

# 2023 Strategic Highway Safety Plan (SHSP)

A plan to improve safety on all public roads in Massachusetts





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Mass Office of Travel + Tourism,  
MassDOT, and VHB



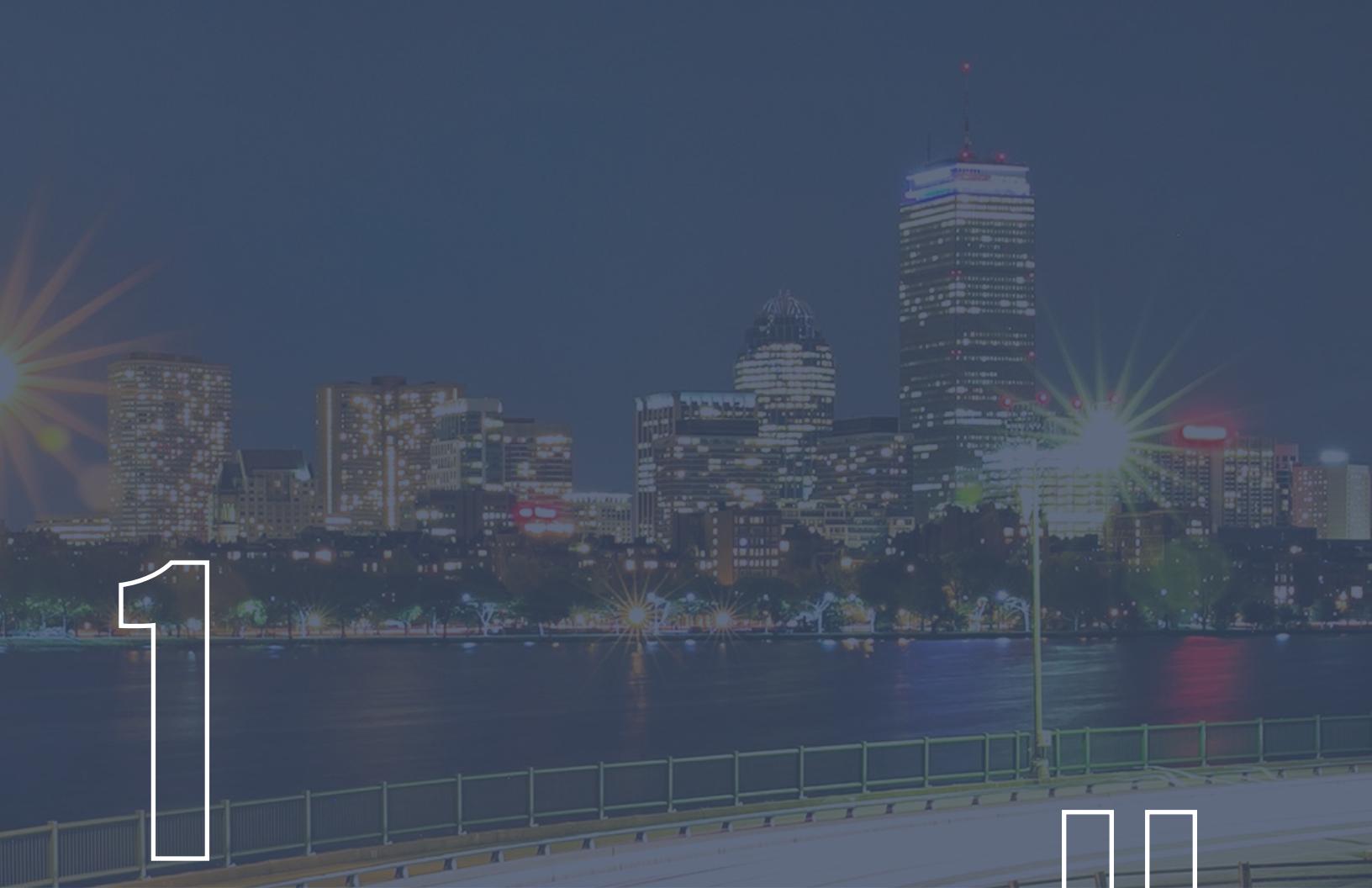
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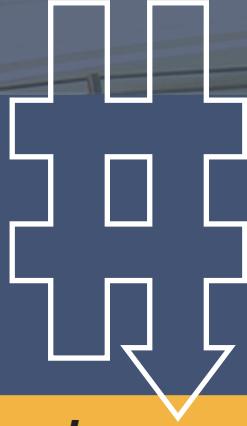
*Courtesy of Mass Office of Travel + Tourism*

A photograph of the Boston skyline at night, featuring the Prudential Tower and other illuminated buildings along the Charles River. Sunburst effects are visible around the lights.

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# Introduction

## Vision Zero & Safe System Approach



**In 2021, 418 people died and 2,884 people were seriously injured due to roadway crashes in Massachusetts—the highest number of annual deaths in 14 years.**

**The Commonwealth of Massachusetts' top priority is ensuring the safety of all roadway users:** whether they are driving a vehicle, truck, or motorcycle; riding as a passenger, taking transit, walking, bicycling, or using any other mobility device. One life lost or seriously altered on the Commonwealth's roadways is one too many. Massachusetts is committed to the goal of zero roadway fatalities and serious injuries. The 2023 Strategic Highway Safety Plan (SHSP) provides a framework for how the Commonwealth will work to make Massachusetts roadways safer for all people. No matter how people get around, it is essential that everyone feels safe traveling throughout the Commonwealth, regardless of age, ability, lived experience, or mode. This plan applies to all public roadways in Massachusetts ranging from residential streets to interstate highways, regardless of jurisdiction or functional classification.

*Everyone is accountable and has a role to play.*

**To achieve zero roadway fatalities and serious injuries, Massachusetts is adopting a Safe System Approach,** a U.S. Department of Transportation-endorsed framework for addressing roadway safety holistically as a system. A Safe System Approach works by anticipating human mistakes and keeping impact energy on the human body at tolerable levels. Critical to the success of the plan is identifying and mitigating risks in the transportation system to prevent serious crashes, rather than waiting for crashes to occur and reacting afterward. Implementing this approach requires shared responsibility across agencies and communities. Everyone is accountable and has a role to play, including those who plan, program, design, construct, maintain and utilize the roads, as well as those who create, enforce, and adjudicate laws. While road users share some of the responsibility, and must follow the rules of the road system, it is unacceptable to assign users complete responsibility for their safety on a system they do not plan, design, construct, operate, and maintain.

*In addition to the Safe System Approach, this SHSP prioritizes equity and collaboration.*

**Equity:** We have incorporated equity in all actionable efforts that flow from this plan. Equity means distributing resources to people in a just and impartial way. Actions will address the disproportionate harm that vulnerable populations and people of color often suffer on Massachusetts roadways. A robust analysis is needed to understand why current disparities exist. The Action Plan will seek to connect roadway fatality and serious injury data with possible factors and best practices to mitigate these disparities.

**Collaboration:** We are developing partnerships in all actionable efforts that flow from this plan. Partnerships include supporting municipalities and other public entities to address safety locally and regionally, especially considering most Massachusetts roadways (roughly 80%) are under local jurisdiction. Many municipalities have taken steps to address safety that the Commonwealth can amplify and learn from. Beyond state-municipal coordination, this plan also seeks to highlight how external partners and private industry can contribute to improving safety. No single actor can achieve Safe System goals alone, and stakeholders from the community, philanthropy, and business all play important roles.

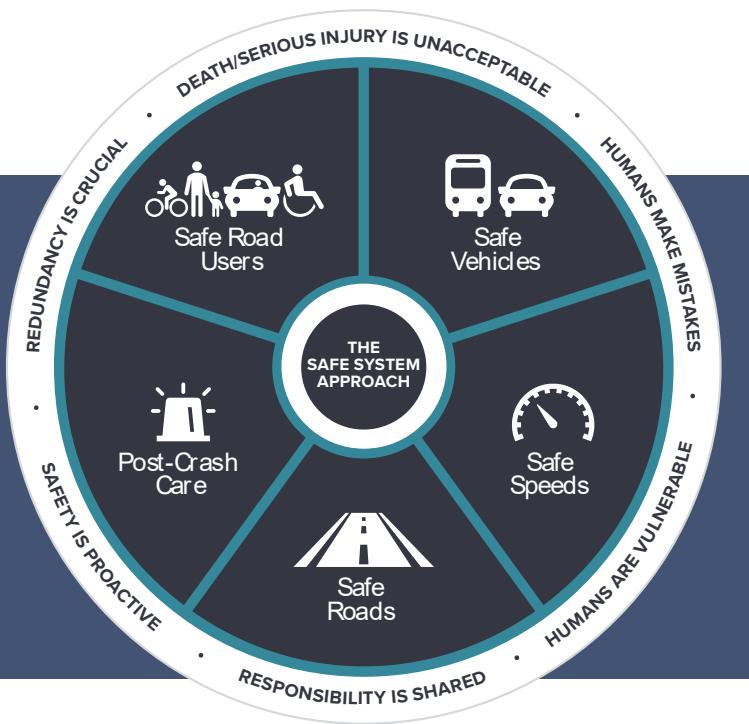


# Development of This Plan

The Federal Highway Administration (FHWA) and the Highway Safety Improvement Program (HSIP) (23 U.S.C. § 148) support each state by providing leadership and resources for the SHSP. Per Federal Legislation, the SHSP is to be updated every five years with the purpose of providing a comprehensive structure for reducing roadway deaths and serious injuries on all public roadways. Despite the name Strategic Highway Safety Plan, the plan does not solely focus on highways as defined by interstates and freeways, but all roadways—neighborhood local roadways, main streets, municipal roads, and state roads regardless of jurisdiction and functional classification.

The following SHSP was developed by the Commonwealth of Massachusetts through a multi-step process that engaged 270 people. First, an Executive Leadership Committee comprised of leaders from 18 agencies affirmed the Safe System Approach framework for this plan. Group discussions were then organized around 14 emphasis area topics identified from the previous SHSP. The 14 emphasis area groups generated over 400 ideas for input into the new SHSP.

*These 400 ideas were then synthesized and presented back to stakeholders who provided input via 5 meetings that focused on the Safe System Approach elements: Safe Roads, Safe Speeds, Safe Road Users, Post-Crash Care, and Safe Vehicles.<sup>1</sup> From these meetings, the ideas were further distilled and prioritized into 6 core initiatives with 31 actions aligned with the Safe System Approach.*



## EXECUTIVE LEADERSHIP COMMITTEE

- Executive Office of Elder Affairs
- Executive Office of Health and Human Services
- Executive Office of Public Safety and Security - Highway Safety Division
- Federal Highway Administration
- Federal Motor Carrier Safety Administration
- Massachusetts Association of Regional Planning Agencies
- Massachusetts Bay Transportation Authority
- Massachusetts Chiefs of Police Association
- Massachusetts Council on Aging
- Massachusetts Department of Fire Services
- Massachusetts Department of Public Health
- Massachusetts Department of Transportation Highway
- Massachusetts Department of Transportation Planning
- Massachusetts Department of Transportation Rail and Transit
- Massachusetts Department of Transportation Registry of Motor Vehicles
- Massachusetts Municipal Association
- Massachusetts State Police
- National Highway Traffic Safety Administration

<sup>1</sup> [https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA\\_SafeSystem\\_Brochure\\_V9\\_508\\_200717.pdf](https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf)

# SHSP Scope and Moving Toward Action

This SHSP identifies safety initiatives that the Commonwealth will turn into an Action Plan. While the SHSP forms the vision and guiding initiatives of the Commonwealth's work, an Action Plan will be developed to transform the SHSP's goals into detailed, actionable, and concrete efforts. The Action Plan will detail resources needed, staffing, and other responsibilities, as well as timelines to accomplish tasks and performance measures to ensure stakeholders stay on track and measure progress. Thus, in total, this SHSP and supplemental detailed Action Plan will guide operations, planning, and investment decisions that are determined to have the greatest potential to save lives and prevent injuries.

*The key to improving roadway safety is action and urgency.*

To place this new SHSP in context, the previous 2018 plan included a focus on a series of legislative policy proposals to reduce crashes resulting in death or serious injury. These measures were chosen for their potential to be high-leverage in how they target frequently occurring crash types and address the interconnected nature of crashes such as speeding, driver distraction, and impaired driving. The 2018 SHSP's legislative proposals included:



**Hands Free:** Allow law enforcement to stop and issue citations to motorists using mobile electronic devices.



**Primary Seat Belt:** Enable law enforcement to stop motorists who appear to not be wearing seatbelts.



**Work Zone Safety:** Enable variable speed limits in work zones and increase penalties for motorists who strike roadway workers.



**Ignition Interlock for All Offenders:** Statutorily allow judges to order ignition interlock devices for first time Operating Under the Influence (OUI) offenders.



**Truck Side Guards:** Require that trucks registered in Massachusetts, meeting certain criteria, have side guards.



**Automated Enforcement:** Give municipalities "opt in" authority to issue citations through the use of cameras and radar technology.

Of these, the Hands Free<sup>2</sup> and Work Zone Safety<sup>3</sup> provisions were passed into law. The Governor has filed several additional pieces of legislation to address roadway safety, but they have not passed the Legislature. This leaves many remaining legislative priorities outstanding. The 2023 SHSP reiterates the importance of the remaining legislative initiatives. As part of the solution to improve roadway safety, the importance of legislative action cannot be underestimated, even though this SHSP is not legislatively focused. This SHSP focuses on all types of possible solutions, and the supplemental Action Plan may recommend additional legislative proposals.

2 <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIV/Chapter90/Section13b>

3 <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIV/Chapter90/Section17D>

*Since the COVID pandemic, speeding-related serious injuries steadily increased, while the seat belt use rate in Massachusetts decreased in 2022.*

## Why This Plan is Needed Now

The COVID pandemic contributed to several years of upheaval, and there are many facets of the pandemic and link to roadway crashes that are unknown—including how it has impacted mental health or other wellness factors such as post-crash care—and whether these factors have in turn also influenced roadway crashes. Social distancing, workforce changes, and lockdowns changed how people engage with the transportation system during the pandemic, and the longer-term ripple effects on how we live and work are still yet to be seen. While direct causation cannot be attributed, riskier behavior became more prevalent. Since the COVID pandemic, speeding-related serious injuries steadily increased, while the seat belt use rate in Massachusetts decreased in 2022. Additionally, preliminary information indicated that impairment-related serious injuries increased. **Without making premature causal connections between severe crashes and the pandemic, urgent and coordinated action to prevent roadway deaths can still be taken.**

### Deaths and Serious Injuries are Rising

Roadway deaths reached a 14-year high in 2021, increasing year-over-year since 2019. Of these, preliminary analysis revealed that of the **2021 deaths** there were:

**5** people on bicycles

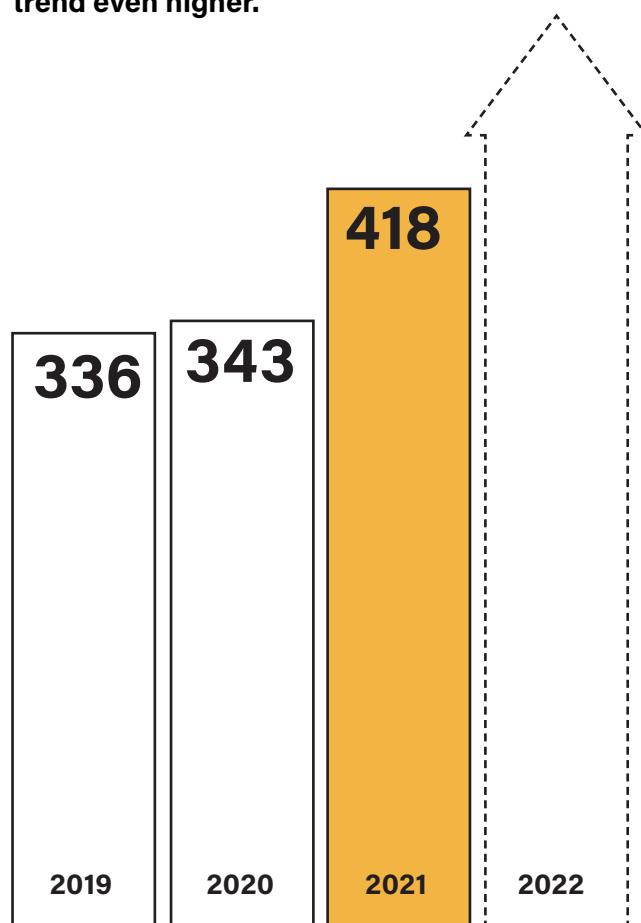
**76** pedestrians

**82** motorcycle operators or passengers  
(plus 1 additional ATV-related death)

**254** motor vehicle operators or passengers

Conditions on the Commonwealth's roadways became more dangerous during the pandemic, as total roadway deaths increased despite a decline of traffic volumes in 2020.

**Year-over-year people who have died due to roadway crashes in Massachusetts have been increasing and 2022 is expected to trend even higher.**



*Actual fatalities exceeded the targets set, further emphasizing the need to correct course and change the approach.*

The five-year rolling average of annual fatalities\* stayed relatively constant between 2013 and 2017 and increased in the most recent year, with the most recent average (2017-2021) resulting in 360 lives lost per year.<sup>4</sup> To understand the trend of fatalities occurring year after year, a statistical rate can be calculated by dividing the fatalities by the number of miles driven in Massachusetts that year, known as vehicle miles traveled (VMT). As a result, 0.59 fatal injuries occurred for every 100 million miles driven in Massachusetts between 2017 and 2021. It is important to note that the Massachusetts Department of Transportation (MassDOT) and the Executive Office of Public Safety and Security (EOPSS) are required to annually develop and submit safety performance targets to FHWA and the National Highway Traffic Safety Administration (NHTSA), respectively.

Figures 1 and 2 include the targets set nearly 3 years ago for 2017-2021 (355 fatalities and a fatality rate of 0.59), before COVID's impacts were experienced. This illustrates that the actual fatalities exceeded the targets set, further emphasizing the need to correct course and change the approach.

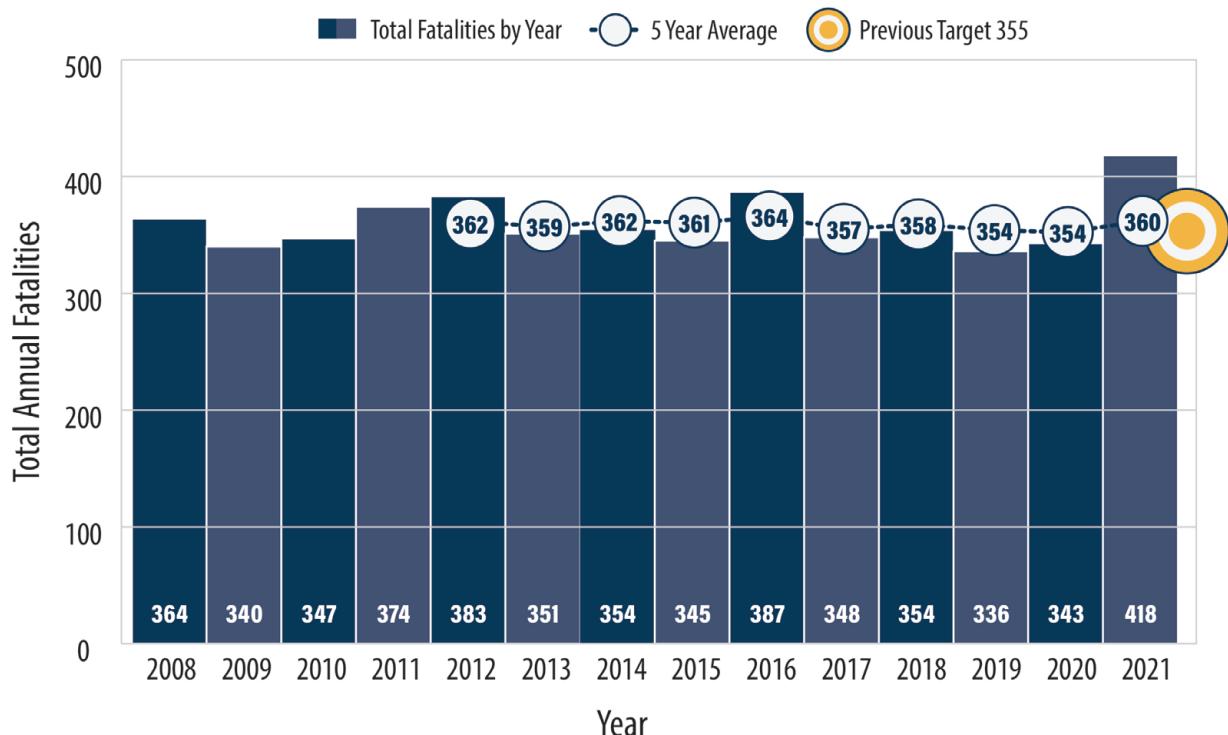


Figure 1. Motor Vehicle Fatalities by Year and Five-Year Average\*\*

\*\*Yearly data represents the final year within the noted five-year average

\*Fatality data comes from the Fatality Analysis Reporting System (FARS) and captures unintentional, motor vehicle fatalities.

4 <https://apps.impact.dot.state.ma.us/cdp/home>

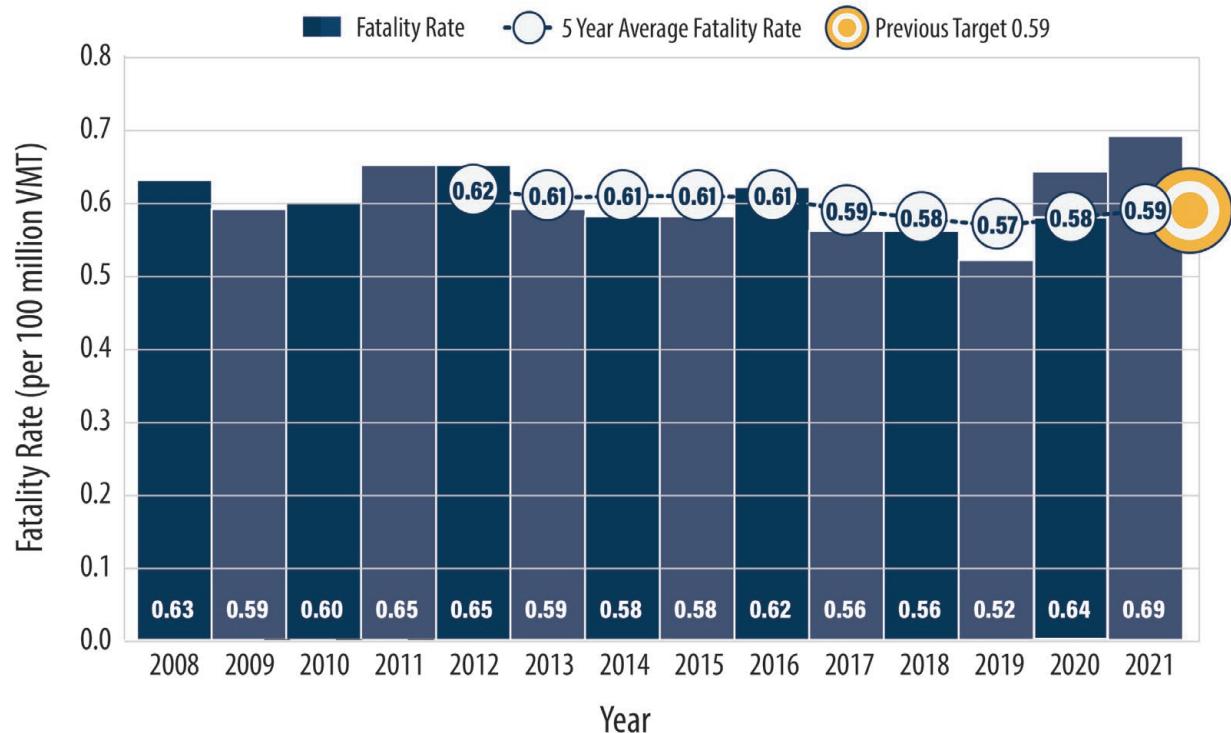
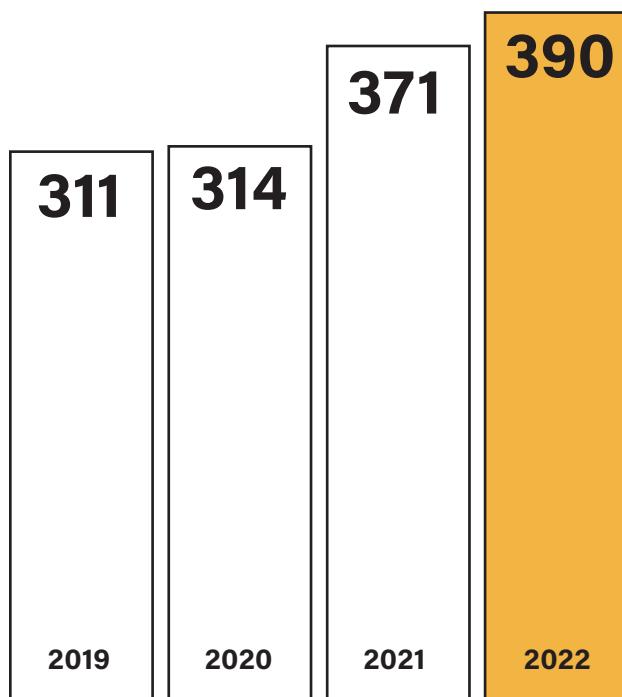


Figure 2. Motor Vehicle Fatality Rate and Five-Year Fatality VMT Rate\*

\*Yearly data represents the final year within the five-year average



Early projections suggest 2022 is trending to be the worst year in recent history.

Year-to-date (January – November) comparisons for people who have died due to roadway crashes in Massachusetts from 2019-2022.

*Like fatalities, the actual serious injuries exceeded the set targets.*

Serious injury data analyzed from IMPACT demonstrated a downward trend in the five-year rolling average of annual serious injuries. However, year-to-year serious injuries have increased since 2018, with the exception of 2020. These compounded trends demonstrated a slowing rate of reduction for serious injuries. As noted for fatalities, MassDOT and EOPSS are required to annually develop and submit safety performance targets to FHWA and NHTSA, respectively. Similarly, Figures 3 and 4 include the targets set almost 3 years ago for 2017-2021 (2,569 serious injuries and a serious injury rate of 4.25), prior to the COVID pandemic. Like fatalities, the actual serious injuries exceeded the set targets.

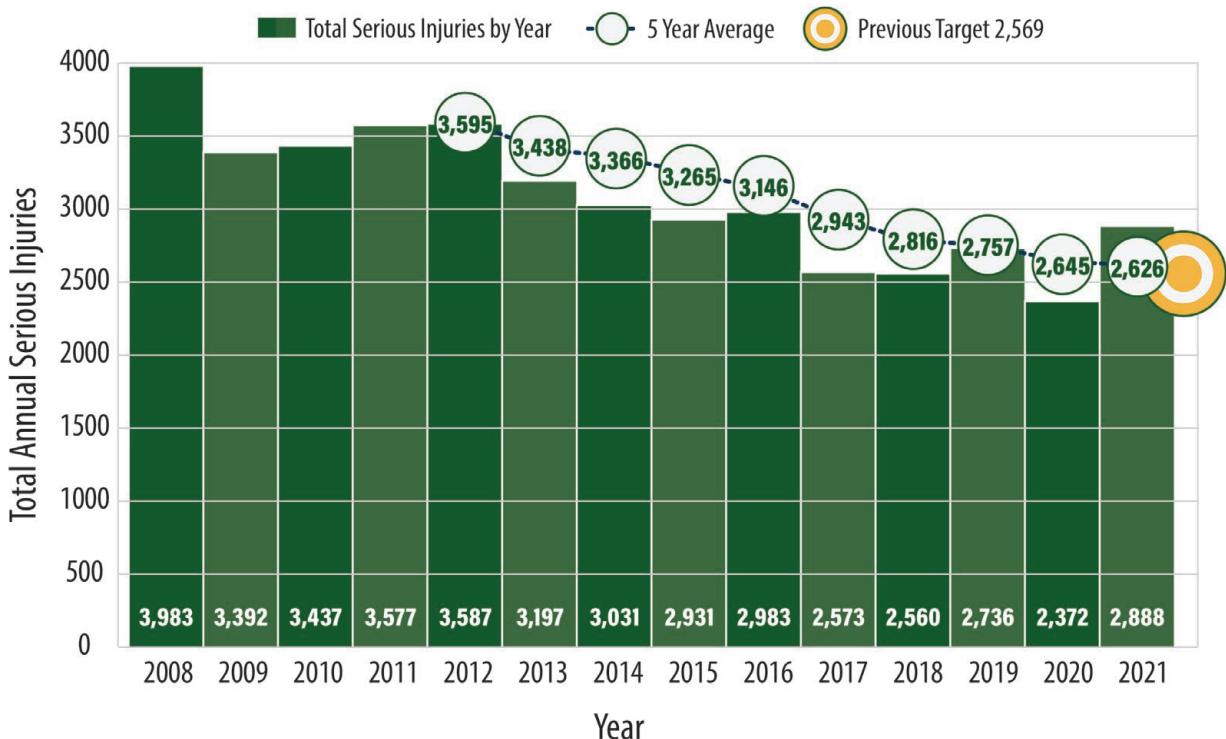


Figure 3. Motor Vehicle Serious Injuries by Year and Five-Year Average\*

\*Yearly data represents the final year within the noted five-year average

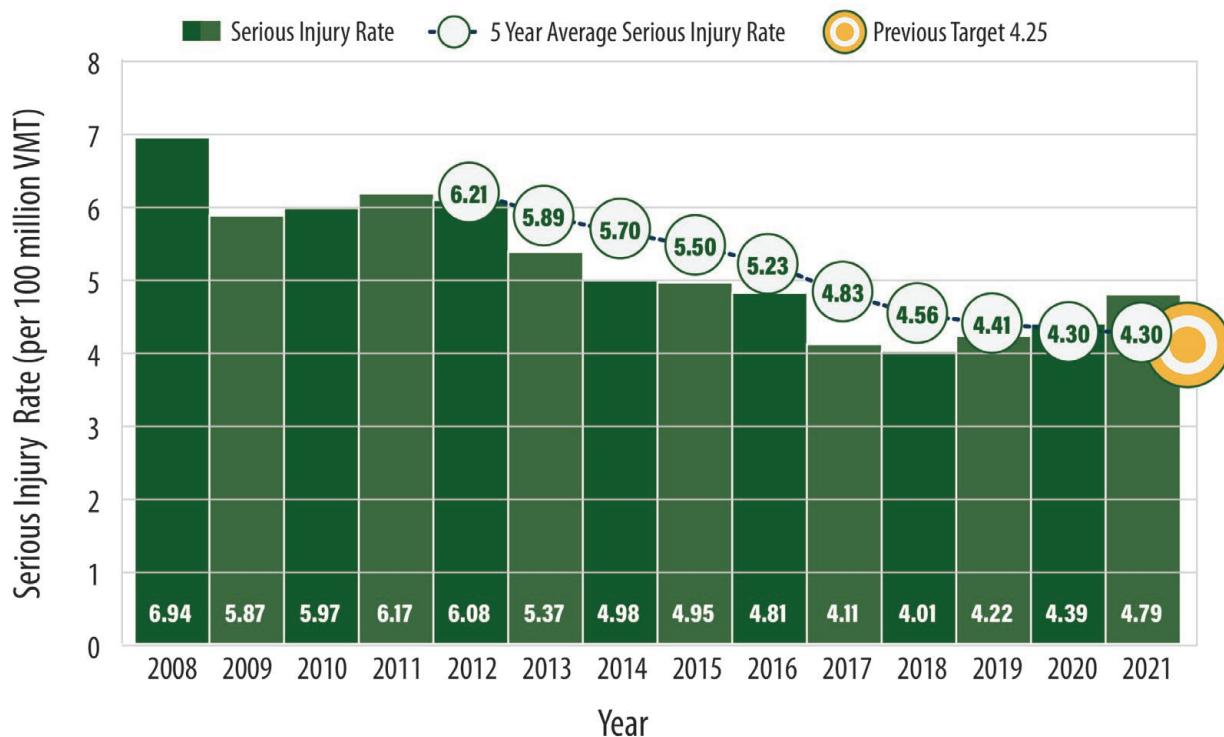
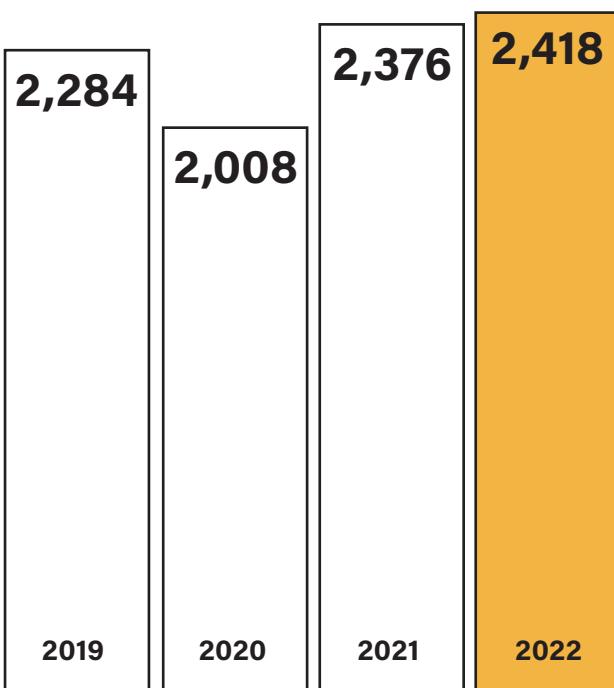


Figure 4. Motor Vehicle Serious Injury Rate and Five-Year Serious Injury VMT Rate\*

\*Yearly data represents the final year within the noted five-year average



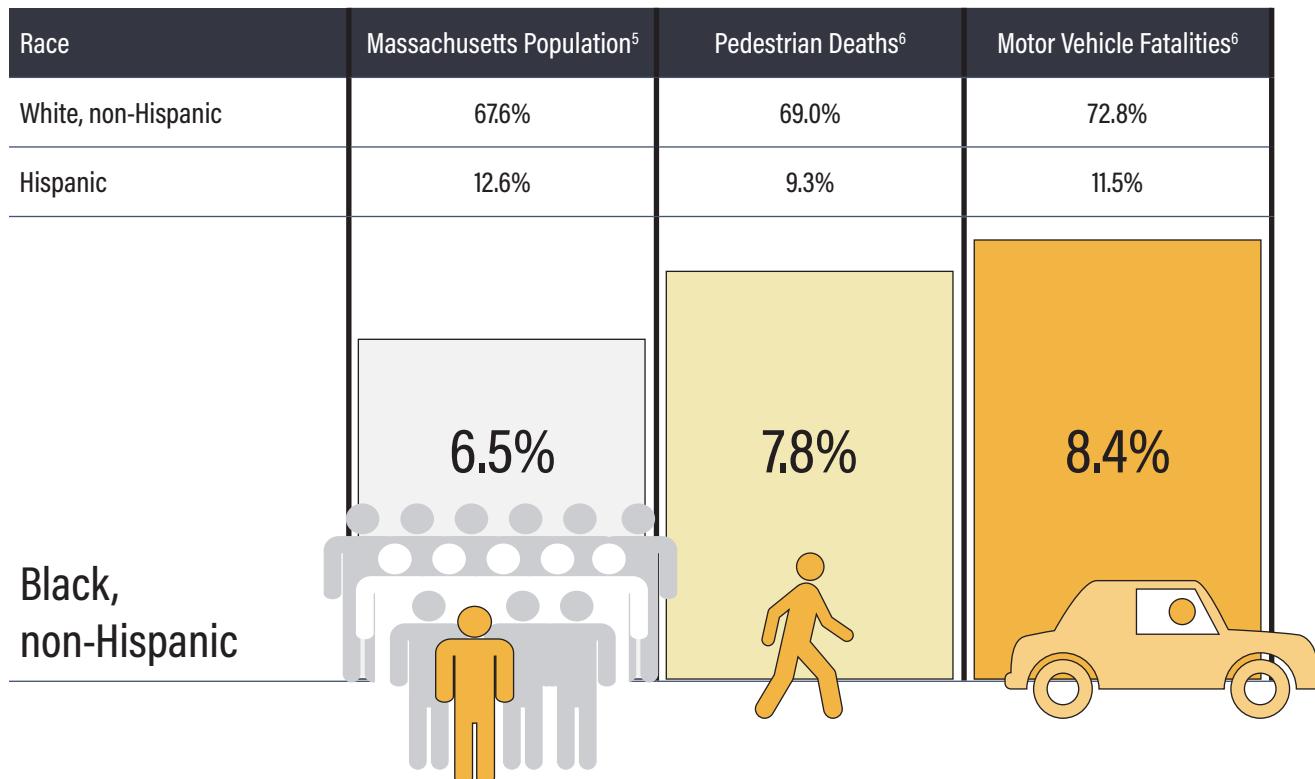
Similar to fatalities, early projections suggest 2022 is trending to be the worst year in recent history for serious injuries.

Year-to-date (January – October) comparisons for people who have serious injuries due to roadway crashes in Massachusetts from 2019-2022.

Preliminary data analysis also appears to reveal significant racial disparities among some of the crash types. Possible contributing factors and reasons for these disparities are complex and may include historical roadway design and investment policies; it is the intention of the supplementary Action Plan to explore the linkages between these findings and public health/other data sources that pertain to racial disparities.

*Solely considering data from the Fatality Analysis Reporting System (FARS), Black people accounted for 8.4% of all motor vehicle-related deaths in 2019 and 2020 despite only comprising 6.5% of the Massachusetts population, according to the 2020 census. This trend was similar among pedestrian deaths, with Black/African Americans accounting for a higher proportion of pedestrian deaths than their population share.*

Table 1. Racial Disparities in 2020 Pedestrian Deaths



5 <https://www.sec.state.ma.us/census2020/index.html>

6 <https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars>

*From FY 2016-2020, the inequity by race was even more extreme for non-fatal pedestrian crashes that resulted in hospitalization.*

As illustrated in Figure 5, Black (non-Hispanic) people experienced non-fatal pedestrian injury rates (12.7 hospital stays / 100,000 residents) at nearly three times the rate as White (non-Hispanic) people (4.6 hospital stays / 100,000 residents) and Hispanics at nearly two times the rate (7.6 hospital stays / 100,000 residents). More robust analysis is needed to understand why current disparities exist. The Action Plan seeks to connect roadway death and serious injury data with possible factors and best practices to mitigate these disparities.

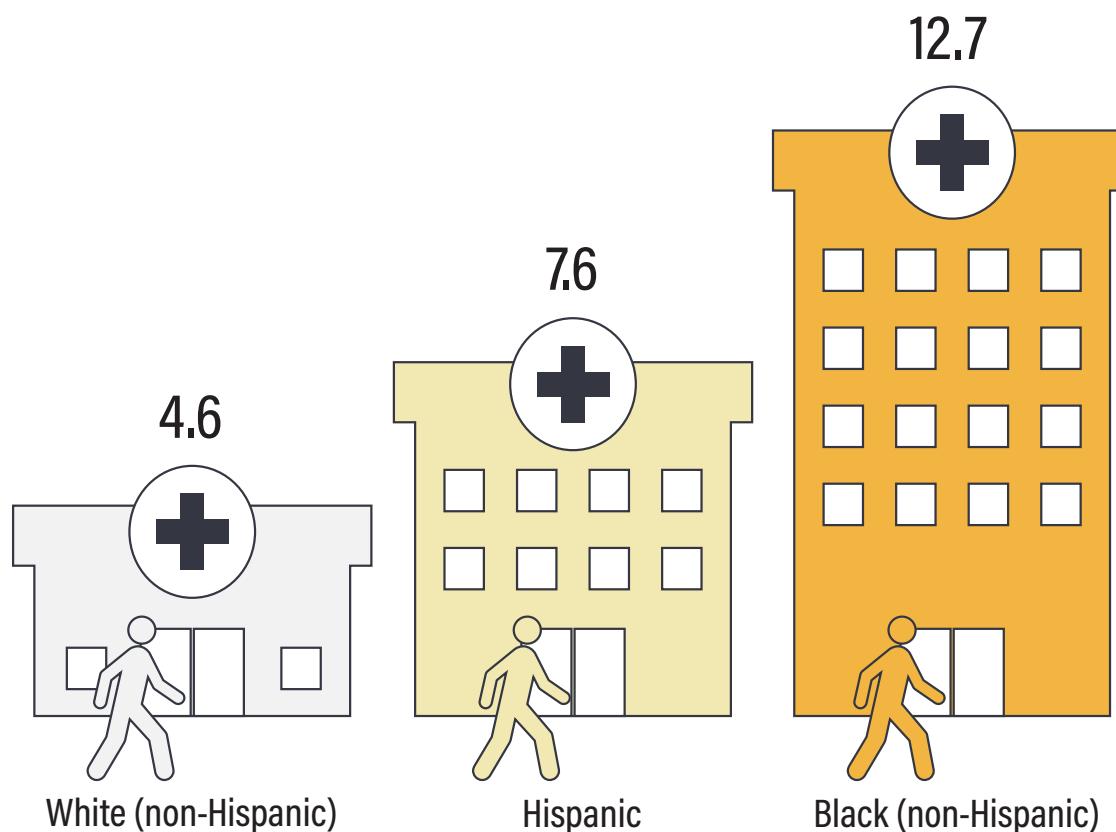


Figure 5. Non-Fatal Pedestrian Hospitalization Rate\* by Race<sup>7</sup>  
(\*) Rate is hospital stays per 100,000 residents

<sup>7</sup> <https://www.mass.gov/injury-surveillance-program>

A further breakdown of the fatalities and serious injuries is available by crash types defined in the previous SHSP: Lane Departure Crashes, Impaired Driving, Occupant Protection, Speeding and Aggressive Driving, Intersection Crashes, Pedestrians, Older Drivers, Motorcycles, Younger Drivers, Large Truck-Involved Crashes, Driver Distraction, Bicyclists, Safety of Persons Working on Roadways, and At-Grade Rail Crossing, as shown in Table 2.

*Table 2. Fatalities and Serious Injuries Per Year by Common Crash Types, 2016-2021*

Common Crash Types	Fatalities <sup>8</sup>						Serious Injuries <sup>9</sup>					
	2016	2017	2018	2019	2020	2021*	2016	2017	2018	2019	2020*	2021*
Lane Departure	195	181	193	178	174	n/a	671	603	603	662	704	749
Impaired Driving	119	116	122	112	98	n/a	236	187	210	229	212	259
Occupant Protection	96	133	106	96	98	n/a	366	318	347	349	357	446
Speeding Related	126	103	100	78	97	n/a	191	129	134	150	197	229
Intersection	94	90	121	84	77	n/a	1,079	957	920	1,029	804	984
Older Driver (65+)	76	57	68	85	93	n/a	558	498	505	538	421	512
Pedestrian	79	72	78	77	55	76	329	309	290	309	232	249
Motorcycle	44	51	57	46	58	82	310	268	236	319	334	340
Young Driver	53	42	28	31	37	n/a	394	345	290	392	347	429
Truck Involved	38	31	37	44	25	n/a	173	171	155	172	127	167
Distracted Driving	28	32	35	21	38	n/a	284	221	212	253	243	219
Bicycle	10	12	4	5	10	5	107	96	82	116	92	114
Work Zone	6	2	5	7	9	n/a	62	60	44	53	39	58
Grade Crossing	0	1	1	0	0	n/a	2	0	2	1	2	3

(\*) Preliminary data

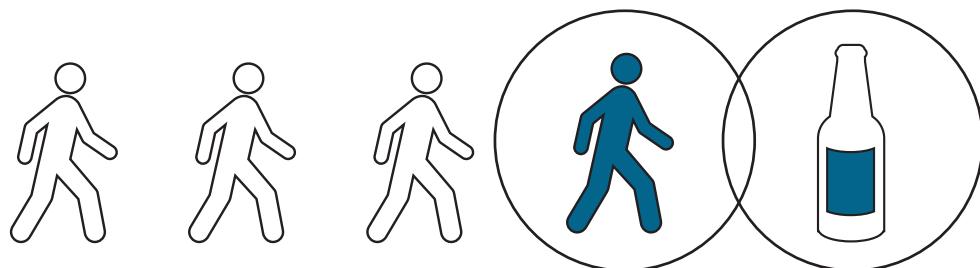
Much like the yearly data for all fatalities and all serious injuries, this data demonstrated increases in fatalities and/or serious injuries among most of these crash types in recent years.

8 <https://cdan.dot.gov/query>; <https://apps.impact.dot.state.ma.us/cdp/dashboard-view/2047>

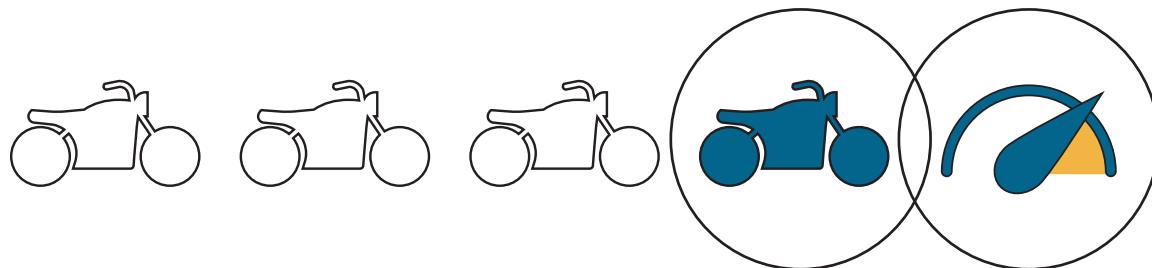
9 <https://apps.impact.dot.state.ma.us/cdp/dashboard-view/24>

*It is important to note that often a fatality or serious injury may be counted in more than one crash category.*

For example, approximately **one in every four pedestrian deaths and hospitalizations involved alcohol impairment (0.08 g/dL)** by the pedestrian or driver in 2020.<sup>10</sup>



Or, more than **25% of motorcycle deaths and serious injuries involved a motorcyclist driving too fast for conditions or exceeding the authorized speed limit.**<sup>11</sup>



And, high school students were surveyed for the Youth Health Survey. Preliminary results show:<sup>12</sup>

In 2021, 1 in 4 “drove after using marijuana in the past 30 days”

In 2021, 1 in 6 “never, rarely or sometimes wore a seat belt”

In 2019, nearly 40% “texted or emailed while driving in the past 30 days”



10 <https://www.mass.gov/orgs/department-of-public-health>

11 <https://apps.impact.dot.state.ma.us/cdp/home>

12 <https://www.mass.gov/lists/massachusetts-youth-health-survey-myhs>

## Alcohol and Drug Impaired Driving<sup>13</sup>



**42%** of hospitalized drivers between the **ages of 21 and 44** were identified as **intoxicated by alcohol/drugs**.



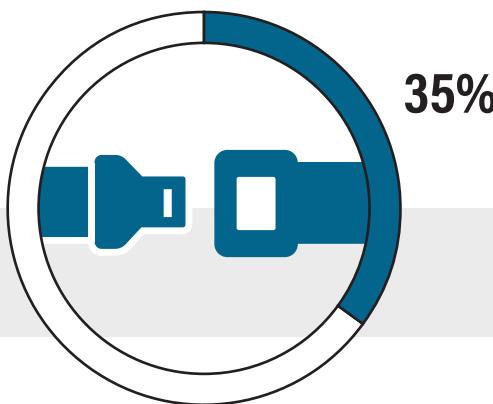
**27%**



**25%**

Driver hospitalizations in 2020 indicated that **27% of passenger vehicle drivers** and **25% of motorcyclists** were under the **influence of alcohol and/or drugs**.

## Occupant Protection<sup>14</sup>



**35% of deaths** in Massachusetts involved **unrestrained drivers** and **unrestrained front seat passengers** (2019).

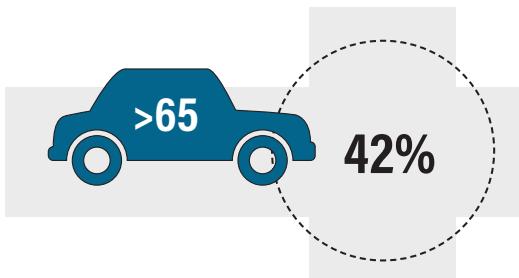


**23% of drivers** and **front seat passengers** were **not belted** in the most recent statewide observation study (2022).

13 <https://www.mass.gov/injury-surveillance-program>

14 <https://www.mass.gov/doc/2022-massachusetts-safety-belt-usage-observation-survey/download>

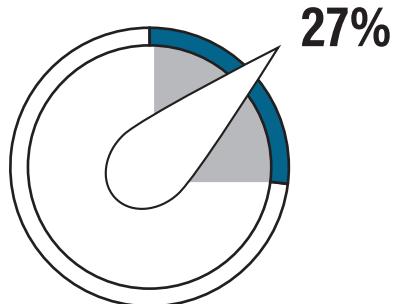
## Older Drivers<sup>15</sup>



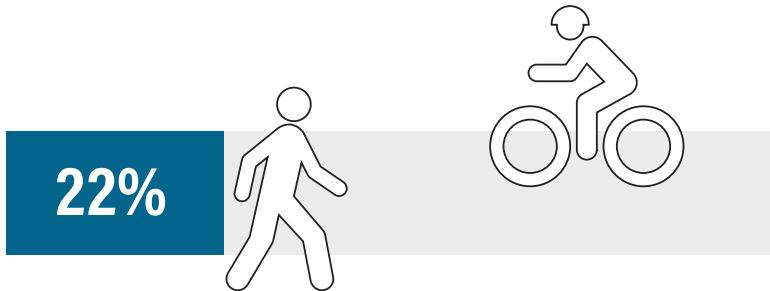
**42% of fatal or serious injury crashes** involving an **older driver** occurred at an **intersection**, a higher proportion compared to drivers of any age (33%).

## Speeding<sup>15</sup>

According to NHTSA, in 2019,  
**speeding was a factor in 27% of fatal  
crashes among teen drivers 15–18 years.**  
The rate of these deaths among **males**  
**was nearly double that of females.**



## Pedestrians and Bicyclists<sup>16</sup>



**22%**

In the last 5 years,  
**people walking** and  
**biking** accounted  
for almost **22% of  
deaths** on the  
roadways.

Past efforts focused on individual emphasis areas and specific crash sites as a reactionary approach to address safety issues. While there was some cross-over and collaboration among the actions to address each emphasis area, there is an opportunity to incorporate a more proactive approach to help reverse the current trends of rising deaths and serious injuries. Additionally, there were unanticipated social and economic challenges that impacted roadway safety during the pandemic. **Therefore, Massachusetts is adopting a new approach for this current plan – the Safe System Approach.**

<sup>15</sup> <https://apps.impact.dot.state.ma.us/cdp/home>

<sup>16</sup> MA Registry of Motor Vehicles Crash Data System and Merit Rating Board Citation Data, 2019-2021

# The Safe System Approach

The Safe System Approach aims to eliminate roadway fatalities and serious injuries by focusing on Safe Roads, Safe Road Users, Safe Vehicles, Effective Post-Crash Care, Safe Speeds, and changing safety culture. Work within these areas is guided by six principles (as described by FHWA):<sup>17</sup>

## SAFE SYSTEM PRINCIPLES



### Death/Serious Injury is Unacceptable

While no crashes are desirable, the Safe System Approach prioritizes crashes that result in death and serious injuries, since no one should experience either when using the transportation system.



### Humans Make Mistakes

People will inevitably make mistakes that can lead to crashes, but the transportation system can be designed and operated to accommodate human mistakes and injury tolerances and avoid death and serious injuries.



### Humans are Vulnerable

People have limits for tolerating crash forces before death and serious injury occurs; therefore, it is critical to design and operate a transportation system that is human centric and accommodates human vulnerabilities.



### Responsibility is Shared

All stakeholders (transportation system users and managers, vehicle manufacturers, etc.) must ensure that crashes don't lead to deaths or serious injuries.



### Safety is Proactive

Proactive tools should be used to identify and mitigate latent risks in the transportation system, rather than waiting for crashes to occur and reacting afterwards.



### Redundancy is Crucial

Reducing risks requires that all parts of the transportation system are strengthened, so that if one part fails, the other parts still protect people.

Washington Street, Brookline, Massachusetts. Source: VHB



<sup>17</sup> [https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA\\_SafeSystem\\_Brochure\\_V9\\_508\\_200717.pdf](https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf)

# Safe System Approach in Action

*Many countries and cities have been able to significantly reduce or reach zero roadway deaths by using the Safe System Approach.*

*Small changes  
that are "not  
earth-shattering in  
their complexity  
are really important  
in changing the  
game in terms of  
transportation  
safety."*

## HOBOKEN, NEW JERSEY

**Hoboken, New Jersey, a dense city of 50,000, has not had a single traffic-related death in 4 years.** Through years of outreach, engineering and community work, Hoboken's multifaceted approach to safety has established community buy-in and involvement in creating a network of safety improvements. Hoboken's Director of Transportation and Parking proclaimed that small changes that are "not earth-shattering in their complexity are really important in changing the game in terms of transportation safety." The city's team relies on data to reveal problem points where multiple crashes in one location indicate that more attention is needed.

Engineering projects have included shortening crossing distance at many intersections for pedestrians, as well as focusing investments around schools, daycares, playgrounds, and buildings for senior citizens. Parking spaces are positioned away from crosswalks so that pedestrians have better sight lines to the street, while back-angle parking helps drivers see as they pull out of spaces. Traffic signal timing changes have reduced possible conflicts between drivers and pedestrians. Strict traffic enforcement has also been a factor while car speeds have been reduced.<sup>18</sup>

*Complete Streets improvements on rural road. Source: Gregg Shupe, ShupeStudios.com*



<sup>18</sup> <https://www.nbcwashington.com/news/local/what-hoboken-can-teach-cities-about-street-safety/3028937/>

*Americans are nearly three times as likely to die in a traffic crash as French people. This is not a result of significant degradations to road safety in the U.S., but significant improvements in France.*

## FRANCE

**Road safety in France was once like the U.S. with similar per capita traffic death rates as recently as the 1990s.** While conditions have improved in both countries over the last few decades, as of 2021, Americans are nearly three times as likely to die in a traffic crash as French people. This is not a result of significant degradations to road safety in the U.S., but significant improvements in France.

The success of France's approach to safety can be attributed to several reasons. In 2002, France implemented automated speed camera enforcement on roadways across the nation and embraced the widespread adoption of traffic circles (a form of a roundabout) which have been effective in reducing the severity of crashes. Consistent with the Safe System element of Safe Roads, the French government also made streets and city centers safer for pedestrians. Overall, driving decreased due to vehicle and gasoline regulations as well as more pedestrian-friendly streets. By completely removing motor vehicles from pedestrian-heavy areas, the likelihood of a pedestrian-vehicle collision is reduced to zero. In line with the Safe System element of Safe Vehicles, the government created a separate vehicle weight fee for the heaviest cars exceeding 4,000 pounds, as heavy vehicles have more potential for causing death or serious injuries. This aligns with the Safe System principle that Humans are Vulnerable.<sup>19</sup>

*Roundabout near the University of Massachusetts, Amherst. Source: VHB*



<sup>19</sup> <https://www.bloomberg.com/news/articles/2022-06-16/why-france-offers-lessons-for-road-safety-in-the-us#:~:text=Today%20there%20are%20around%20eight,USA%20there%20are%20about%20144>

*Norway doubled down on road safety education in schools and took steps to create a driver education system focused on roadway safety.*

*The  
"Roundabout  
City"*

## NORWAY

**Norway, a country with a population of 5.3 million people (compared to 6.8 million in Massachusetts), doubled down on road safety education in schools and took steps to create a driver education system focused on roadway safety, which aligns with the Safe System element of Safe Road Users.** Norway experienced a fourfold decline in roadway deaths since 1985, from 482 to 110 in 2019. Fatalities continued to decrease to 93 in 2020.

In 2019, Oslo, the Capital City of Norway with a population of one million, experienced zero pedestrian and cyclist fatalities and only one driver fatality. Broader policies to reduce car use had a role in this reduction, but Oslo also instituted speed management practices to slow maximum speeds to 18 mph (30km/h) around schools.<sup>20</sup>

## CARMEL, INDIANA

Also known as the "Roundabout City," Carmel's population is approximately 100,000 people. **Approaching roadway safety from a design perspective, which aligns with the Safe System element of Safe Roads, Carmel installed over 100 roundabouts along busy corridors.** This strategy has been credited with reducing emissions, easing traffic flow, and reducing injury crashes by 84% while also reducing all crashes at these locations by two-thirds.<sup>21</sup>

## WORLD RESOURCE INSTITUTE INFORMATION

Analysis in 53 countries found that those that have taken a Safe System Approach to traffic safety have achieved both the lowest rates of deaths per 100,000 inhabitants and the greatest reduction in deaths over the past 20 years.<sup>22</sup>

*Roundabout on RT 140, Princeton, MA. Source: MassDOT*



20 <https://www.theguardian.com/world/2020/mar/16/how-helsinki-and-oslo-cut-pedestrian-deaths-to-zero>

21 <https://www.iihs.org/news/detail/unusual-design-slashes-injury-crashes-for-roundabout-city>

22 <https://www.wri.org/cities/health-road-safety>

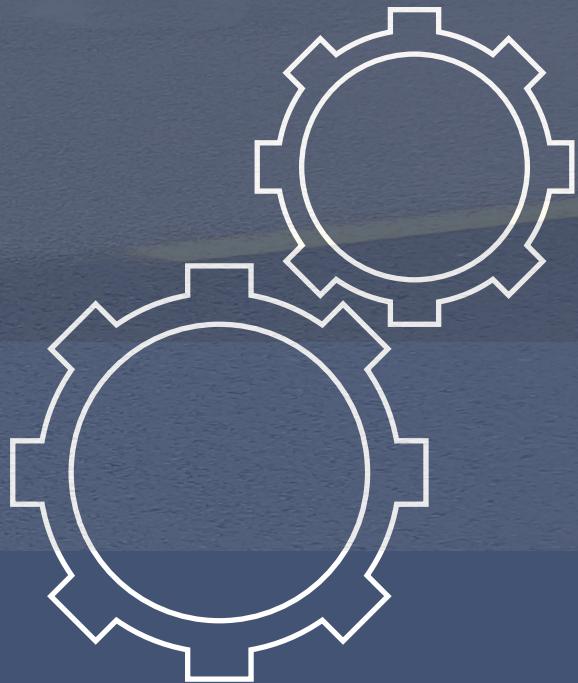


*High friction surface treatment application in a work zone. Source: MassDOT*



2

## SHSP INITIATIVES



To create safer roadways, the Commonwealth is pursuing the following **six initiatives** for coordinated multi agency and organization implementation.

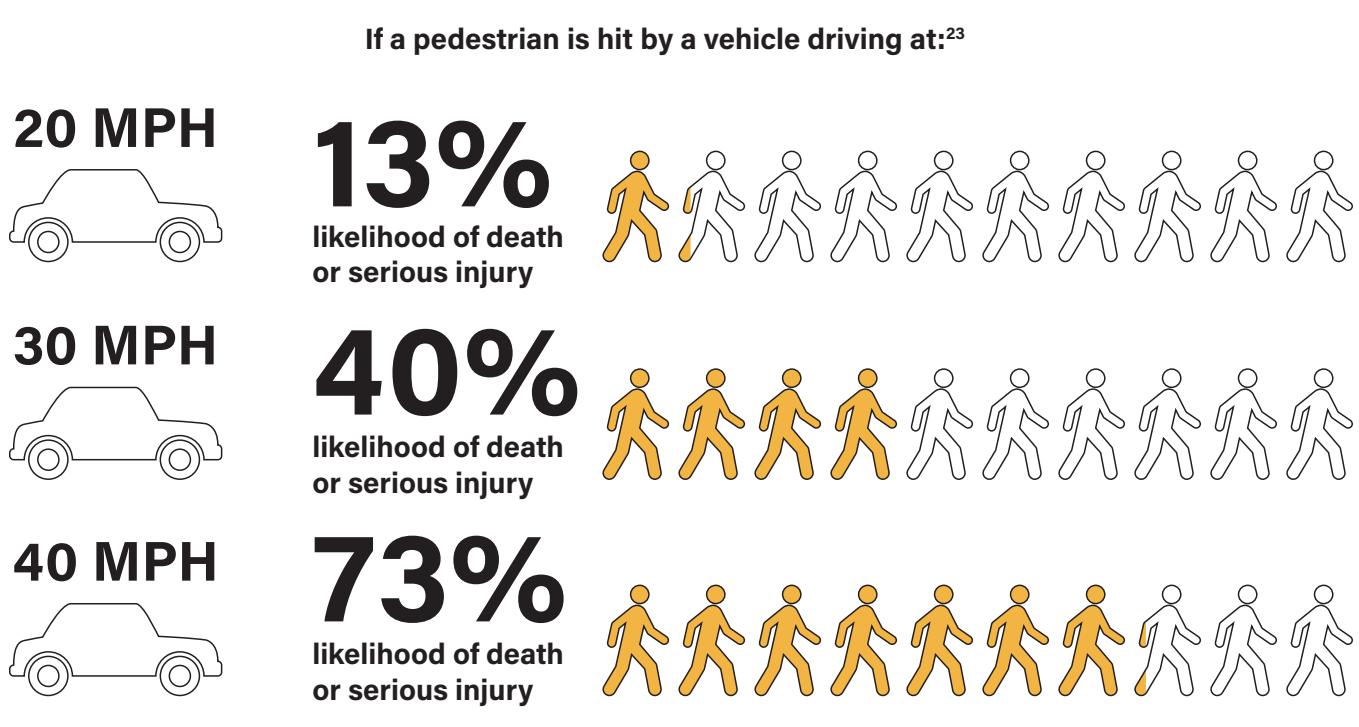
1. Implement Speed Management to Realize Safer Speeds
2. Address Top-Risk Locations and Populations
3. Take an Active Role to Affect Change in Vehicle Design, Features, and Use
4. Accelerate Research and Adoption of Technology
5. Double Down on What Works
6. Implement New Approaches to Public Education and Awareness



## Implement Speed Management to Realize Safer Speeds

*Speed management is critical to achieving the Commonwealth's vision of a safe transportation system with zero roadway deaths and serious injuries.*

Speed management (including but not limited to road diets, roundabouts, and automated enforcement) is an approach to address speeding and speed-related concerns. **Lower speeds reduce the likelihood of deaths or serious injuries.** Additionally, effective speed management is critical for creating roadways that support safe, comfortable, and convenient travel for everyone—whether they are traveling by car, bicycle, on foot, in a stroller, taking public transit or using an assistive mobility device.



*Higher speeds increase the likelihood that a crash will result in death or serious injury.*

Each 10 mph increase in vehicle speed is associated with a 30% increase in potential loss of life or serious injury in a pedestrian-vehicle crash. Pedestrian death and serious injury risk increases from 13% when struck by a vehicle at 20 mph to 40% when struck at 30 mph, and 73% at 40 mph.<sup>23</sup> **Experiencing a head-on collision at 55 mph induces forces that are comparable to falling from the 10th floor of a building.**

Following the pandemic, speed-related serious injuries increased. However, it should be noted that speeding as a causal factor is often not included in crash reports. Detailed crash reconstruction is not typically performed for serious injury crashes as frequently as it is for fatal crashes. Therefore, speeding as a factor in serious injury crashes may be underreported. Posted speed limits may have been established from a speed regulation created decades ago and may no longer be the most appropriate speed for the current conditions. So even a driver traveling at the posted speed limit may be driving too fast for conditions. While it is difficult to cite a driver for "driving too fast for conditions" when the conditions are not weather-related, the combination of high speeds in a high-risk environment does not promote a safe roadway. As such, speed management is critical as part of the Safe System Approach.

The following SHSP-recommended steps aim to proactively implement speed management, whether through actions that state agencies can directly execute or through support that the Commonwealth can provide to community partners.

<sup>23</sup> Brian C. Tefft, *Impact Speed and A Pedestrian Risk of Severe Injury or Death*, 2013



### ***1.1 Evaluate and adjust operating speeds through roadway designs that are self-enforcing consistent with the new 2022 MassDOT speed management approach***

In 2022, Massachusetts released a process for evaluating and adjusting operating speeds while also providing municipalities with resources (specifically information and funding) to implement speed management programming. Now it is time to implement this programming to apply safer driver operating speeds and design roadways 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)***

The new speed management approach defines a procedure for target speed setting. Next, guidance and procedures regarding Target Speed and its relationship to Design Speed need to be codified. The goal is a target speed that reflects roadway conditions, land use, and multi-modal uses by working with communities to decide safe speeds, while trying to lower vehicle driving speeds to appropriate levels. This represents a major change in direction, as historically MassDOT and many other transportation agencies have relied on a system that established design speed (and in some cases, speed limits) based primarily on existing travel speeds, rather than what the appropriate safe target speed should be regardless of existing travel speed conditions. Upon implementation, this new approach will be used to prioritize human life and safety, while also recognizing the need to work with communities to bring about speed changes, raise awareness through public education, and set speed limits through speed zoning.

### ***1.3 Amend Massachusetts regulations related to speed (expand the definition of a school zone, adjust speed limit setting, modify statutory speeds)***

To reduce speeds to safer levels, certain regulations must be altered to better account for Safe System and speed management principles. For example, the definitions for school zones (which require reduced vehicle speed limits) need to be altered to accommodate more times of day, extended distance from the school, and the types of schools where regulations can be applied (currently only K-8). The Commonwealth's speed limit setting process can be adjusted to prioritize safety over vehicle speed and revisit statutory speed setting.





## Address Top-Risk Locations and Populations

*One principle of the Safe System Approach is that safety is proactive, rather than reactive.*

This means **mitigating risks to prevent serious crashes rather than just responding to a roadway crash after it occurs**. The Commonwealth will identify and address locations with the top risk for fatal and serious injury crashes, as well as top-risk populations. Additional research is needed to understand the discrepancies between the various populations. Many steps can be taken to expand upon existing safety work such as prioritizing projects in areas determined to have high crash risk.

## **2.1 Identify, initiate, and prioritize systemic projects involving top-risk locations**

In 2021, MassDOT developed risk models to identify where fatal and serious injury crashes were more likely to occur, rather than only where crashes have already occurred. This is based on several factors, including roadway, community, demographic, socioeconomic, and other characteristics. The SHSP update process reemphasized the importance of the work to improve safety at top-risk locations. The Commonwealth will partner with communities in top-risk areas to advance systemic safety improvements.

## **2.2 Identify, initiate, and prioritize systemic projects involving top-risk populations**

Preliminary analysis of linked health, crash, and death data stratified by race/ethnicity, sex, age, and country of origin show overrepresentation of people of color, immigrants, males, and older adults in serious crashes. Addressing these inequities requires a direct approach. Investigation into structural, economic, and social factors that contribute to inequitable outcomes in crash injuries and deaths can provide a better understanding of critical transportation safety issues, such as barriers to roadway safety education for young, novice, immigrant, and aging drivers; factors that contribute to poor sleep habits; and social norms like impaired driving and seatbelt use, and guide more effective strategies to improve transportation safety.

## **2.3 Biannually update and disseminate information on locations and populations of top risk**

Updated data is crucial for implementing safety programming, as well as for increasing transparency and engagement to prioritize top-risk roadways and behaviors. Accordingly, the Commonwealth will provide updates every 2 years and disseminate the top-risk and top-crash frequency locations in Massachusetts via the IMPACT portal.<sup>24</sup> Partner organizations and communities can use this information as a starting point for developing projects to address high-priority locations. Linked health and crash data on demographic groups and geographic locations will be shared with traffic safety stakeholders and policy makers.

## **2.4 Evaluate effectiveness**

Determining whether an intervention is successful can only occur through evaluation. Evaluations will help SHSP partners determine the most effective interventions for mitigating top-risk locations and then replicate those successes. Effectiveness evaluations can also help to identify where interventions are not working well. In those cases, agencies can make changes or implement additional interventions as needed.

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<sup>24</sup> <https://apps.impact.dot.state.ma.us/cdp/home>





## Take an Active Role to Affect Change in Vehicle Design, Features, and Use

*Safe vehicles are a core component of a Safe System Approach, as vehicle sizes and designs affect the occurrence and severity of collisions.*

Cars are manufactured with the capability to reach speeds up to 212 mph—more than 3 times the highest speed limit in Massachusetts—and many vehicles sold in the U.S. can accelerate from 0 to 60 mph in under 3 seconds.<sup>25</sup> Further, vehicles weigh thousands of pounds and the average vehicle size has increased with more drivers choosing SUVs and pick-up trucks. **The Commonwealth should have an active role in expanding the availability of vehicle systems and features, restrict use of certain vehicles, and explore different options for expanding licensing types based on types of vehicles, to prevent and minimize the impacts of crashes.**

<sup>25</sup> <https://www.motortrend.com/features/fastest-cars-0-60-mph/>

According to the U.S. Department of Transportation, vehicle safety performance plays a key role in avoiding or mitigating the harm of crashes. As an example, seat belts and airbags prevented approximately 425,000 deaths in national traffic crashes since they were first required in 1968 and 1998, respectively. The newly Federally mandated advanced drunk and impaired driving prevention technology for vehicles is expected to annually save 9,400 lives across the U.S.<sup>26</sup> Employing safer vehicles also means utilizing strategies to improve the safety of commercial motor vehicles transporting goods and carrying thousands of passengers locally and across the country every day.

States mandating ignition interlocks for all drivers convicted of operating while alcohol-impaired experienced **15% fewer impaired driving crashes** resulting in death compared to states with no mandate.<sup>27</sup>

Ignition interlocks **decrease re-arrest rates** for alcohol-impaired driving by **67%.**<sup>28</sup>



### ***3.1 Identify opportunities for the state to champion safe vehicle designs and features to minimize injury severity with national, state, and local partners***

State agencies can evaluate opportunities for the Commonwealth to champion safer vehicles by procuring vehicles that optimize safety and support communities in the procurement of safer municipal vehicles, especially in the transition to EVs. It is imperative to participate in national conversations on vehicle design. Several states have begun to take initiatives regarding safer vehicle features and design, and it is important that Massachusetts does so as well. The Commonwealth will provide communities with relevant information related to vehicle design and safety. This includes information on how vehicle design standards impact the safety of those outside of motor vehicles, including pedestrians and bicyclists, with specific regard to vehicle size, speed, and weight. The Commonwealth will look for ways to incentivize purchasing smaller and safer vehicles equipped with important safety features.

26 <https://www.ihs.org/topics/bibliography/ref/2156>

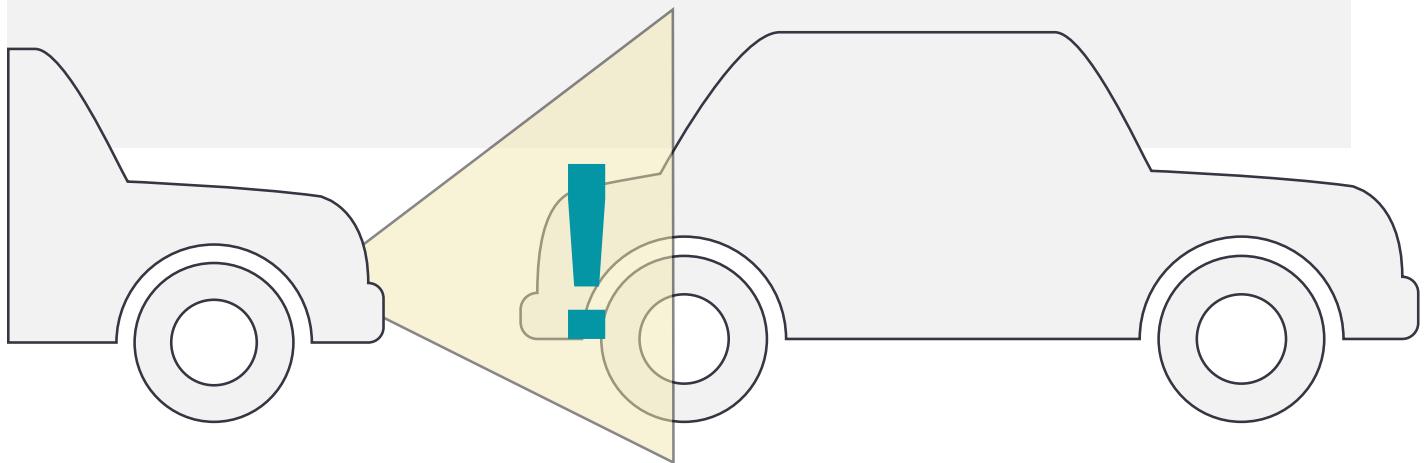
27 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4985097/>

28 [https://www.cdc.gov/media/releases/2011/p0222\\_ignitioninterlocks.html](https://www.cdc.gov/media/releases/2011/p0222_ignitioninterlocks.html)



Vehicles equipped with **automatic emergency braking** experience **50% fewer front-to-rear crashes** and **56% fewer front-to-rear crashes with injuries.**<sup>29</sup>

Vehicles with an **automatic emergency braking system with pedestrian detection** were involved in **27% fewer pedestrian crashes** and **30% fewer crashes resulting in a pedestrian injury.**<sup>30</sup>



29 <https://www.iihs.org/media/290e24fd-a8ab-4f07-9d92-737b909a4b5e/4GauQQ/Topics/ADVANCED%20DRIVER%20ASSISTANCE/IIHS-HLDI-CA-benefits.pdf>

30 <https://www.iihs.org/media/7560e1bf-fcc5-4540-aa16-07444f17d240/A25ptg/HLDI%20Research/Collisions%20avoidance%20features/35.34-compendium.pdf>





## Accelerate Research and Adoption of Technology

*Massachusetts has the potential to be at the forefront of research and the adoption of innovative safety technologies.*

The Commonwealth is eager to support research and the use of technologies to reduce roadway deaths and serious injuries. As part of this work, Massachusetts will identify barriers to adoption, as well as the statutory and regulatory changes needed.

#### **4.1 Pursue research to test new approaches and identify new technologies for improving safety - including methods to screen and curb dangerous behaviors (e.g., drug impairment levels, testing tools)**

The Safe System Approach recognizes that humans make mistakes. While Massachusetts will design and operate a transportation system that accommodates mistakes and injury tolerances, research is essential to discover and test new methods for improving safety. New behavioral research, including factors that contribute to high-risk behaviors and strategies to change behaviors may be especially useful. There are opportunities for technology and research to assist Massachusetts agencies in understanding how to engage and possibly prevent mistakes and unsafe behaviors from occurring. The technologies should extend to all aspects of the system including roadways, vehicles, users, data, connectivity, and more.

#### **4.2 Develop prospective pilots for automated enforcement for red light running, speed zones, and work zones**

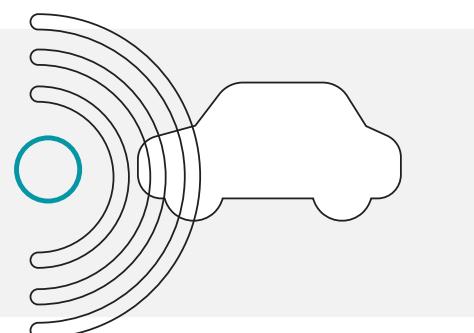
Automated enforcement is the use of cameras and radar technology to identify and cite vehicles for violating traffic laws such as speeding, running red lights, and bus and bicycle lane violations. Speed is a key factor in protecting all road users, including pedestrians and bicyclists. While automated enforcement is a proven tool for improving driving behaviors and reducing vehicle speeds in communities, it has not yet been utilized in Massachusetts. Currently, Massachusetts General Law does not permit the use of automated enforcement.

Twenty-three states allow for red light cameras,<sup>31</sup> and 17 states allow for speed cameras, many of which grant communities the ability to opt-in.<sup>32</sup> Over 400 U.S. communities use red light cameras and over 130 use cameras to enforce speed laws.<sup>33</sup>

In Maryland, a study showed that the proportion of drivers traveling more than 10 mph above the speed limit declined by nearly 70% for locations with warning signs and speed camera enforcement.<sup>34</sup>

With interest from communities throughout Massachusetts, the Commonwealth will work with municipal partners to develop prospective pilots to test technologies and develop recommendations for legislature approval. Importantly, it is essential that any automated enforcement pilot accounts for equity to prevent existing enforcement disparities or create new ones. Importantly, safety must remain the sole focus of any automated enforcement effort and must not be used as a source of revenue.

**Automated speed enforcement can reduce fatal and serious injury crashes by 11% to 44% and reduce the proportion of speeding drivers by 14% to 65%.<sup>35</sup>**



31 <https://www.ncsl.org/research/transportation/red-light-camera-traffic-enforcement.aspx>

32 <https://www.ncsl.org/research/transportation/enforcing-traffic-laws-with-red-light-and-speed-cameras.aspx>

33 [https://www.visionzerocoalition.org/state\\_legislation](https://www.visionzerocoalition.org/state_legislation)

34 <https://stopredlightrunning.com/pdfs/TO%20ADD%20Montgomery%20County%20Speed%20Study.08.pdf>

35 <https://www.cdc.gov/motorvehiclesafety/calculator/factsheet/speed.html>



#### **4.3 Expand data linkages to improve our understanding of risks related to serious crashes and opportunities for intervention**

Data is critical in helping state agencies determine what risks and vulnerabilities exist in the roadway system and which populations are most impacted. Strengthening and expanding data linkages across databases, as well as agencies and other organizations, will create a more complete picture of risks related to serious crashes. More research and analysis will support a better understanding across various unknown areas, potentially including the pandemic's effects on deaths and serious injuries. With this risk-based information, SHSP partners can then identify the most appropriate opportunities for intervention.

#### **4.4 Evaluate and identify how roadway safety-related violation structure incentivizes or disincentivizes dangerous driving behavior and develop recommendations for changes**

Penalties and consequences exist to deter unsafe roadway practices and behaviors. It may be beneficial to reevaluate how the safety-related violation structure currently serves the Commonwealth's needs and goals. Given changes to Massachusetts' roadway system and the adoption of the Safe System Approach, there is an opportunity to develop recommendations for change to ensure that the safety-related violation structure for roadways disincentivizes dangerous driving behavior and incentivizes responsible action and does so in an equitable manner.

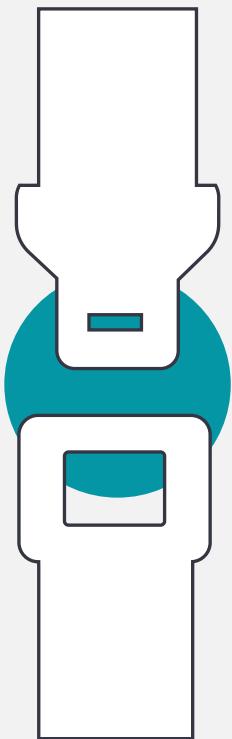




## Double Down on What Works

*The Commonwealth will maintain existing initiatives that have proven effective, while also expanding them in new ways using the Safe System Approach.*

To achieve the vision zero goal, this SHSP encourages everyone to double down on what has already been shown to reduce roadway deaths and injuries, increasing safety for all. Using the SHSP as a framework, the Commonwealth will continue to monitor the effectiveness of these strategies and identify ways to improve or revise them as needed.



**Lap and shoulder combination seat belts**, when used, reduce the risk of death to front-seat passenger car occupants by 45% and the risk of moderate-to-critical injury by 50%. For light truck occupants, seat belts reduce the risk of death by 60% and moderate-to-critical injury by 65%.

**Child restraints** reduce deaths by 71% for infants younger than one years old and 54% for children one to four years old in passenger cars. In light trucks, the fatality reductions are 58% for infants and 59% for children one to four years old.<sup>36</sup>

**Belt-positioning booster seats** reduce the risk of injury to children four to eight years in crashes by 45% when compared to the effectiveness of seat belts alone.<sup>37</sup>

## 5.1 Address top crash locations

Commonwealth agencies have been working to address top crash locations which present known areas of concern. Through data analysis and evaluation, state agencies and partners are pursuing multifaceted approaches to mitigate safety concerns and prevent serious injuries and deaths. This includes engineering, communications, enforcement, public health, and other outreach methods and programs. The Commonwealth will focus on the 68% of the top 200 statewide intersection crash locations that fall within Environmental Justice areas. An additional focus will be on the 71% of top pedestrian crash locations that fall within Environmental Justice areas. Past examples include Kelley Square in Worcester, once the top crash location in the state, which went through a full redesign. Preliminary data indicates that the number of crashes and injuries in Kelley Square decreased to approximately half of what they were before the safety improvements were implemented (even when vehicle miles traveled increased), while crashes and injuries elsewhere in Worcester only dropped by 17%.

## 5.2 Expand the use of roadway pilots

Massachusetts has been at the forefront of pilots for testing treatments, many of which have become adopted as proven safety countermeasures that can now be widely implemented. Massachusetts will continue to identify and implement pilots to test new ideas. For pilot concepts that have proven successful, the Commonwealth will focus on widespread adoption, while also supporting communities to test and pilot innovations in treatments.

36 <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812369.pdf>

37 <https://www.sciencedirect.com/science/article/abs/pii/S0022437505000241>



### **5.3 Expand internal state workforce training to engage the state workforce to raise awareness about the Safe System Approach and educate/train on how to implement it in their work**

The Commonwealth currently provides training on the SHSP's mission of making safety a top priority. It is essential that Massachusetts continues training workforces while also expanding these trainings to discuss the Safe System Approach and ways they can contribute to safety through their work responsibilities. As part of this work, the effectiveness of these trainings will be evaluated.

### **5.4 Expand external trainings the state provides to amplify safety, Safe System, and best practices**

It will be essential to utilize existing forums, as well as create new ones, to share what the Safe System Approach looks like in practice, while also offering training to transportation professionals, engineers, and judicial and enforcement communities. Currently, the Commonwealth provides training through the Bay State Roads program and a variety of agencies including the Department of Public Health, EOPSS Office of Grants and Research, Highway Safety Division, and Massachusetts State Police.

### **5.5 Expand resources to municipalities**

There are many ways the Commonwealth provides resources to communities to support local safety work by providing grants such as Shared Streets & Spaces and providing items such as signage, variable message boards, speed feedback signs, radar/LIDAR, sidewalk snow removal equipment, and other equipment and materials. The Commonwealth will partner with communities to identify which continued resources are helpful and expand resources to include additional materials to address deaths on Massachusetts roadways. The method and means to provide these resources will be revisited to do so in an effective and equitable manner to reduce deaths and serious injuries.

### **5.6 Get more safety equipment into the hands of road users (e.g., bicycle lights, car seats)**

State agencies will increase the use of existing programs and develop new methods to distribute safety equipment to road users, particularly underserved and vulnerable communities, and road user types where data shows inequitable crash rates. Because underserved populations are often those most impacted by roadway deaths and serious injuries, providing these groups with bicycle lights, car seats, and other potentially life-saving equipment can assist in developing a stronger road safety culture, spreading safety awareness, and saving lives.

### **5.7 Expand data-driven targeted enforcement and high visibility police presence**

Targeted enforcement (including OUI checkpoints, police presence at top-risk and crash locations, work zones, and other areas) plays a role in improving roadway safety, especially when automated enforcement is not available due to Massachusetts General Law. The Commonwealth will work to define needs and identify what data should be used to support enforcement and deter unsafe behavior. The Commonwealth will work to incorporate community engagement best practices to ensure the equitable adoption and implementation of enforcement.



## **5.8 Improve accessibility and linkage of relevant safety-related data to professionals and the public**

The public, as well as professionals outside of state agencies, can use safety data to uncover much-needed insights and opportunities. It is important to expand and improve the accessibility and linkage of safety data sources to improve work toward the Commonwealth's safety goals.

## **5.9 Increase maintenance and operations**

The day-to-day work of keeping the Commonwealth's roadways in efficient working order cannot be overstated. Here, maintenance and operations refer to critical activities such as monitoring the roadways, removing snow, trimming trees, and refreshing signage and markings—seemingly routine operational activities that ultimately play a huge role in ensuring safety and mobility for all.<sup>38</sup> Just as important as providing alternative transportation methods (including public transit) is improving access to the walkways and roadway services already in place. While constructing a new sidewalk to allow pedestrians and bicyclists to reach new locations is helpful, these benefits disappear when this sidewalk is not cleared after heavy snowfall. While some individuals can continue to walk along an icy path or choose another form of transportation, those with limited mobility options will face a difficult and treacherous journey or will be unable to reach their destination. Visual challenges faced by older drivers must be addressed, particularly when signs and markings are not well maintained. Maintaining sign retro-reflectivity and marking visibility helps not only older drivers but all road users. Equity and accessibility are important reasons why the Commonwealth must implement effective and broad maintenance plans across a wide swath of roadways and activity types. The Commonwealth can redouble its efforts here to prioritize and expand important maintenance activities in service of safety.

## **5.10 Increase Road Safety Audits**

A Road Safety Audit (RSA) is a formal safety review of an existing or planned roadway or intersection. The use of RSAs to inform projects has been shown to reduce crashes by between 10 and 60%.<sup>39</sup> During an audit, an independent, multidisciplinary team (consisting of engineers, planners, various emergency responders, advocates, and others) identifies potential safety issues and opportunities for safety improvements. The Commonwealth's RSA program is an important part of the HSIP and has expanded to include additional high-crash locations and individual crash types, such as pedestrian and bicycle hot spots. The RSA program should be emphasized, particularly in areas where equity concerns are present. These expansions can assist the Commonwealth in better identifying and improving problem areas on Massachusetts roadways.

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38 [https://safety.fhwa.dot.gov/local\\_rural/training/fhwasa07018/](https://safety.fhwa.dot.gov/local_rural/training/fhwasa07018/)

39 <https://rosap.ntl.bts.gov/view/dot/29457>



## **5.11 Provide a safe work environment for workers on roadways through increased training, education, awareness of incident management, and cutting-edge approaches**

As roadway workers are essential to making all travel possible, they should be ensured a safe work environment. In recent years, the work of the Traffic Incident Management Task Force, in addition to the implementation of Move Over laws and other initiatives, has created a focus on roadway worker safety. The Commonwealth plans to further improve roadway worker safety through increased training, education, awareness of incident management, and other new approaches.

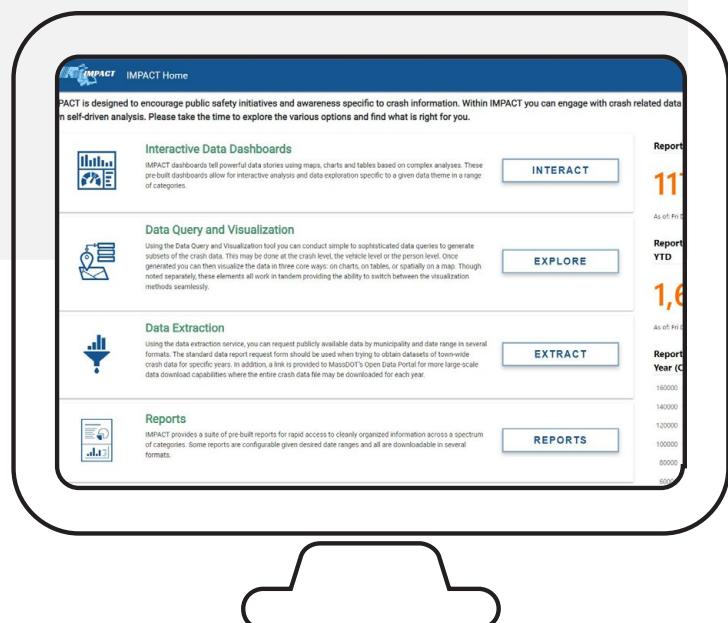
## **5.12 Implement proven safety countermeasures in all roadway projects**

Moving beyond research and pilots, it is important to routinely implement proven safety countermeasures by utilizing NHTSA's Countermeasures that Work,<sup>40</sup> and FHWA's Proven Safety Countermeasures,<sup>41</sup> as well as other similar resources. As part of the implementation, communications and training will be critical for widespread adoption and community support.

## **5.13 Develop, utilize, and provide guidance resources for effective selection and evaluation of improvements under both state and local jurisdictions**

The safety analysis tools and, specifically, the network screening tools in IMPACT<sup>42</sup> can assist with project selection. Selecting the most effective options can be done through several available sources including Intersection Control Evaluations (ICE), Safety Alternatives Analysis Guide, and the soon-to-be-updated Project Development and Design Guide.

MassDOT's IMPACT site offers safety analysis and network screening tools to assist with project selection.



40 [https://www.nhtsa.gov/sites/nhtsa.gov/files/2021-09/Countermeasures-10th\\_080621\\_v5\\_tag.pdf](https://www.nhtsa.gov/sites/nhtsa.gov/files/2021-09/Countermeasures-10th_080621_v5_tag.pdf)

41 <https://safety.fhwa.dot.gov/provencountermeasures/index.cfm>

42 <https://apps.impact.dot.state.ma.us/cdp/home>



## **5.14 Improve post-crash care through improving cell service coverage, implementing new trauma triage guidelines, increasing services for those involved in crashes, and increasing data linkages**

*Immediate access  
to emergency  
medical services is  
critical to preventing  
deaths from medical  
emergencies*

**Emergency Medical Response:** Immediate access to emergency medical services is critical to preventing deaths from medical emergencies. The sooner first responders can reach a person in crisis, the sooner they can provide needed care and transportation, and the better the outcome for the patient.<sup>43,44</sup> In particular, using a cell phone to call for emergency services during a medical crisis can facilitate this process, leading to shorter response times and improved outcomes. This is particularly relevant to motor vehicle crashes involving older children. In Massachusetts, occupant injury deaths occurred at a rate of 2.29 deaths per 100,000 population for the ages between 15 and 17 from 2018-2020. Meanwhile, cell phone service found that “zero coverage areas are prevalent across the Berkshire and Pioneer Valley regions.”<sup>45,46</sup> In subsequent years, coverage has improved but remains unreliable in many places. This issue could be remedied by improving cell coverage in underserved areas, with a focus on the Commonwealth’s roads due to challenges faced by those involved in car crashes in rural areas. The Massachusetts State Child Fatality Review team issued a recommendation related to cellphone coverage in their FY21 Annual Report.<sup>46</sup>

Regarding field triage and treatment, the Office of Emergency Medical Services (OEMS) and its advisory bodies, in concordance with Federal implementation, will incorporate the newly revised trauma triage guidelines from the American College of Surgeons’ Committee on Trauma. The intent is to improve the classification of patient injury in the field to allow transport to the most appropriate treatment facility. The use of tranexamic acid therapy to reduce field hemorrhage has been incorporated into the Statewide EMS Treatment Protocols, and indications for its use will be adjusted based on evidence from medical literature. Blood transfusion therapy has been added to field treatment by critical care services within the past 2 years as well.

43 [https://link.springer.com/referenceworkentry/10.1007/978-1-4020-5614-7\\_2762](https://link.springer.com/referenceworkentry/10.1007/978-1-4020-5614-7_2762)

44 <https://pubmed.ncbi.nlm.nih.gov/25627482/>

45 <https://pubmed.ncbi.nlm.nih.gov/18325208/>

46 <https://www.mass.gov/doc/fy21-child-fatality-review-annual-report/download>



*Post-crash in-hospital care is an important opportunity to screen, intervene, and refer people to services, especially if they were intoxicated at the time of the crash.*

*CRISS data found that 1 in 4 hospitalized drivers were involved in a prior "at-fault" crash.*

### **Bedside Screening, Brief Intervention, and Referral to Treatment Services:**

According to a recent analysis of 2016-2018 Massachusetts Department of Public Health's Crash Related Injury Surveillance System (MA CRISS) data, healthcare providers identified 24% of hospitalized car/truck drivers as intoxicated on alcohol or drugs at the time of the crash, which was more than twice that documented in crash reports for these drivers (10%).<sup>47</sup> Post-crash in-hospital care is an important opportunity to screen, intervene, and refer people to services, especially if they were intoxicated at the time of the crash. Screening, Brief Intervention, and Referral to Treatment (SBIRT) is an evidence-based public health strategy to identify and address unhealthy substance use and has been associated with decreases in substance use.<sup>48</sup> SBIRT in emergency department settings can assist with both substance use disorder and facilitate connection with appropriate substance use treatment services. It can also facilitate brief intervention conversations that can motivate change in those that do not have a substance use disorder (i.e. address an injury related to an acute intoxication). Using principles of motivational interviewing can also assist in the facilitation of a guided change of any behavior that can support health and safety.

Boston Medical Center and other level 1 trauma centers currently leverage Medical Fitness Reporting. Under the Safe Driving Law Legislation (2010), medical providers are allowed to alert the Registry of Motor Vehicles when a health care provider has determined that a driver's capacity to operate a motor vehicle safely is cognitively or physically impaired, including due to substances. Recruiting additional hospitals to conduct that protocol in the post-crash care environment could prevent subsequent crashes.

**Data linkage:** Linked traffic records systems can be used to improve our understanding of the causes of crashes and ways to prevent future crashes. MA CRISS currently links crash, injury surveillance, and driver records data and aims to link additional data sources in the future.<sup>49</sup> Analysis of MA CRISS data found that 1 in 4 hospitalized drivers were involved in a prior "at-fault" crash, and 1 in 10 were involved as a driver in a subsequent crash in which they or someone else was injured. On average, these subsequent injury crashes occurred about 2 years after the first crash. Linked traffic records that include post-crash injury surveillance data can be used to identify health-related risk factors, such as intoxication, acute medical events, and chronic health problems, which may contribute to crashes and put drivers at risk for future crashes.

47 <https://www.mass.gov/injury-surveillance-program>

48 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5841453/>

49 <https://www.mass.gov/injury-surveillance-program>





## Implement New Approaches to Public Education and Awareness

*Shared responsibility is one of the six principles of the Safe System Approach—this includes the public.*

Engaging the public to involve everyone in roadway safety is necessary for creating a truly safe transportation network. **Individuals make choices every day that impact their own safety and the safety of everyone around them.** Whether it is buckling the seatbelt, obeying the speed limit, or stopping for people seeking to cross a street, each person affects roadway safety in the Commonwealth.

New approaches for public engagement need to be developed and tested for effectiveness. For education and awareness to be most effective, they must be developed and launched as key components of the larger multi-faceted plan, with active engagement with the affected communities to determine barriers and strategies. The 2023 SHSP aims to expand education and awareness of roadway safety by analyzing data for specific safety issues as well as the demographics affecting safety in the Commonwealth. This targeted, integrated approach will positively affect safety behavior.

### ***6.1 Develop new approaches, test to find what works, and implement a new type of comprehensive campaign that will have an impact on social norming/behavioral change on speeding, occupant protection, impairment, distraction, and seatbelts***

While many factors contribute to roadway crashes, several persistent factors underscore a large portion of roadway deaths and serious injuries. These factors include speeding, occupant protection, impairment, distraction, vehicle size, and seatbelt usage. The Commonwealth aims to change behavior and shift the social norm of what is acceptable. Thus, the 2023 SHSP identifies a need to develop, test, and implement new types of comprehensive campaigns that can truly impact public awareness and behavior to achieve safer roadways. This effort will include looking into a variety of different touchpoints to effectively disseminate safety information to various communities with awareness of how the pandemic may or may not have impacted behavioral and mental health.

### ***6.2 Develop an educational opportunity when individuals interact with the Registry of Motor Vehicles (RMV) to renew or obtain a license or ID so they can learn about safety advances including roadway design, multimodal mobility, signs, and signals***

Driver license renewals present an opportunity for the Commonwealth to inform, educate, or refresh drivers on new and existing developments that impact roadway safety. After initial licensing, license renewal may be one of the few structured ways to inform drivers on safety best practices. License renewals present a touch point to provide education regarding advances in roadway design, multimodal mobility, signs, and signals. Additionally, issuance and renewal of non-driving Mass IDs provides an opportunity to educate pedestrians and cyclists on best practices for navigating Massachusetts roadways.

### ***6.3 Improve driver education and training for those under 18 and expand driver education for parent(s)/guardian(s) of those new drivers***

Young drivers are increasingly at risk of being killed or seriously injured in a crash. As inexperienced drivers, they are more vulnerable to hazards on the roads since they are still developing their driving skills. State agencies need to improve driver education and training for individuals under the age of 18 to better prepare them for real world driving scenarios and to instill within all drivers an appreciation for the responsibility they must share the road with non-motorized users. Youth also need to be engaged in the development of programs. As a complementary effort, expanding driver education for the parents/guardians may help to provide another way to reinforce the importance of safe driving behaviors for both young drivers. This can also assist in honing the driving skills of the parents/guardians by teaching them about the latest technologies, infrastructure, laws, and safety elements.



Young drivers who have **not completed driver's education** are **75%** more likely to get a **traffic ticket**, **24%** more likely to be **killed or injured in a crash**, and **16%** more likely to be **involved in a crash**.<sup>50</sup>

**Stronger nighttime restrictions for young drivers** were associated with **greater crash reductions**. These reductions were greater when associated with laws limiting teenage passengers to zero or one, in contrast to laws allowing two or more teenage passengers, or laws with no passenger restrictions.<sup>51</sup>

**MASSACHUSETTS**  
**Junior Operator**  
**License**



#### **6.4 Improve driver education for new drivers over 18 years of age and provide refreshers for drivers transferring a license from another state**

Regardless of age, being a new driver involves navigating new situations and developing driving awareness and skills. By adding driver education for new drivers over 18 years of age, new drivers, and drivers from other states and countries may become better equipped and feel more comfortable navigating roadways safely. Currently, new drivers and drivers from other countries over the age of 18 are not required to take driver education. Additionally, laws differ from state to state, and further research is needed to understand the best way to educate a driver on laws specific to Massachusetts when transferring the driver's license from another state to becoming licensed in Massachusetts. Methods for subsidizing driver education for low-income populations should also be explored.

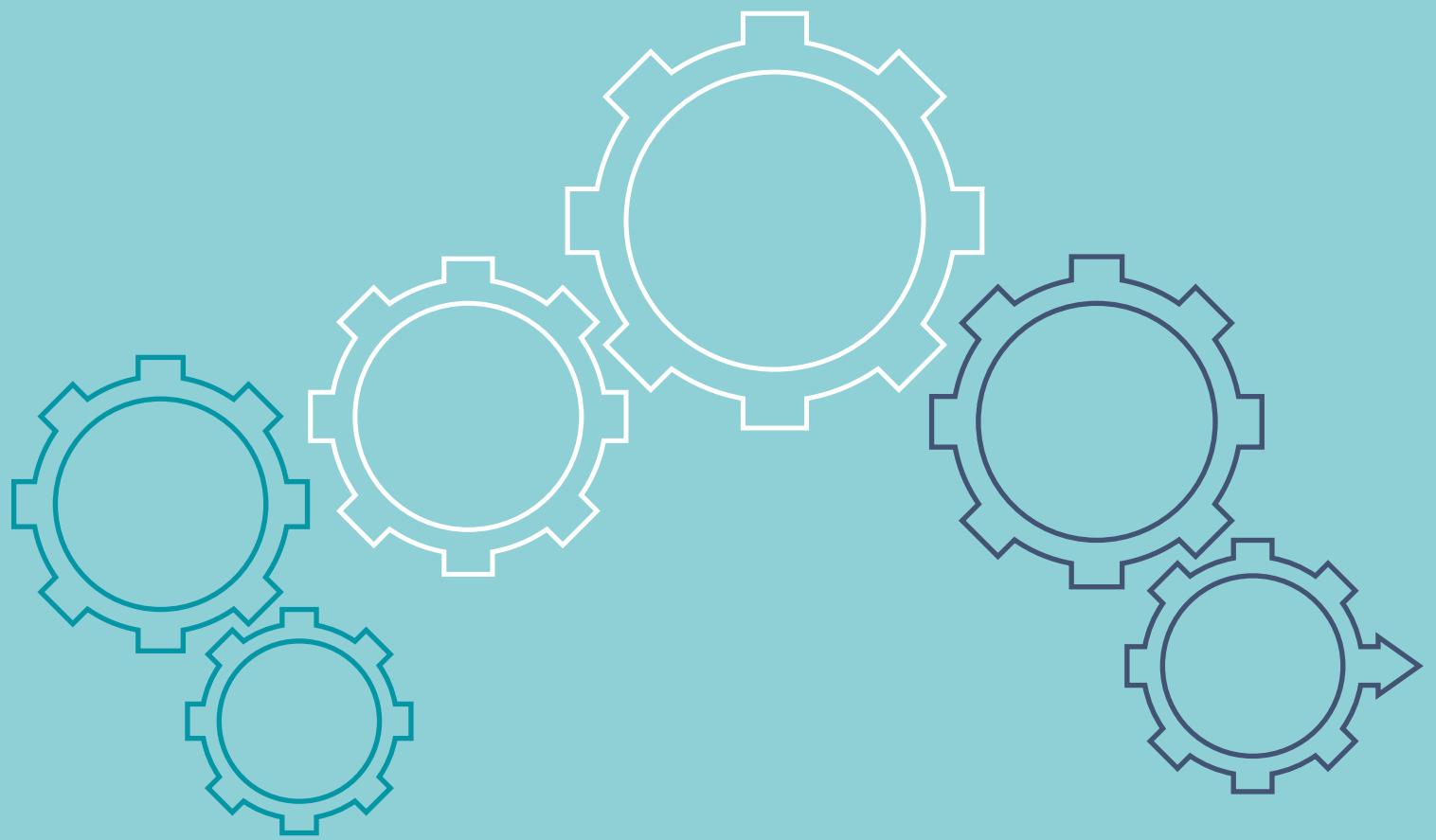
#### **6.5 Establish a state plan to communicate safety - including how we want media to talk about crashes**

Communication and the ways safety is framed are the foundation of how the public views crashes. The Commonwealth will establish a state communications plan for safety on how data is reported to change public reporting and media. The communication plan will make efforts to convey the systemic nature of roadway crashes and traffic deaths instead of portraying them as single, unrelated incidents.

50 <https://pubmed.ncbi.nlm.nih.gov/26043429/>

51 <https://www.ihs.org/topics/bibliography/ref/1882>





*Together we can  
develop a Safe  
System with zero  
deaths and serious  
injuries on our  
roadways.*



# 3

## PLANNING TO ACTION

*The SHSP lays out the framework for the development of the detailed action plan. Due to the urgent need to stem this tide of increasing deaths, the next step will be developing a detailed action plan to define the concrete tasks on how the Commonwealth will achieve each of the six initiatives.*

*There will be coordination with partners between state agencies, regions, municipalities and community groups, and others as each will have an essential responsibility in accomplishing the Safe System Approach. Ownership will be established to lead the detailed actions, performance measures will be developed to track progress, deadlines will be established to ensure timeliness, and resource and staffing needs will be identified to ensure implementation.*



For more information and updates, check out:  
<https://www.mass.gov/service-details/strategic-highway-safety-plan>