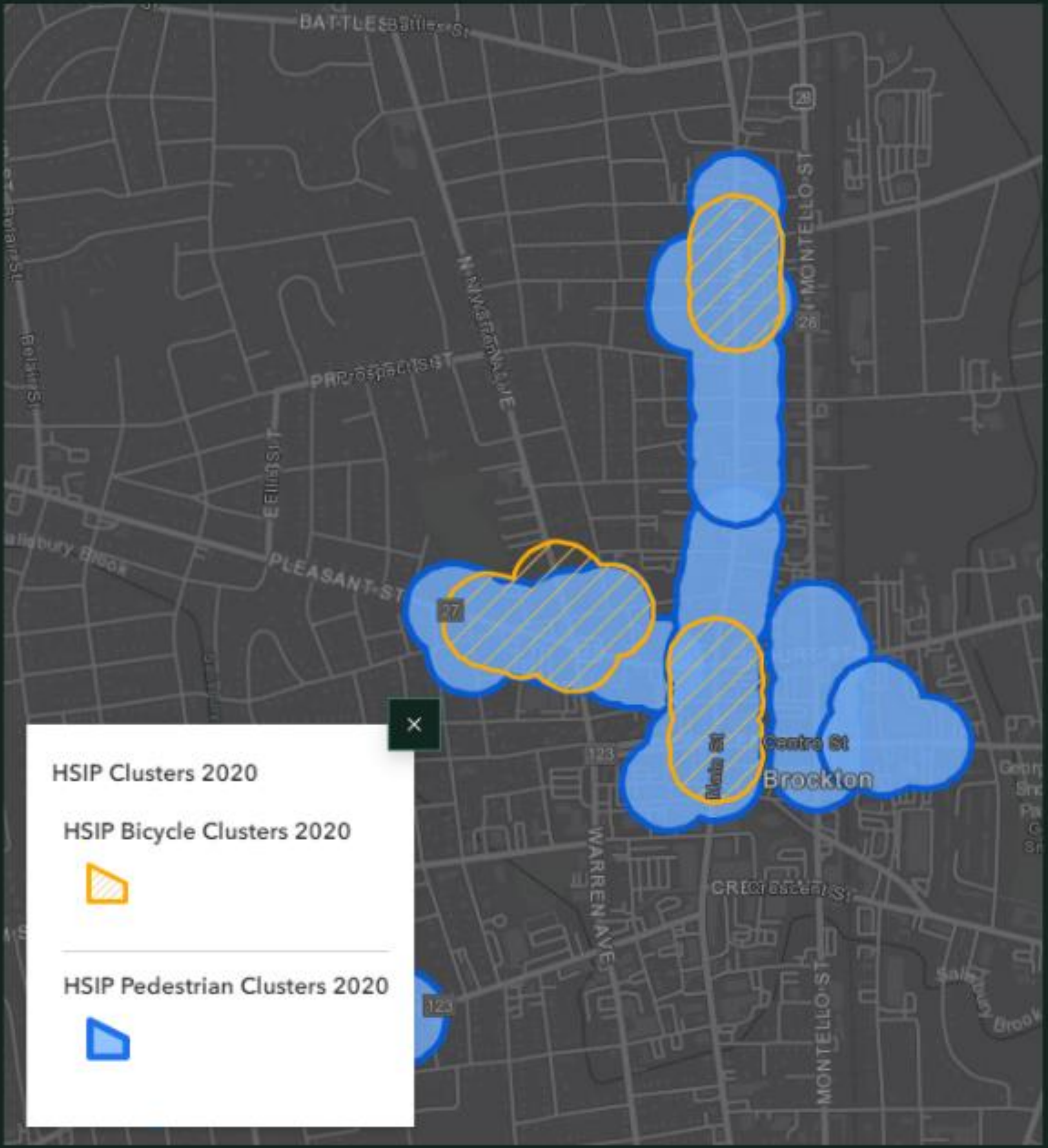
Bicyclist Serious Injury



Crash Hotspots

Bicycle and Pedestrian HSIP Clusters

- Top bicycle and pedestrian crash hotspots
- Used crash severity weighting, with more weight given to fatal and serious injury crashes (21:1)



Systemic Data

Bicycle and Pedestrian Risk Segments and Intersections

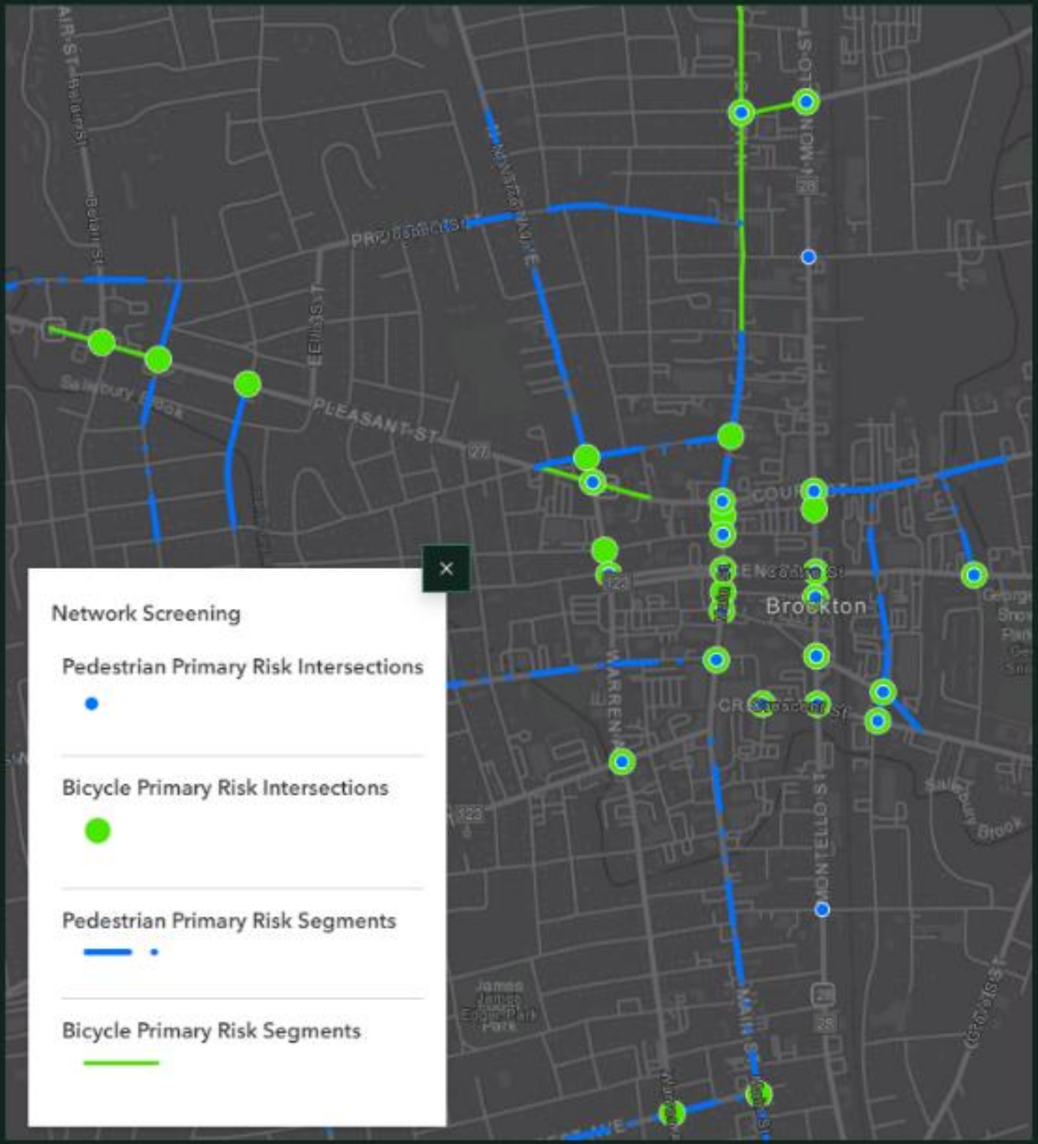
Risk models used to rank road segments and intersections take into roadway attributes as well as community-based risk factors.

Roadway attributes include:

- Functional class
- Traffic volumes
- Median presence
- Number of lanes
- Intersection type
- Intersection control type

Community-based risk factors include:

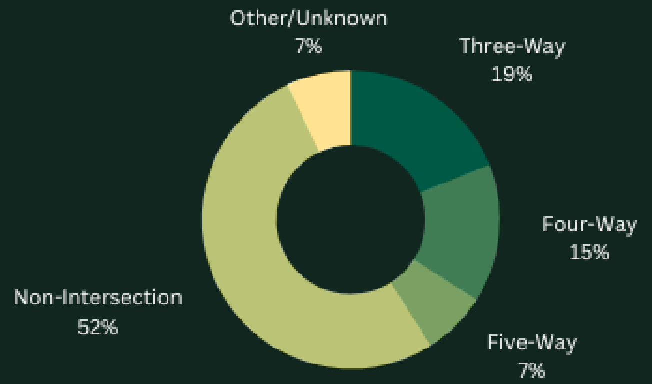
- Employment density
- Population density
- Zero vehicle households
- Proportion of employment in food service, retail, and accommodation
- Proportion population living in poverty
- Median household income
- Environmental justice communities
- Transit stops



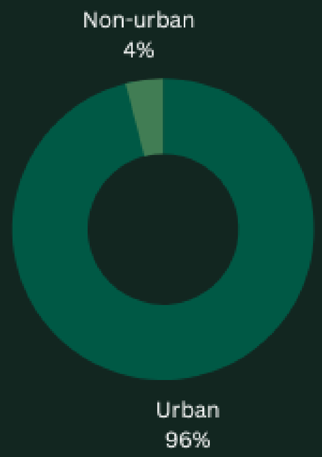
Pedestrian KA Crash Tree Statistics

2016-2020

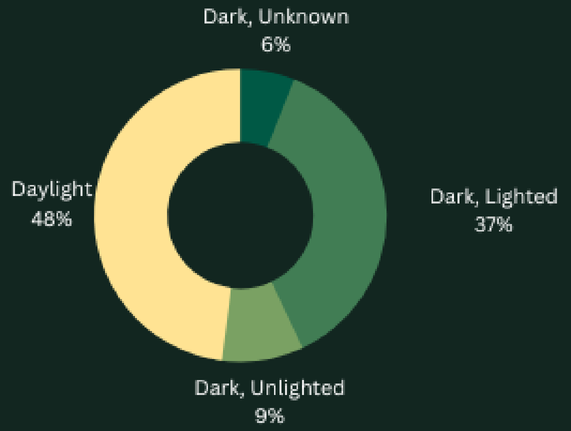
Intersection Type



Urban Type



Lighting Conditions



Pedestrian KA Crash Characteristics

2016-2020

Intersection - 41%

56% contained a pedestrian in a marked crosswalk

53% occurred during daylight hours

70% occurred at locally-owned intersections

83% had curbs on both sides of the road

62% occurred when the vehicle was traveling straight ahead

41% at signal-controlled intersections

28% occurred when the vehicle was turning left

Non-Intersection - 52%

81% occurred when the vehicle was traveling straight ahead

65% had curbs on both sides of the road

62% contained a pedestrian in the roadway

93% occured on 2-lane roadways

83% occurred on locally-owned roads

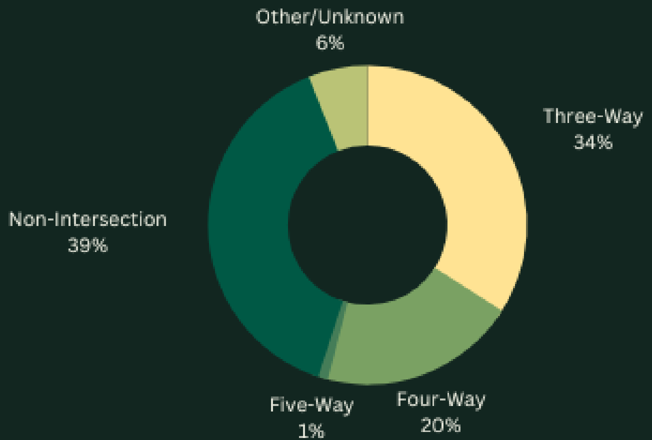
54% occurred during dark hours

7% occurred on Interstate roads

Bicyclist KA Crash Tree Statistics

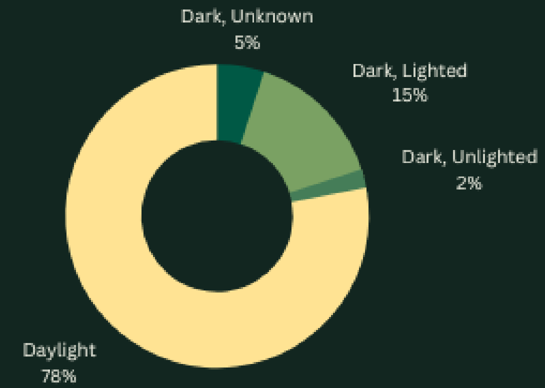
2016-2020

Intersection Type



Urban Type

Lighting Conditions



Bicyclist KA Crash Characteristics

2016-2020

Intersection- 55%

54% contained a cyclist in the roadway/shoulder

76% occurred during daylight hours

80% occurred at locally-owned intersections

64% had curbs on both sides of the road

55% occurred when the vehicle was traveling straight ahead

31% at signal-controlled intersections*

31% occurred when the vehicle was turning left

Non-Intersection - 39%

66% occurred when the vehicle was traveling straight ahead

54% had curbs on both sides of the road

80% contained a cyclist in the roadway

90% occured on 2-lane roadways

74% occurred on locally-owned roads

77% occurred during daylight hours

Transit Proximity to VRU KA Crashes

Within 300 ft of Bus Stops Statewide:

- 34% of KA Bicyclist Crashes
- 41% KA Pedestrian/Skater Crashes
- 6% Centerline Miles

Within 300 ft of MBTA Bus Stops:

- 45% of KA Bicyclist Crashes
- 50% KA Pedestrian/Skater Crashes
- 16% Centerline Miles

VRU Bus Stops Coordination

As a response to the disproportionate number of VRU crashes near bus stops:

- MassDOT is pursuing improvements at stops that overlap with pedestrian risk layers.
- Bus stops near existing project locations being reviewed to incorporate safety countermeasures
- A systemic project is being initiated in collaboration with RTAs focusing on crosswalk safety at more than 160 locations statewide.

CommonWealth

NONPROFIT JOURNAL OF POLITICS, IDEAS & CIVIC LIFE

DONATE

Passengers boarding the 111 bus at Haymarket.

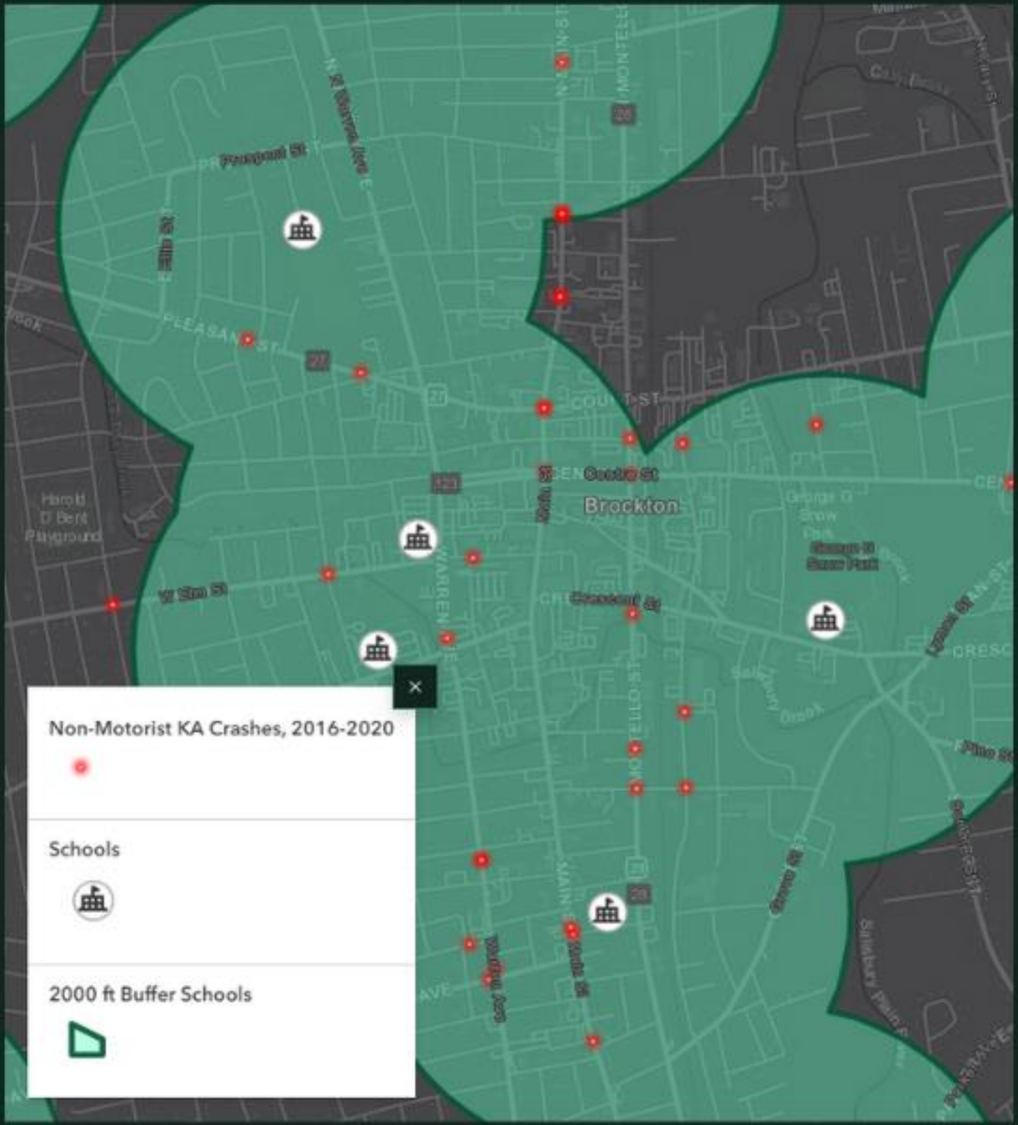
TRACKING TRANSPORTATION / TRANSPORTATION

Bus stops targeted to improve pedestrian safety

School Proximity to VRU KA Crashes

Within 2000 ft of Schools Statewide:

- 41% KA Bicyclist Crashes
- 44% KA Ped/Skater Crashes
- 21% Centerline Miles



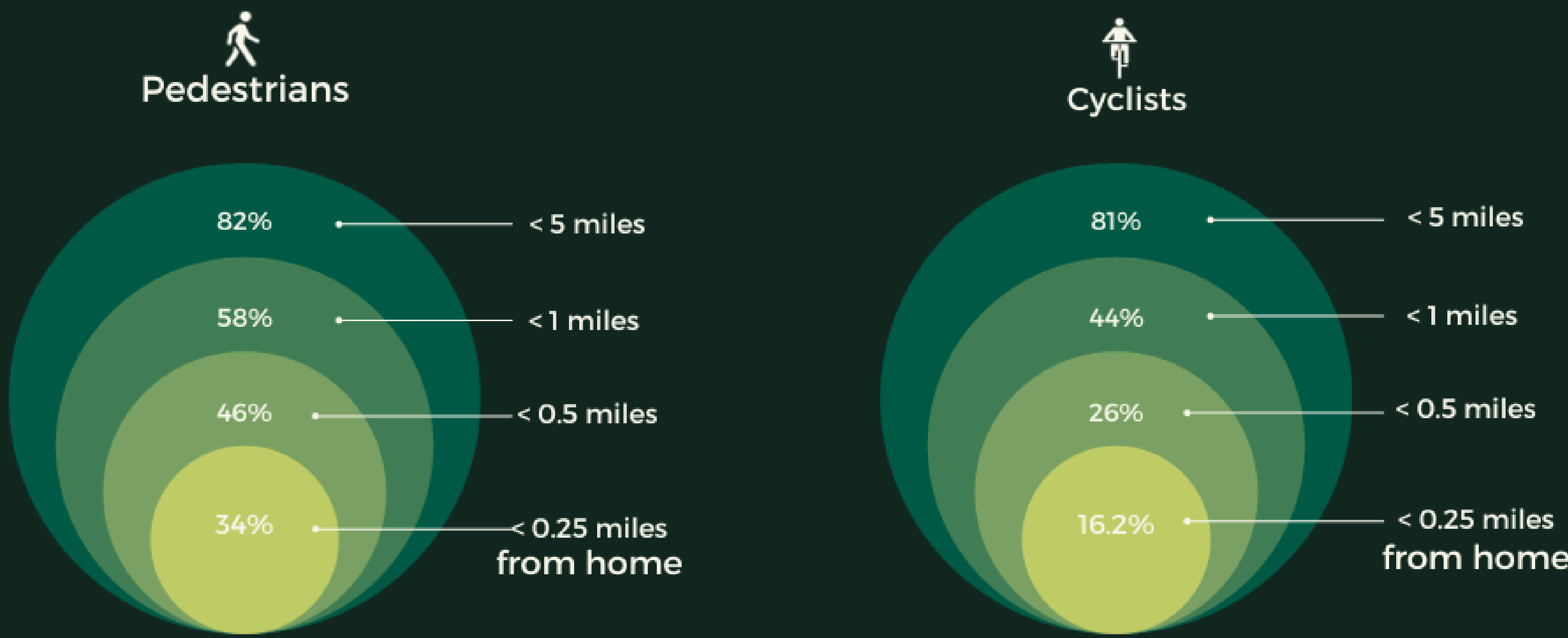
School Zone Speed Limit Sign Assemblies Grant

- A material grant opportunity was created to award municipalities with School Zone Speed Limit Sign Assemblies

- MassDOT notified municipalities of this materials grant funding opportunity, through the Safe Routes to School program and HSIP, in December 2022.

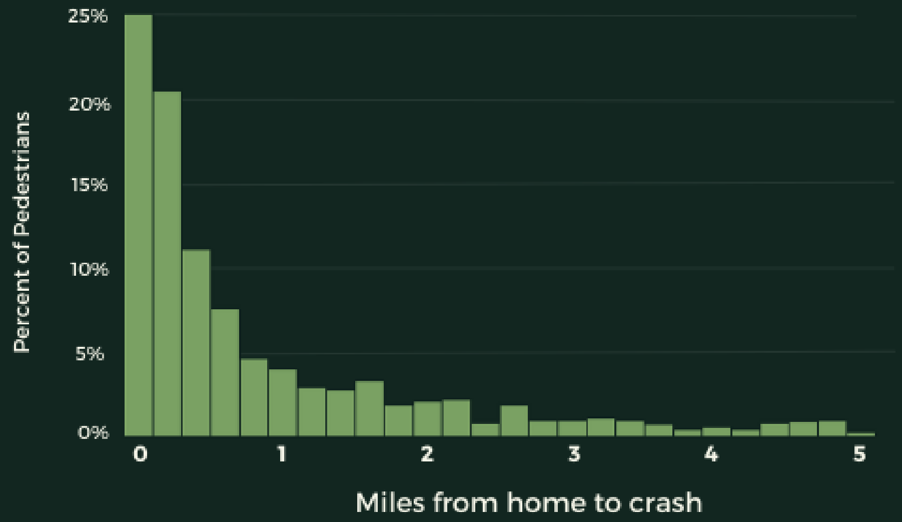
- 130 Municipalities participating
  - 137 Schools and 281 Assembly Units ordered
  - 210 Assemblies delivered
  - 63 assemblies installed for 31 school zones, in 30 municipalities
  - 50 New School Zones established

Distance from KA Crash Location to Non-Motorist Home

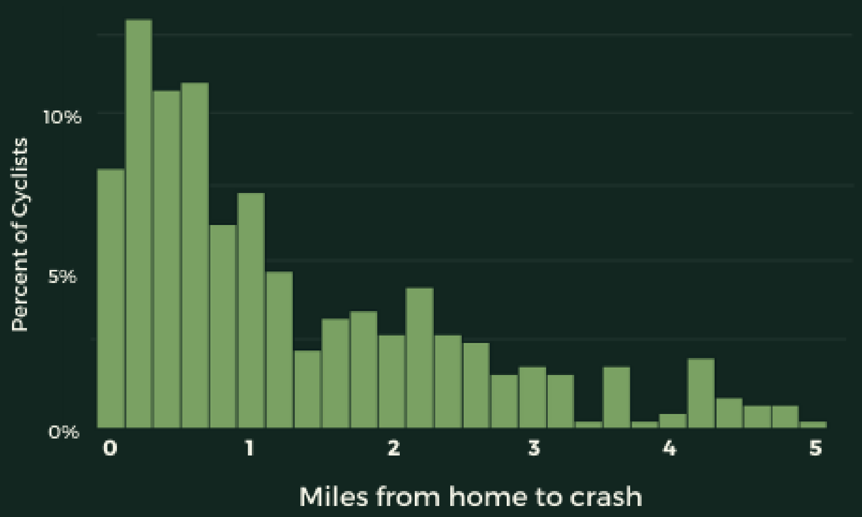


Distance from KA Crash Location to Non-Motorist Home

Pedestrians Involved in KA Collisions within 5 Miles from Home Address



Cyclists Involved in KA Collisions within 5 Miles from Home Address



Alcohol and Drug Use in Persons Hospitalized for Non-fatal Motor Vehicle Crash Injuries

2017-2022*

	Alcohol and/or Drug Use	Alcohol Use	Drug Use	Cannabis Use	Opioid Use**
Pedestrians	25%	15%	15%	6% [3]	8%
Cyclists	16%	9% [1]	12% [2]	No Data	No Data

*Reported federal fiscal year (FFY): Oct. 1 - Sep. 30 MA residents
**excluded chronic use for pain

[1] 2019 and 2021 data omitted due to confidentiality
[2] 2018 and 2019 data omitted due to confidentiality
[3] 2017 data omitted due to confidentiality

VRU Motor Vehicle Traffic-related Deaths and Injury-related Hospital Stays

from 2017-2022

Pedestrians
age 55+
on average had a death rate 2 times greater than younger age groups

100% of all
Asian
pedestrians and cyclists who died were foreign-born

from 2016-2021*

Black
pedestrians had rates of injury-related hospital stays 3 times higher on average than white pedestrians

Male
pedestrians had rates of injury-related hospital 1.5 times higher on average than female pedestrians

*Reported federal fiscal year (FFY): Oct. 1 - Sep. 30 MA residents

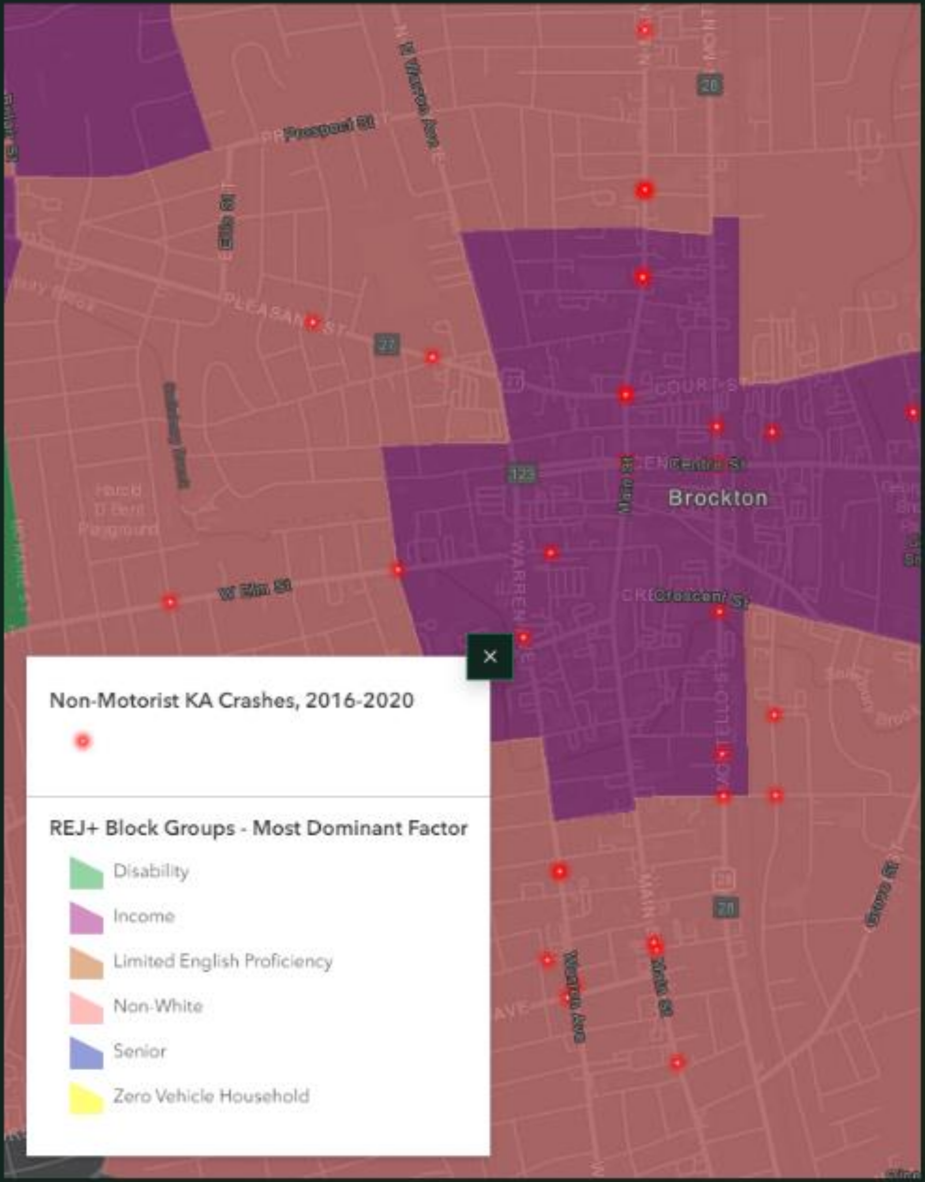
VRU KA Crashes and Regional Environmental Justice Locations (REJ+)

REJ+ KA Pedestrian Crashes:

- 50% all KA Pedestrian Crashes occurred in a REJ+ Community
- **Low Income** and **Non-White** are the Most Dominant Factors

REJ+ KA Bicycle Crashes:

- 38% all Fatal and Serious Injury Bicycle Crashes occurred in a REJ+ Community
- **Low Income** and **Non-White** are the Most Dominant Factors



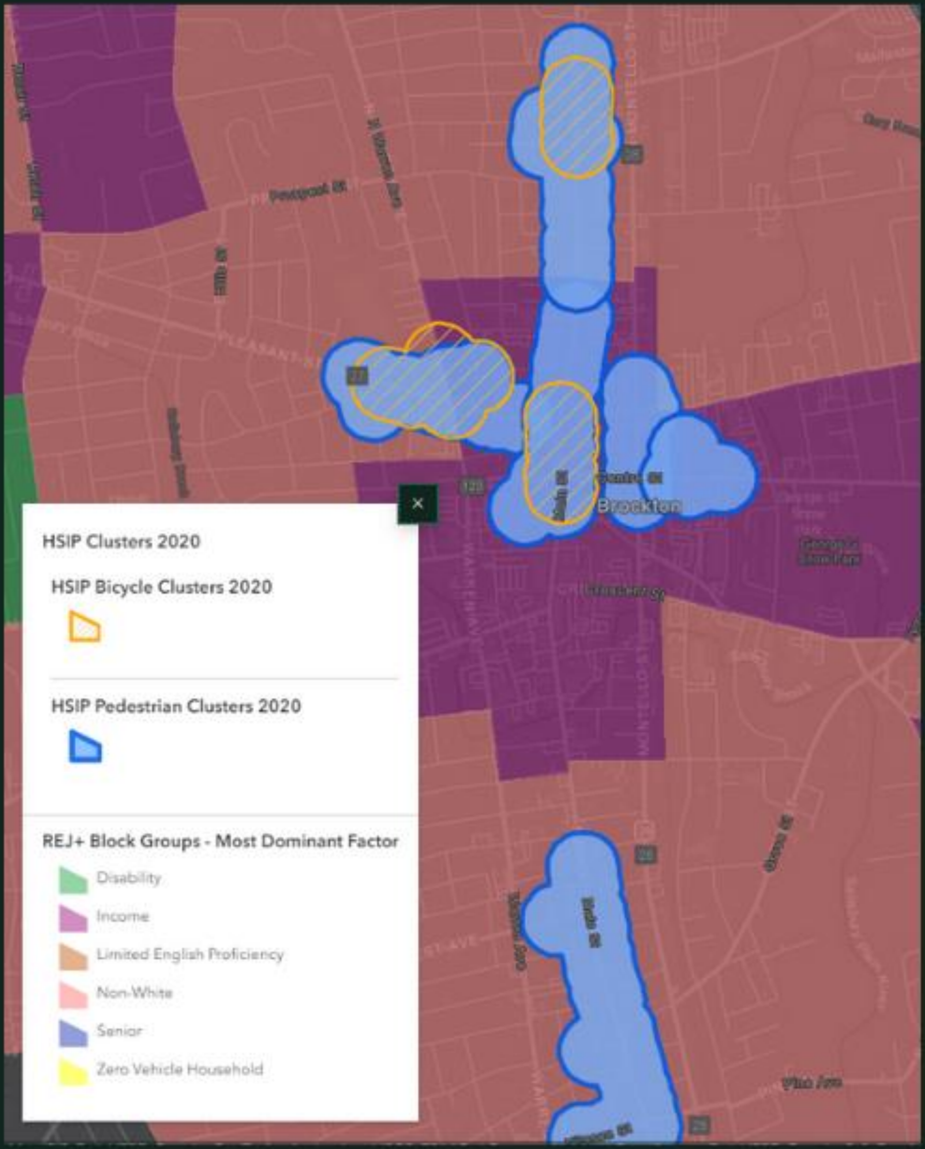
HSIP Clusters and Regional Environmental Justice Locations (REJ+)

REJ+ HSIP Pedestrian Clusters:

- 82% of HSIP Pedestrian Clusters are 50% or more REJ+ Community
- **Low Income** and **Non-White** are the Most Dominant Factors

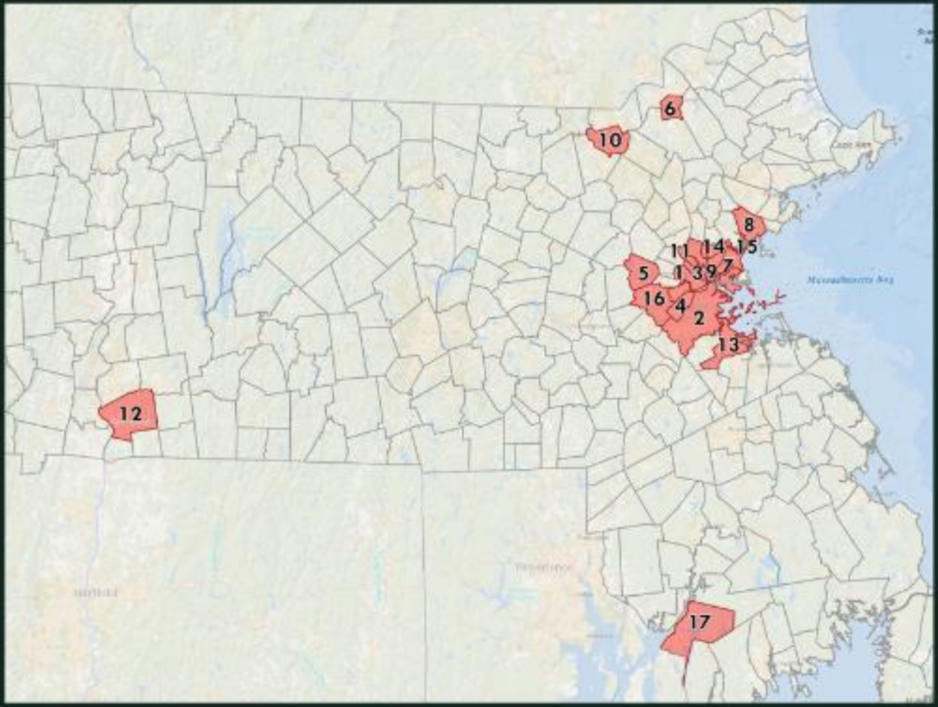
REJ+ HSIP Bicycle Clusters:

- 64% of HSIP Bicycle Clusters are 50% or more REJ+ Community
- **Low Income** and **Zero Vehicle Ownership** are the Most Dominant Factors



VRU Assessment Next Steps

- Top towns for VRU risks have been identified
- Outreach to MPOs and towns is in progress
- School zone speed signs and VRU bus stop projects currently underway.
- MassDOT to provide 4ft safe passing signage materials to towns
  - **119 Communities (3,144 Signs ordered)**
  - **MassDOT Districts (1,187 Signs ordered)**



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Thank you

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