



Massachusetts Strategic Highway Safety Plan



September 2013



Message from Richard A. Davey, Secretary and Chief Executive Officer, Massachusetts Department of Transportation

Fall 2013

Dear Massachusetts citizen:

In the years since the first Massachusetts Strategic Highway Safety Plan (SHSP) was prepared in 2006, Massachusetts experienced a steady decline in the number of traffic-related crashes throughout the Commonwealth. Comparing the five-year averages from SHSP implementation in 2006 (2002-2006) to current (2007-2011), fatalities dropped by 19 percent and serious injuries (hospital stays for nonfatal traffic injuries) also declined by 19 percent. That also is the same time period Massachusetts was implementing a comprehensive, multidisciplinary approach to improving safety on our roadways.

The 2006 Strategic Highway Safety Plan (SHSP) involved the 4 Es of safety to ensure all aspects of traffic safety from engineering, enforcement, education, and emergency response were fully committed to saving lives and mitigating injury due to traffic crashes. The numbers tell the story – these efforts made a difference.

To keep Massachusetts moving forward, safety stakeholders came together and completed an update of the SHSP to reflect new challenges in our State. Massachusetts, for instance, has been awarded one of two National Texting Ban Demonstration Enforcement grants from the National Highway Traffic Safety Administration (NHTSA) to test the success of enforcing distracted driving laws. What we learn will be used as the model for the rest of the nation in what many consider one of the most serious traffic safety problems facing the traveling public. These individuals, who donated their time and effort during meetings and at events, debated the merits of various approaches to safety to keep our citizens and visitors safe while driving, walking, and riding.

Now we face an even greater test – implementing this updated plan. Please join with the representatives of agencies, organizations, and companies which are committed to support and actively participate in the implementation of the SHSP, to stop the terrible human and economic devastation caused by traffic crashes. By following a few simple rules, hundreds of lives can be saved. Remember to always buckle up, slow down, drive sober, and pay attention to the driving task. We also can influence our friends, families, and colleagues to adopt these safe and sensible practices.

SHSP implementation can be one of our most important efforts in the months and years ahead. It is a difficult task that requires us to focus our efforts and ensure we wisely use limited resources where they will have the greatest impact on reducing traffic fatalities and serious injuries. We can, by once again working together, face our future boldly and keep the Commonwealth's roads and highways safe.

Richard A. Davey

Secretary and Chief Executive Officer, Massachusetts Department of Transportation

WINTER
WEATHER
ADVISORY

TRUCKS
PROHIBITED
FROM
LEFT LANE





Table of Contents

Executive Summary	1
Executive Leadership Committee and Steering Committee Members.....	2
Introduction and Background.....	3
The SHSP Update Process.....	4
Strategic Emphasis Area: Impaired Driving	7
Strategic Emphasis Area: Intersections	8
Strategic Emphasis Area: Lane Departures.....	9
Strategic Emphasis Area: Occupant Protection	10
Strategic Emphasis Area: Speeding and Aggressive Driving	11
Strategic Emphasis Area: Young Drivers.....	12
Strategic Emphasis Area: Older Drivers	13
Strategic Emphasis Area: Pedestrians.....	14
Strategic Emphasis Area: Motorcycles.....	15
Strategic Emphasis Area: Bicycles	16
Proactive Emphasis Area: Truck-Involved Crashes	17
Proactive Emphasis Area: At-Grade Crossings.....	18
Proactive Emphasis Area: Safety of Persons Working on Roadways.....	19
Emerging Emphasis Area: Data Systems	20
Emerging Emphasis Area: Driver Inattention	21
SHSP Implementation.....	22
Acronym List	23



List of Figures

Figure 1.	Number of Massachusetts Fatalities and Percentage of Fatalities Occurring on Rural Roads.....	3
Figure 2.	Total Massachusetts Hospitalizations and Stays from Crashes and Percentage of Serious Injuries Occurring on Rural Roads.....	3
Figure 3.	Massachusetts Fatality Goals	4
Figure 4.	Massachusetts Traffic-Related Hospitalization Goals.....	4
Figure 5.	Fatalities from Crashes Involving a Driver with a Blood-Alcohol Content Level of 0.08 or Greater	7
Figure 6.	Percent of all Fatalities from Crashes Involving a Driver with a Blood-Alcohol Content Level of 0.08 or Greater	7
Figure 7.	Fatalities/Incapacitating Injuries at Intersections	8
Figure 8.	Percent of All Fatalities/Incapacitating Injuries from Intersection Crashes.....	8
Figure 9.	Intersection Control Type at Intersections with Fatal and Incapacitating Injury Crashes, 2004 to 2010	8
Figure 10.	Fatalities/Incapacitating Injuries from Lane Departure Crashes.....	9
Figure 11.	Percent of All Fatalities/Incapacitating Injuries from Lane Departure Crashes	9
Figure 12.	Unrestrained Fatalities from Motor Vehicle Crashes.....	10
Figure 13.	Unrestrained Fatalities, As a Share of All Fatalities from Motor Vehicle Crashes.....	10
Figure 14.	Massachusetts and United States Observed Seat Belt Use Rate	10
Figure 15.	Massachusetts (Year 2012) and United States (Year 2011) Observed Seat Belt Use Rate by Gender.....	10
Figure 16.	Massachusetts (Year 2012) and United States (Year 2011) Observed Seat Belt Use Rate by Vehicle Type.....	10
Figure 17.	Fatalities from Crashes Involving Speed	11
Figure 18.	Percent of all Fatalities from Crashes Involving Speed	11
Figure 19.	Fatalities/Incapacitating Injuries Involving Young Drivers	12
Figure 20.	Percent of All Fatalities/Incapacitating Injuries Involving Young Drivers.....	12
Figure 21.	Drivers Aged 65 and Over in Fatal and Hospital Stay Crashes.....	13
Figure 22.	Drivers Aged 65 and Over, As a Share of All Drivers in Fatal and Hospital Stay Crashes.....	13
Figure 23.	Pedestrian Fatalities and Hospital Stays from Motor Vehicle Crashes	14
Figure 24.	Pedestrians, As a Share of All Fatalities and Hospital Stay from Motor Vehicle Crashes	14
Figure 25.	Motorcyclist Fatalities and Hospital Stays from Motor Vehicle Crashes.....	15
Figure 26.	Motorcyclists, As a Share of All Fatalities and Hospital Stays from Motor Vehicle Crashes	15
Figure 27.	Bicyclist Fatalities and Hospital Stays from Motor Vehicle Crashes	16
Figure 28.	Bicyclists, As a Share of All Fatalities and Hospital Stays from Motor Vehicle Crashes	16



Figure 29. Large Trucks Involved in Fatal/Incapacitating Injury Crashes.....	17
Figure 30. Large Trucks, As a Share of All Vehicles Involved in Fatal/Incapacitating Injury Crashes	17
Figure 31. CMV Driver Contributing Factors in Massachusetts Crashes, 2010 to 2011	17
Figure 32. Fatalities from Highway-Rail Grade Crossing Crashes	18
Figure 33. Nonfatal Injuries from Highway-Rail Grade Crossing Crashes.....	18
Figure 34. Fatalities from Roadway Work Zones in Massachusetts.....	19





Executive Summary

In 2006, Massachusetts presented the Strategic Highway Safety Plan (SHSP), a statewide, comprehensive safety plan that provided a coordinated framework for reducing fatalities and serious injuries on the State's surface transportation network. With input from Federal, state, local, and private sector safety stakeholders, six emphasis areas were identified for the 2006 plan. An emphasis area covers a contributing crash factor. It is important to note crashes nearly always involve more than a single contributing crash factor. In 2012, the State undertook a revision to expand and improve upon the significant accomplishments in traffic safety and reductions in fatalities and serious injuries Massachusetts has achieved since the plan was first developed. To simplify SHSP organization and direction, safety stakeholders grouped the emphasis areas into three tiers to focus attention on the traffic safety problems exhibited by each area. These three tiers are labeled, Strategic, Proactive, and Emerging. A **Strategic** emphasis area is one that represents at least 10 percent of annual fatalities or severe injuries on Massachusetts roadways. The nine emphasis areas in this Tier are Impaired Driving, Intersections, Lane Departures, Occupant Protection, Speeding/Aggressive Driving, Young Drivers, Older Drivers, Pedestrians, and Motorcycles. A **Proactive** emphasis area is one that represents less than 10 percent of annual fatalities or severe injuries. The four areas are Bicycles, Truck/Bus-Involved Crashes, At-Grade Crossings, and Safety of Persons Working on Roadways. In these areas, the focus is to further reduce the already low number of fatalities and incapacitating injuries. **Emerging** emphasis areas focus on continuously improving the data systems used to analyze traffic safety patterns and generate data on safety topics where the data currently are inconclusive. These areas include Data Systems and Driver Inattention.

The updated Massachusetts SHSP is consistent with requirements outlined in the most recent Federal transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21). One requirement is to establish goals and performance measures. Goals in the Massachusetts SHSP include:

- Reduce motor vehicle fatalities and hospitalizations by 20 percent in the five-year period following adoption of the SHSP (Short-Term Goal);
- Halve the number of fatalities and serious injuries by 2030 (Interim Goal); and
- Move **Toward Zero Deaths** and eliminate fatalities and serious injuries on the roadways (Long-Term Goal).

The SHSP update process began with an in-depth analysis of available data followed by a meeting of the Executive Leadership Committee (ELC) to discuss the challenges and opportunities associated with previous and current SHSP experiences. Over several months, members of the ELC were interviewed to identify promising SHSP support strategies the agencies are implementing or plan to implement in the future. The 2006 SHSP, crash and other safety data, and interview results provided the foundation for the SHSP update process.

Once the foundation was established, SHSP organizers reached out to a representative multidisciplinary group of safety stakeholders to gain additional input, generate enthusiasm, build a statewide network to support road safety initiatives, and identify volunteers to serve on the Steering Committee. The Steering Committee members represent key agencies and are responsible for reviewing the progress of strategies within each emphasis area. Each emphasis area was assigned to the agency responsible for monitoring the implementation of strategies, and to track progress against objectives and strategies. The plan includes a summary for each emphasis area, i.e., a description of the issue, some of the key data, the objectives, and the strategies.



Executive Leadership Committee and Steering Committee Members

MASSACHUSETTS SHSP EXECUTIVE LEADERSHIP COMMITTEE

Executive Office of Public Safety and Security,
Highway Safety Division, Ellen Frank
Federal Highway Administration, Pam Stephenson
Federal Motor Carrier Safety Administration, Rich Bates
Massachusetts Association of Regional Planning Agencies,
Tim Brennan
Massachusetts Chiefs of Police Association,
Chief Wayne Sampson
Massachusetts Department of Public Health, Cheryl Bartlett

Massachusetts Department of Transportation,
Highway Division, Patricia Leavenworth
Massachusetts Department of Transportation,
Planning Division, David Mohler
Massachusetts Department of Transportation,
Registry of Motor Vehicles, Rachel Kaprielian
Massachusetts State Fire Marshal, Stephen Coan
Massachusetts State Police, Col. Tim Alben
National Highway Traffic Safety Administration, Mike Geraci

MASSACHUSETTS SHSP STEERING COMMITTEE

Executive Office of Public Safety and Security,
Highway Safety Division, Caroline Hymoff
Executive Office of Public Safety and Security,
Highway Safety Division, Barbara Rizzuti
Federal Highway Administration, Paul Maloney
Federal Highway Administration, Kenneth Miller
Federal Highway Administration, Promise Otaluka
Federal Motor Carrier Safety Administration, Matt Poirier
Littleton Fire Rescue, Steve Carter
Massachusetts Bay Transportation Authority, Timothy Davis
Massachusetts Bay Transportation Authority, Ronald Nickle
Massachusetts Department of Public Health,
Dr. Madeleine Biondolillo
Massachusetts Department of Public Health, Letitia Davis
Massachusetts Department of Public Health, Ridgely Ficks
Massachusetts Department of Public Health, Colleen McGuire
Massachusetts Department of Public Health, Rose Nash
Massachusetts Department of Public Health, Jerry O'Keefe
Massachusetts Department of Public Health, Jamie Pianka
Massachusetts Department of Public Health, Iyah Romm
Massachusetts Department of Transportation, Celia Blue
Massachusetts Department of Transportation and
Massachusetts Bay Transportation Authority, Director of
Security and Emergency Management, Randy Clarke
Massachusetts Department of Transportation,
Highway Division, Neil Boudreau
Massachusetts Department of Transportation,
Highway Division, James Danila
Massachusetts Department of Transportation,
Highway Division, Bonnie Polin

Massachusetts Department of Transportation,
Office of Performance Management, Paul Fernandes
Massachusetts Department of Transportation,
Planning Division, Bob Frey
Massachusetts Department of Transportation,
Planning Division, Josh Lehman
Massachusetts Department of Transportation,
Planning Division, Steve Woelfel
Massachusetts Department of Transportation,
Registry of Motor Vehicles, Eugene Carabine
Massachusetts Department of Transportation,
Registry of Motor Vehicles, Erin Deveney
Massachusetts Department of Transportation,
Registry of Motor Vehicles, Michele Ellicks
Massachusetts Department of Transportation,
Transit and Rail Division, Tim Doherty
Massachusetts Department of Transportation,
Transit and Rail Division, John Ray
Massachusetts District Attorneys Association, Andrea Nardone
Massachusetts Highway Association, Steven Tyler
Massachusetts Municipal Association, Tom Philbin
Massachusetts State Police, Lt. Col. Edward Amodeo
Massachusetts State Police, Lt. Thomas Fitzgerald
Massachusetts State Police, Lt. Daniel Griffin
Massachusetts State Police, Cpt. Steven McCarthy
Municipal Police Training Committee, Daniel Zivkovich
National Highway Traffic Safety Administration,
Paul Logozzo
National Highway Traffic Safety Administration,
Charlene Oakley



Introduction and Background

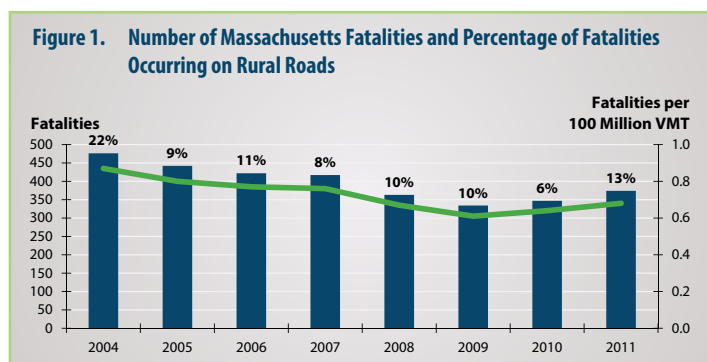
The safety strategic planning effort began in 1997 when the American Association of State Highway Transportation Officials (AASHTO) published a national Strategic Highway Safety Plan (SHSP) that took aim at significant highway safety challenges through the implementation of strategies targeting specific problems. All states were encouraged to develop similar plans, a goal furthered by passage of Federal legislation which required each state to develop an SHSP. The new Federal transportation legislation MAP-21 strengthens these provisions and requires states to update SHSPs on a regular basis along with requirements for performance standards to measure progress.

The Massachusetts SHSP developed in consultation with Federal, state, regional, local, and private sector safety stakeholders, used a data-driven, multidisciplinary approach involving the 4 Es of safety (e.g., engineering, education, enforcement, and emergency response) to identify the plan's statewide goals, objectives, and emphasis areas. Emphasis areas are organized by tiers to focus attention on the traffic safety problems exhibited by each area. These three tiers are labeled, Strategic, Proactive, and Emerging. A Strategic emphasis area is one that represents at least 10 percent of annual fatalities or severe injuries on Massachusetts roadways. The nine emphasis areas are Impaired Driving, Intersections, Lane Departures, Occupant Protection, Speeding/Aggressive Driving, Young Drivers, Older Drivers, Pedestrians, and Motorcycles. A Proactive emphasis area is one that represents less than 10 percent of annual fatalities or severe injuries. In these areas, the focus is to further reduce the already low number of fatalities and incapacitating injuries. The four proactive emphasis areas are Bicycles, Truck/Bus-Involved Crashes, At-Grade Crossings, and Safety of Persons Working on Roadways. Emerging emphasis areas include Data Systems and Driver Inattention. These emphasis areas focus on improving the data systems used to analyze traffic safety patterns and for safety topics where current data is inconclusive.

Since 2006, the SHSP has helped Massachusetts achieve significant improvements in traffic safety with reductions in the number of highway fatalities and serious injuries (hospital stays for nonfatal traffic injuries). Many strategies in the 2006 plan were fully implemented, including the establishment of a Junior Operator Law (effective January 2007), a Move Over Law (effective March 2009), and a Safe Driving Law (effective September 2010). Figure 1 shows the decline in traffic fatalities from 2006 and 2011 and Figure 2 shows the decrease for serious injuries.

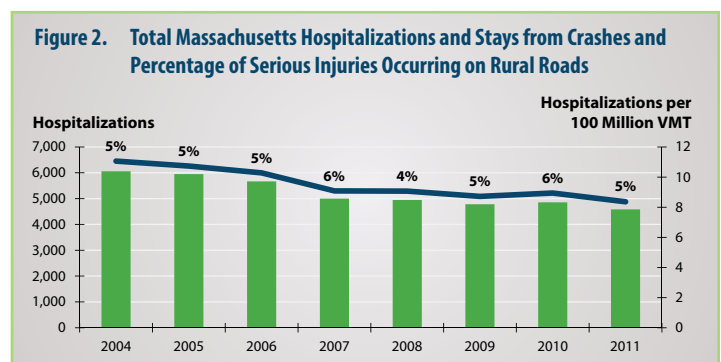
In 2012, Massachusetts embarked on an update of the 2006 SHSP by reaching out and engaging multidisciplinary safety stakeholders, reviewing available data, and developing new strategies to continue the Commonwealth's progress on traffic safety. The SHSP Update provides a definition for High-Risk Rural Roads (HRRR) in Massachusetts. A rural major or minor collector road or a rural local road is designated a HRRR if the facility exhibits a higher than average crash rate compared to facilities of the same type. Strategies and actions in the SHSP, where appropriate, will consider factors affecting these facilities.

AN UPDATED VISION



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

Note: Percentages indicate percent of fatalities occurring on rural roads.



Source: Hospitalization data from Massachusetts Hospital Inpatient Discharge Database and Massachusetts Outpatient Observation Stay Database, Massachusetts Center for Health Information and Analysis. Rural serious injury data from Massachusetts Crash Data System.

Note: Data are for non-fatal cases only (deaths that occurred following hospitalization were excluded). Percentages indicate percent of serious injuries occurring on rural roads.



The SHSP Update Process

Massachusetts adopted both a short-term (five years, 2013-2017) goal to reduce fatalities and hospitalizations by 20 percent by 2017, which provides a benchmark for progress, and an interim goal which recognizes the 2007 AASHTO goal of reducing the number of fatalities and serious injuries by one-half over two decades. The short-term goal is to reduce the five-year average fatalities from 367 to 294 and five-year average hospitalizations from 4,834 to 3,867 by 2017. Figures 3 and 4 show the future trends for achieving fatality and serious injury (hospitalization) short-term goals. To evaluate progress, the plan sets a baseline based on a five-year average of data from 2007-2011, which is the last year with complete and verified fatality and hospitalization data.

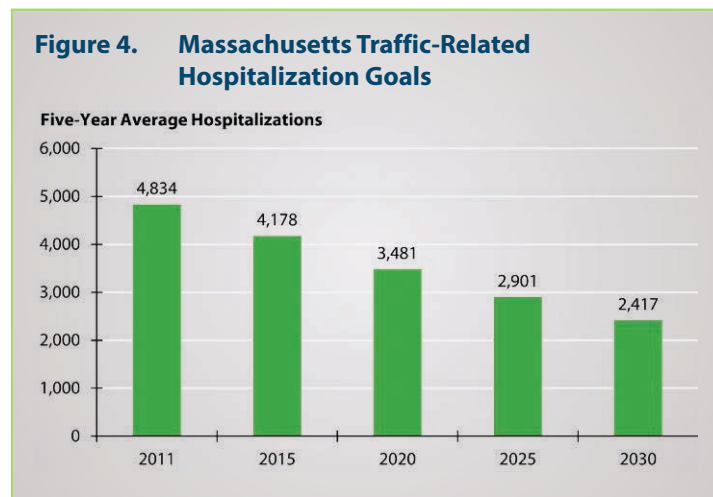
UPDATE APPROACH

Figure 3. Massachusetts Fatality Goals



Source: Massachusetts Department of Transportation.

Figure 4. Massachusetts Traffic-Related Hospitalization Goals



Source: Massachusetts Hospital Inpatient Discharge Database and Massachusetts Outpatient Observation Stay Database, Massachusetts Center for Health Information and Analysis.

Note: Observation stays are excluded; Data are for non-fatal cases only (deaths that occurred following hospitalization were excluded).

The update of the plan involved several tasks:

Identify stakeholders to participate in the SHSP update process and enhance collaboration across public and private organizations.

An important step in the update process was to engage stakeholders from across Massachusetts. Volunteers who participated in the 2006 SHSP development process along with new stakeholders identified by safety leaders in the State participated in the update process by offering their views on the strategies and future action steps in the plan along with recommendations on short-term and interim goals.

Recruit stakeholders to participate in Executive Leadership Committee, Steering Committee, and Emphasis Area Teams.

A series of interviews were held with members of the Executive Leadership Committee (ELC), made up of traffic safety leaders from a wide cross section of agencies to determine safety needs in the State and to confirm their participation. The ELC's role is to provide oversight and review progress on implementing the updated plan. Each ELC agency/organization also identified



staff to serve on the SHSP Steering Committee, which has primary responsibility for the day-to-day implementation of the plan. Members of the Steering Committee, other staff from participating agencies, and stakeholder volunteers also serve as members of the various emphasis area teams, which are responsible for implementing the plan's strategies and achieving emphasis area goals.

Conduct stakeholder meetings.

Joint Executive Leadership Committee/Steering Committee meetings were held in July 2012 and April 2013 to review SHSP drafts based on an examination of the 2006 SHSP, a careful review of the data, and input from ELC interviews and meetings. Stakeholders provided feedback in October 2012 and May 2013 and will take active roles in developing action plans for each emphasis area. The Emphasis Area teams met during August 2013 and early September 2013 to review and update the strategies and actions, ensure each is supported by at least one agency or organization, develop performance measures, and finalize the emphasis area plans.

Complete evaluations of transportation safety, crash data, and emphasis area strategies.

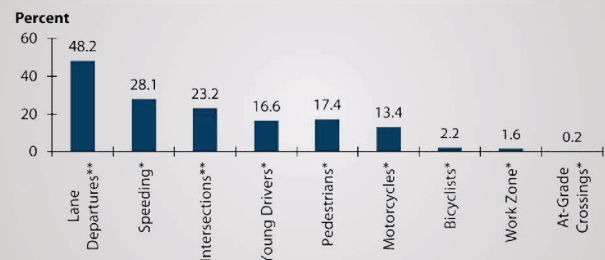
As the plan moves forward, each emphasis area will track performance measures in addition to the fatality and serious injury objectives to determine overall success. Because data are a critical part of the implementation process, a subcommittee of the Traffic Records Coordinating Committee (TRCC) will work with the ELC and Steering Committee to ensure data are available for SHSP reporting and evaluation. The TRCC is a multiagency committee that regularly meets to plan and implement safety data improvements.

STRATEGY TIERS

The Massachusetts Strategic Highway Safety Plan update is organized to focus attention on the traffic safety problems exhibited by each emphasis area. An emphasis area is classified as Strategic, Proactive, or Emerging based on the number of fatalities, hospitalizations, or incapacitating injuries resulting from crashes related to the emphasis area.

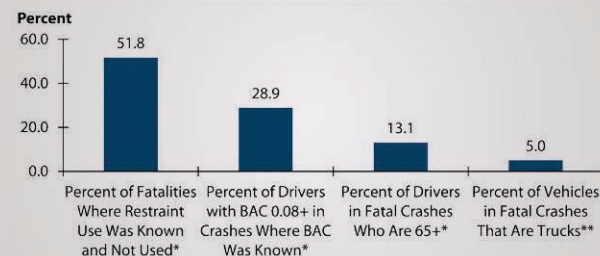
MASSACHUSETTS SHSP EMPHASIS AREA AVERAGE ANNUAL STATISTICS (2007-2011)

Percent Total Fatalities



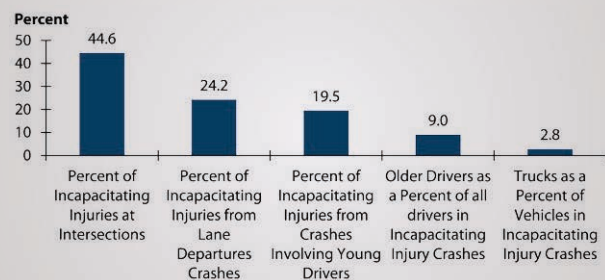
Sources: * = Fatality Analysis Reporting System – National Highway Traffic Safety Administration, ** = Federal Highway Administration – Directors of Field Services (2004-2006); Fatality Analysis Reporting System – National Highway Traffic Safety Administration (2007-2011).

Other Fatality Percentage Statistics



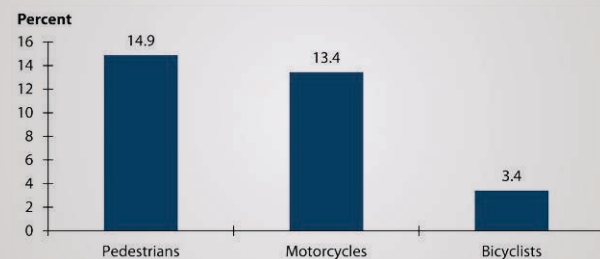
Sources: * = Fatality Analysis Reporting System – National Highway Traffic Safety Administration, ** = Massachusetts Statewide Crash Data System.

Incapacitating Injury Percentage Statistics



Sources: Massachusetts Statewide Crash Data System.

Percent of Total Hospitalizations



Sources: Massachusetts Hospital Discharge, Outpatient Observation Stay and Emergency Department Discharge Databases, Massachusetts Division of Health Care Finance and Policy.

Strategic Emphasis Areas

Each emphasis area listed here represents at least 10 percent of annual fatalities or severe injuries on Massachusetts roadways.¹

- Impaired Driving
- Intersections
- Lane Departures
- Occupant Protection
- Speeding/Aggressive Driving
- Young Drivers
- Older Drivers
- Pedestrians
- Motorcycles

Proactive Emphasis Areas

Each of these emphasis areas represents less than 10 percent of annual fatalities or severe injuries on Massachusetts roadways. Strategies included within each emphasis area are designed to ensure fatalities and severe injuries for these areas are further reduced even though it may be more difficult in areas already experiencing very low crash rates.

- Bicycles
- Truck/Bus-Involved Crashes
- At-Grade Crossings
- Safety of Persons Working on Roadways

Emerging Emphasis Areas

These emphasis areas focus on continuously improving the data systems used to analyze traffic safety patterns and generate data on safety topics where the data currently are inconclusive.

- Data Systems
- Driver Inattention

¹ Severe injuries are based on injuries requiring hospitalizations or defined as incapacitating injuries by police reporting.

Impaired Driving

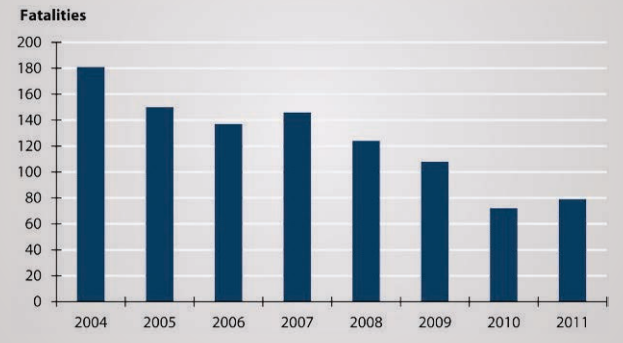
As in many other states, alcohol impaired driving is a serious problem in Massachusetts. One-third of all traffic fatalities from 2004 to 2011 were from crashes involving at least one driver with blood alcohol content (BAC) of 0.08 or greater, which is on par with the national average. Since the enactment of “Melanie’s Law” in 2005 to combat repeat alcohol-related driving offenses, the number of persons killed from crashes involving legally intoxicated drivers has decreased by more than 20 percent. The NHTSA publication, *Countermeasures That Work*, identifies several other significant trends that can be attributed to the decrease in alcohol-related crashes nationwide, including license revocations and demographic trends (e.g., an aging population and increased proportion of female drivers).

Nearly one-third of all fatalities in Massachusetts involve impaired driving. On average, over 100 people die each year in crashes where one or more of the victims have a blood alcohol concentration (BAC) at or above 0.08.

Year 2011 Survey data from the Behavior Risk Factor Surveillance System operated by the Massachusetts Department of Public Health indicate there is significant binge and heavy drinking behavior among Massachusetts residents. Binge drinking is defined as consumption of five or more drinks for men or four or more drinks for women, on any one occasion in the past month. Heavy drinking is defined as consumption of more than 60 drinks in the past month for men and consumption of more than 30 drinks in the past month for women. Over one-third of respondents aged 18–34 reported binge drinking behavior and approximately one-tenth of the same age group reported heavy drinking behavior.

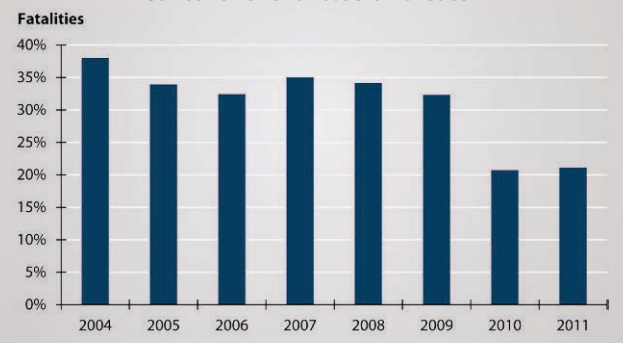
Massachusetts is making a concerted effort to address impaired driving laws by enhancing enforcement and by educating the public on the dangers of impaired driving. In 2012, law enforcement agencies in Massachusetts cited more than 15,700 drivers for operating motor vehicles under the influence of alcohol and drugs; in 2011, that number was fewer than 14,900.

Figure 5. Fatalities from Crashes Involving a Driver with a Blood-Alcohol Content Level of 0.08 or Greater



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

Figure 6. Percent of all Fatalities from Crashes Involving a Driver with a Blood-Alcohol Content Level of 0.08 or Greater



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

Objective

The following objective was adopted to reduce alcohol-related motor vehicle fatalities using 2011 as the baseline:

- Reduce five-year average alcohol-related motor vehicle fatalities by 20 percent (from 106 to 85) by 2017.

Accurate injury data for alcohol-related crashes are currently unavailable. An accompanying objective for alcohol-related incapacitating injuries will be developed when data become available.

Strategies

- Enhance collaborative enforcement efforts to reduce alcohol- and drug-related motor vehicle fatalities and injuries.
- Enhance collaboration between ABCC and law enforcement to enforce alcohol beverage-control laws and prevent alcohol service to underage youth and intoxicated persons.
- Provide targeted information and education programs to prevent alcohol-related motor vehicle fatalities and injuries.
- Educate the public on the dangers and consequences of impaired driving.

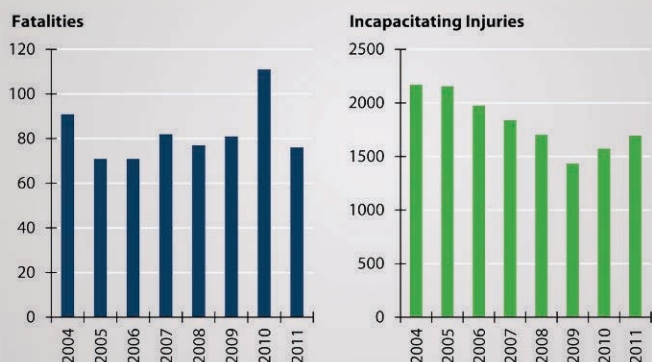
Intersections

According to MassDOT data for the period 2004 to 2011, 21 percent of all roadway fatalities and 44 percent of all roadway incapacitating injuries were associated with intersection crashes. These percentages have shown a slight increase on an annual basis during this time period although the overall number of intersection fatalities and incapacitating injuries has dropped dramatically. Most intersection crashes are located at four-way and three-way intersections. More than 1,000 fatal and incapacitating injury crashes from the 2004 to 2010 time period resulted from left-turns at signalized intersections.

More than one in five fatalities in Massachusetts involves an intersection. On average, over 80 people die in crashes at intersections every year.

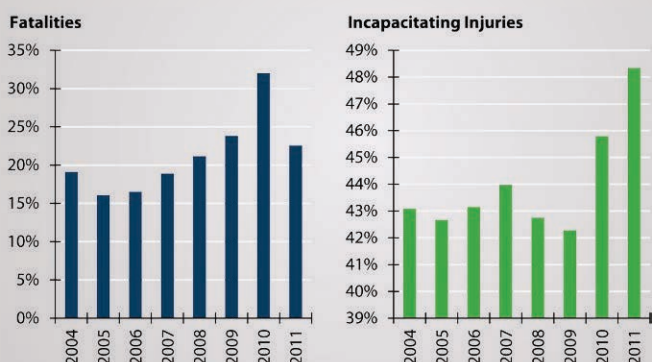
Massachusetts is addressing intersection crashes by incorporating safety criteria in project selection processes, incorporating safety elements in routine maintenance projects, conducting Road Safety Audits, and improving data systems to increase the quality of intersection crash information.

Figure 7. Fatalities/Incapacitating Injuries at Intersections



Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Figure 8. Percent of All Fatalities/Incapacitating Injuries from Intersection Crashes



Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Objectives

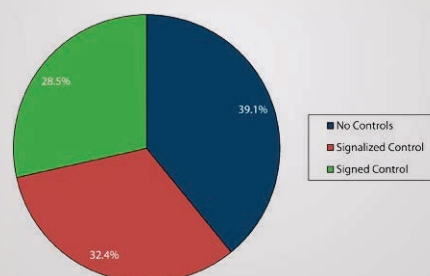
The following objectives were adopted to reduce intersection fatalities and incapacitating injuries using 2011 as the baseline:

- Reduce five-year average intersection fatalities by 20 percent (from 85 to 68) by 2017.
- Reduce five-year average intersection incapacitating injuries by 20 percent (from 1,649 to 1,319) by 2017.

Strategies

- Identify intersection crash locations and causes.
- Educate safety practitioners on best practices for design.
- Incorporate safety elements into intersection design and maintenance.
- Enhance enforcement of intersections.

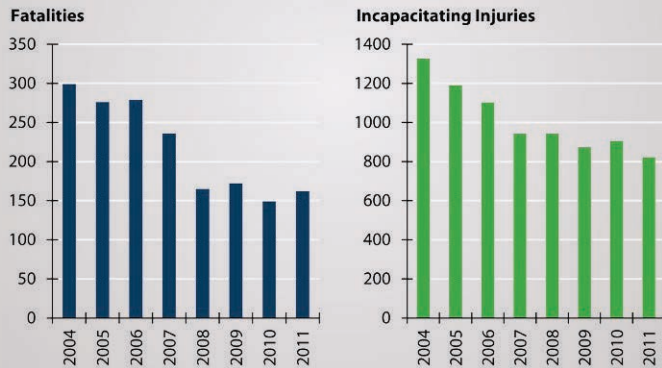
Figure 9. Intersection Control Type at Intersections with Fatal and Incapacitating Injury Crashes, 2004 to 2010



Source: Massachusetts Department of Transportation.

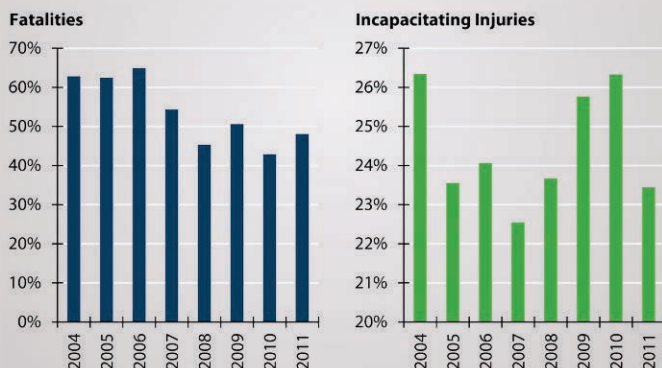
Lane Departures

Figure 10. Fatalities/Incapacitating Injuries from Lane Departure Crashes



Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Figure 11. Percent of All Fatalities/Incapacitating Injuries from Lane Departure Crashes



Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

A lane departure crash is a non-intersection crash which occurs after a vehicle crosses the edge or center line or otherwise leaves the traveled way. According to MassDOT data for the period 2004 to 2011, 55 percent of all roadway fatalities and 24 percent of all roadway incapacitating injuries involved lane departure crashes.

More than half of fatalities involve a lane departure crash, i.e., leaving the roadway to the right, crossing over the centerline or the median, etc. From 2007 to 2011, an average of 177 people died in lane departure crashes each year.

Fatal and incapacitating injury lane departure crashes during non-daylight hours are overrepresented; approximately half of lane departure crashes occur during non-daylight hours, however, less than half of daily travel trips occur during non-daylight hours. Most lane departure crashes occur while roadway conditions are dry. Most lane departure crashes in Massachusetts occur on urban roadways, under dry conditions, and during daylight hours or on lighted roadways at night.

Massachusetts is addressing lane departure crashes by incorporating safety criteria in project selection processes, incorporating safety elements in routine maintenance projects, conducting Road Safety Audits, and improving data systems to increase the quality of lane departure crash information.

Objectives

The following objectives were adopted to reduce lane departure fatalities and incapacitating injuries using 2011 as the baseline:

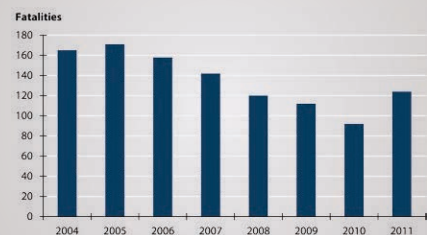
- Reduce five-year average lane departure fatalities by 20 percent (from 177 to 141) by 2017.
- Reduce five-year average lane departure incapacitating injuries by 20 percent (from 897 to 718) by 2017.

Strategies

- Identify lane departure crashes and causes.
- Educate safety practitioners on best practices for design.
- Incorporate safety elements into roadway design and maintenance.
- Enhance enforcement of some driver-contributing factors in lane departure crashes, e.g., driver inattention and speeding.

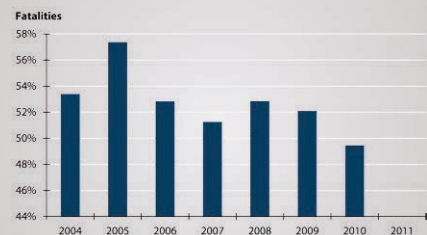
Occupant Protection

Figure 12. Unrestrained Fatalities from Motor Vehicle Crashes



Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

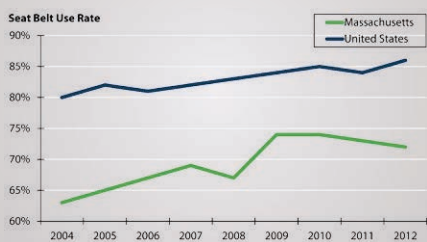
Figure 13. Unrestrained Fatalities, As a Share of All* Fatalities from Motor Vehicle Crashes



* Some vehicle types, e.g., motorcycles, are not included in the total.

Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

Figure 14. Massachusetts and United States Observed Seat Belt Use Rate Years



Sources: National Occupant Protection Use Survey (NOPUS), National Highway Traffic Safety Administration.

More than one-third of fatalities on Massachusetts roadways involve failure to use occupant protection devices, such as safety belts and child safety seats. From 2007 to 2011, an average of 118 people died each year. They might have been saved if they had used occupant protection devices.

Safety belt use is the single most effective means of preventing death or injury in a motor vehicle crash. NHTSA reports proper use of seat belts reduces the risk of fatal injury to front-seat passenger car occupants by 45 percent; and proper use of child safety seats reduce the risk of fatal injury by 71 percent for infants (less than 1 year old) and

by 54 percent for toddlers (1 to 4 years old). Federal Motor Carrier regulations require commercial motor vehicle drivers to wear safety belts.

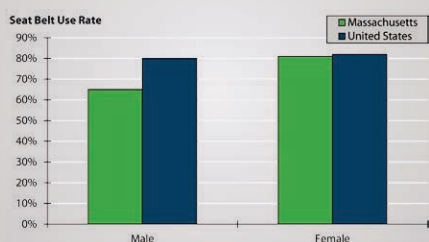
Although the use of seat belts increased by more than 10 percent between 2004 and 2011, Massachusetts continues to rank as one of the lowest states for seat belt use; the use rate is more than 10 percent lower than the national average. Massachusetts is one of 17 states that maintain a secondary enforcement law for seat belts.

Seat belt use rate for males in Massachusetts is consistent with nationwide trends that indicate a lower use rate than females; however, the disparity between genders is much more pronounced in the Commonwealth.

Drivers of pick-up trucks and commercial vehicles in Massachusetts have a markedly lower seat belt use rate than other motor vehicle types.

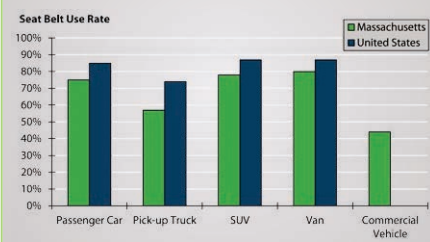
Massachusetts is addressing occupant restraint use by enhancing enforcement, educating the public on the benefits of occupant restraint use, and enhancing outreach efforts.

Figure 15. Massachusetts (Year 2012) and United States (Year 2011) Observed Seat Belt Use Rate by Gender



Sources: National Occupant Protection Use Survey (NOPUS), National Highway Traffic Safety Administration.

Figure 16. Massachusetts (Year 2012) and United States (Year 2011) Observed Seat Belt Use Rate by Vehicle Type



Source: National Occupant Protection Use Survey (NOPUS), National Highway Traffic Safety Administration.

Objective

The following objective was adopted to reduce unrestrained motor vehicle fatalities using 2011 as the baseline:

- Reduce five-year average unrestrained motor vehicle fatalities by 20 percent (from 117 to 93) by 2017.
- Increase observed safety belt usage rate by five percent by 2017.

Strategies

- Enhance enforcement of safety belt use in Massachusetts.
- Educate the public on use of safety belts and passenger restraints.

Accurate injury data for unrestrained motor vehicle occupants are currently unavailable. An accompanying objective for incapacitating injuries from unrestrained vehicle occupants will be developed when data become available.

Speeding and Aggressive Driving

From 2007 to 2011, an average of nearly 30 percent (103 fatalities) died on Massachusetts roadways each year due to speeding-related crashes.

NHTSA considers a crash to be speeding-related if the driver was charged with a speeding-related offense or if an

officer indicated that racing, driving too fast for conditions, or exceeding the posted speed limit was a contributing factor in the crash. Speeding is a prevalent factor in Massachusetts fatal crashes. According to MassDOT data for the period 2004 to 2011, 31 percent of all roadway fatalities involved speed, which is roughly the national average. Speeding and aggressive driving behavior is a serious problem for the traveling public. NHTSA estimates the national annual economic cost to society of speeding-related crashes is more than \$40 billion.

Young drivers are more likely to exhibit speeding behavior; national statistics from 2010 indicate 39 percent of male drivers in both 15- to 20-year-old and 21- to 24-year-old age groups, involved in fatal crashes were speeding.

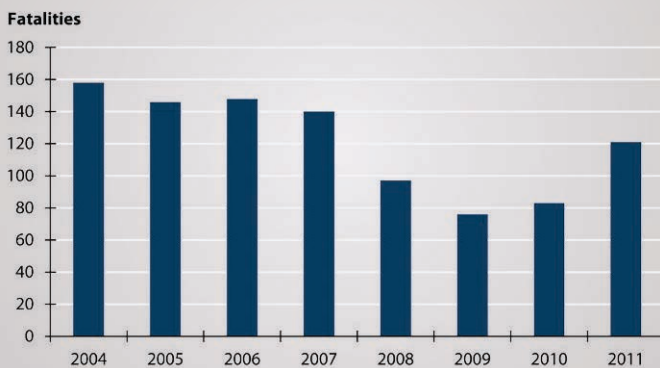
Approximately a quarter of females from these age groups exhibited similar behavior.

Speeding Crashes are not isolated to high-speed roadways; data from NHTSA indicate 40 percent of fatalities from crashes involving speed occur on Interstates, freeways, or expressways, while the remaining 60 percent are on arterials, collectors, and local roads.

Aggressive driving is exhibited in many different forms. Speeding excessively, changing lanes frequently without signaling, following too closely, flashing lights, driving on shoulders to pass, driving across marked barriers, shouting or gesturing at other drivers, uncontrolled anger, and stress created by traffic congestion are among the characteristics of aggressive driving.

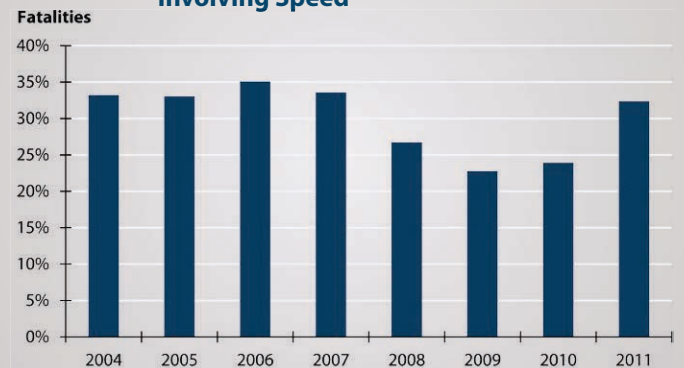
Massachusetts is addressing speeding and aggressive driving behavior by instituting enforcement and education measures to build greater public awareness of the impacts of such behavior. In 2012, over 220,000 speeding citations were issued by Massachusetts law enforcement agencies.

Figure 17. Fatalities from Crashes Involving Speed



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

Figure 18. Percent of All Fatalities from Crashes Involving Speed



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System.

Objective

The following objective was adopted to reduce fatalities from speeding crashes using 2011 as the baseline.

- Reduce five-year average fatalities from speeding crashes by 20 percent (from 103 to 83) by 2017.

Accurate injury data from speeding crashes are currently unavailable. An accompanying objective for injuries from speeding crashes will be developed when data become available.

Strategies

- Enhance enforcement efforts to curb speeding and aggressive driving.
- Improve the design and engineering of highway speed limits.
- Educate the public on the risks associated with speeding and aggressive driving behavior.

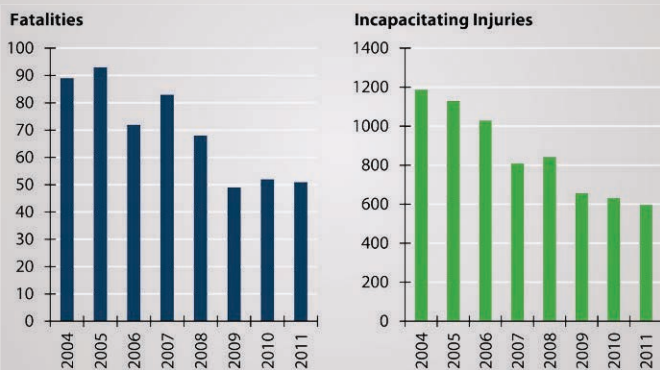
Young Drivers

From 2007 to 2011, an average of 61 young drivers (17 percent of all fatalities) were killed on Massachusetts roadways each year because of inexperience, poor judgment, speeding, impaired driving, and other factors.

According to the National Center for Health Statistics, motor vehicle crashes are the leading cause of death for all 15- to 20-year-olds. From 2004 to 2011, 18 percent of fatalities and 21 percent of incapacitating injuries on Massachusetts roadways were associated with crashes involving a young driver between the ages of 15 and 20. Massachusetts Department of Public Health data indicate 13 percent of drivers from 2004 to 2011 admitted for hospital stays after a non-fatal crash were

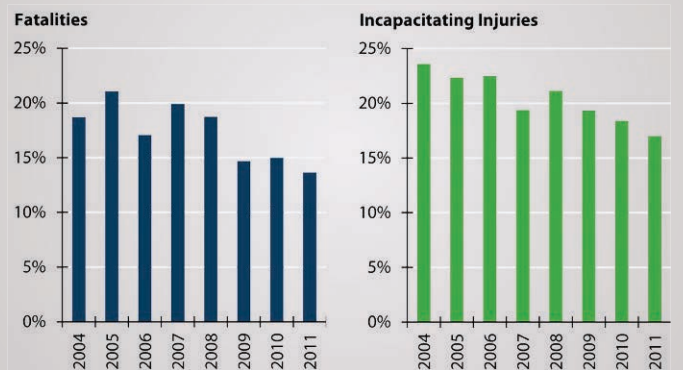
under 20 years of age. These young drivers were likely involved in crashes of greater severity; 40 percent of the admitted young drivers suffered a traumatic brain injury compared to one-third of drivers of other ages. Based on these statistics, young drivers are overrepresented in motor vehicle crashes in Massachusetts as they represent approximately 5 percent of all licensed drivers in the State. Young drivers are also over-represented in crashes with stop signs as the intersection control device; Massachusetts Department of Transportation data indicate 23 percent of fatal and serious injury crashes at these locations involved a young driver compared to 20 percent of fatal and serious injury crashes at all locations involving a young driver. The Massachusetts Department of Public Health Behavior Risk Factor Surveillance System survey from 2011 indicated 11 percent of 11th Grade students and 16 percent of 12th Grade students reported driving after drinking alcohol. The same survey indicated 36 percent of 11th Graders and 60 percent of 12th Graders reported texting while driving. In 2007, a major step was taken to improve young driver safety by introducing a Junior Operator Law (JOL) which places restrictions on night driving, passengers, and mobile electronic devices. Since the enactment of the JOL, the number and share of roadway fatalities and incapacitating injuries involving a young driver have decreased.

Figure 19. Fatalities/Incapacitating Injuries Involving Young Drivers



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Figure 20. Percent of All Fatalities/Incapacitating Injuries Involving Young Drivers



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Objectives

The following objectives were adopted to reduce young driver involved fatalities and incapacitating injuries using 2011 as the baseline:

- Reduce five-year average young driver-involved fatalities by 20 percent (from 61 to 48) by 2017.
- Reduce five-year average young driver-involved incapacitating injuries by 20 percent (from 707 to 566) by 2017.

Strategies

- Conduct research to more effectively impact crashes involving young drivers.
- Enhance enforcement efforts to impact traffic violations by young drivers.
- Improve education of young drivers, parents, and the general public.

Older Drivers

As Massachusetts experiences growth in the number of older drivers, health impairments that may affect their driving need to be addressed.

From 2004 to 2011, older drivers, age 65 and older, represented 12 percent of all Massachusetts drivers involved in fatal crashes and 20 percent of all driver hospital stays. According to Massachusetts Department of Public Health data, just over 20 percent of older drivers suffered a traumatic brain injury from non-fatal crashes. The older driver share of all drivers involved in fatal and incapacitating injury crashes in the State is less than the older driver share of all licensed drivers which was 16 percent in 2011. According to the national research literature, older drivers are less likely to drive impaired, unbelted, at high speeds, and on unfamiliar roads than the overall population of drivers. However, national statistics indicate on a per-mile basis, fatal crash rates increase for drivers starting at age 75 and increase markedly after age 80 due to increased susceptibility to injury and other medical complications resulting from a crash. The population age 65 years and older is growing in Massachusetts, as it is nationally. The U.S. Census Bureau estimates this population made up 14 percent of the Commonwealth's population in 2010 and will constitute 21 percent of the population by 2030. The number of licensed drivers age 65 and above also is increasing in Massachusetts. The Safe Driving Law from 2010 requires drivers age 75 or older to renew their licenses in person and pass an eye exam every five years, rather than the 10-year requirement for other age groups. The law also encourages health care providers to inform the Registry of drivers not fit to drive. Over the past 8 years, the number of traffic citations issued to those above the age of 65 have increased by 8 percent. Citations issued to older drivers have increased from 1.5 percent to 2.4 percent of all traffic citations. Older drivers are also over-represented in fatal and serious injury crashes at intersections.

Accommodating the safety needs of this growing population will continue to be an important part of transportation planning. MAP-21, the 2011 Federal legislation, requires states that experience an increase of older road user fatalities and serious injuries over two years to include countermeasures from FHWA's Older Driver and Pedestrian Design Guide.

Objectives

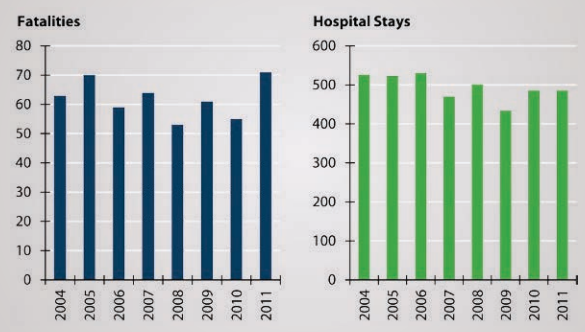
The following objectives were adopted to reduce older driver fatalities and incapacitating injuries using 2011 as the baseline:

- Reduce five-year average fatalities from crashes involving an older driver by 20 percent (from 61 to 49) by 2017.
- Reduce five-year average incapacitating injuries from crashes involving an older driver by 20 percent (from 485 to 388) by 2017.
- Improve satisfaction with transportation services offered, as well as knowledge about and access to the services.

Strategies

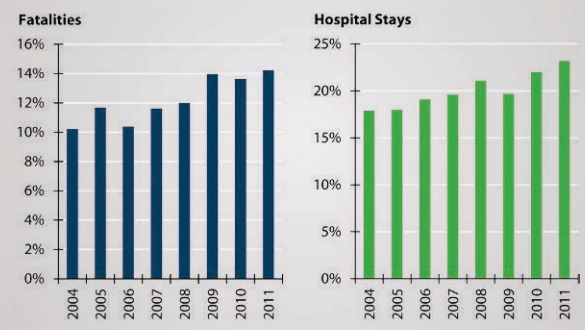
- Utilize existing data for improved problem identification.
- Support initiatives to improve the transportation system for older users.
- Develop infrastructure improvements that accommodate older road user needs.
- Educate older road users and the public on older road user safety.
- Provide alternative transportation.
- Licensing.
- Provide education and technical assistance to the medical and legal communities on older road user impairment.

Figure 21. Drivers Aged 65 and Over in Fatal and Hospital Stay Crashes



Source: Massachusetts Hospital Inpatient Discharge and Massachusetts Outpatient Observation Stay Databases, Massachusetts Center for Health Information and Analysis.

Figure 22. Drivers Aged 65 and Over, As a Share of All Drivers in Fatal and Hospital Stay Crashes



Source: Massachusetts Hospital Inpatient Discharge and Massachusetts Outpatient Observation Stay Databases, Massachusetts Center for Health Information and Analysis.

Pedestrians

According to NHTSA, Massachusetts has a lower rate of pedestrian fatalities than the national average (0.88 versus 1.38 fatalities per 100,000 persons) and has experienced a decline in these fatalities from 2008 to 2010 (1.15 to 0.88 fatalities per 100,000 persons).

Walking is a popular, environmentally friendly, and healthy mode of travel. However, pedestrians are more susceptible to some risks. Contributing factors to pedestrian fatalities and injuries include inadequate facilities for these users of the transportation system, lack of awareness of the risks and responsibilities of both drivers and pedestrians, noncompliance with traffic statutes, and alcohol use by pedestrians. Although Massachusetts has a lower rate of pedestrian fatalities than the national average, the Commonwealth exceeds the U.S. average in pedestrian fatalities as a share of overall traffic fatalities. In 2010, this figure was 18.5 percent for the State versus 13 percent nationally.

From 2004 to 2011, data from the Massachusetts Department of Public Health indicate hospitalizations of male pedestrians outnumbered females 57 percent to 43 percent. Persons 65 and over are over-represented in pedestrian hospitalizations. From 2004 to 2011, persons aged 65 and over accounted for one-third of pedestrian fatalities and more than 20 percent of hospitalized pedestrians, while their share of the state population was approximately 14 percent. Young pedestrians also are impacted by crashes with motor vehicles. More than 40 percent of injured pedestrians between the ages of 10 and 20 suffered a traumatic brain injury, compared to 35 percent of pedestrians of all ages.

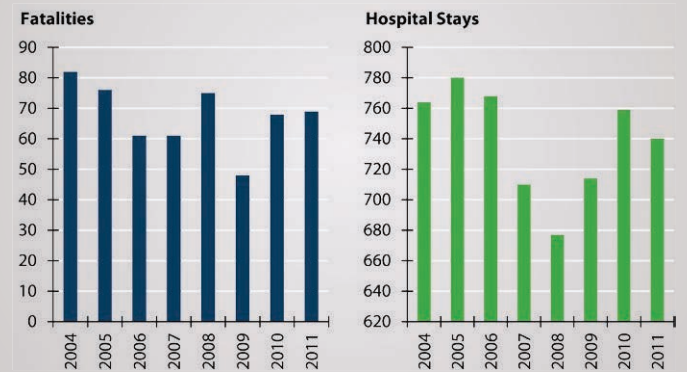
Massachusetts agencies are involved in a variety of initiatives to promote pedestrian safety. These initiatives include the application of Complete Streets in project development, the Moving Together annual bicycle and walking conference, the Safe Routes to School program, and interagency collaboration promoting safety and education programs. The Massachusetts Pedestrian Transportation Plan was developed with recommendations to deliver a more pedestrian-focused transportation system that connects with other healthy transportation networks.

Objectives

The following objectives were adopted to reduce pedestrian fatalities and hospitalizations using 2011 as the baseline:

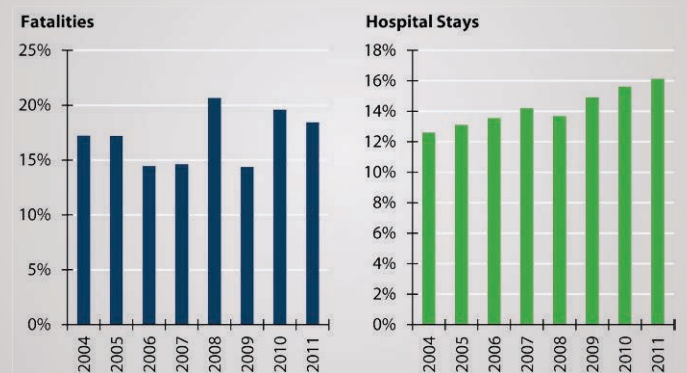
- Reduce five-year average pedestrian fatalities by 20 percent (from 64 to 51) by 2017.
- Reduce five-year average pedestrian hospitalizations by 20 percent (from 720 to 576) by 2017.

Figure 23. Pedestrian Fatalities and Hospital Stays from Motor Vehicle Crashes



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Public Health.

Figure 24. Pedestrians, As a Share of All Fatalities and Hospital Stays from Motor Vehicle Crashes



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Public Health.

Strategies

- Provide training and technical assistance to improve the design and engineering of pedestrian facilities.
- Educate the public on pedestrian safety.
- Integrate pedestrian safety activities with other plans.
- Incorporate changes precipitated by new directives related to healthy transportation.

Motorcycles

According to NHTSA, motorcycle helmet usage in Massachusetts greatly exceeds the national average (89 percent to 58 percent).

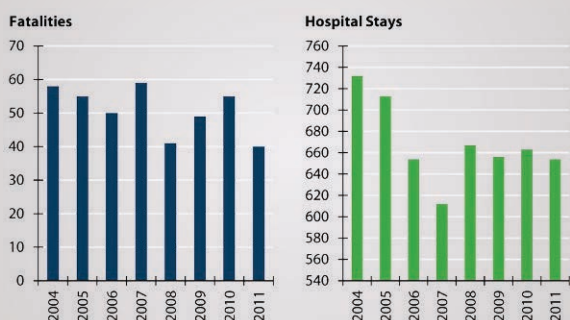
Motorcyclists represent a group of high-risk transportation system users given the inherent danger of using a motorized vehicle without a safety cage. The percentage of all fatal crashes involving a motorcycle has increased steadily over the past decade, rising from 11 to 15 percent

even though Massachusetts has a mandatory helmet law. Massachusetts exceeds the U.S. average in motorcyclist fatalities as a share of overall traffic fatalities. In 2010, this figure was 16 percent for the State versus more than 13 percent nationally. The inherent danger of using a motorcycle is more apparent by comparing the fatality share of motorcyclists against the motorcycle share of daily trips in Massachusetts which is only a fraction of one percent. In addition, motorcycles represent just under three percent of all registered motor vehicles in Massachusetts.

From 2004 to 2011, data from the Massachusetts Department of Public Health indicate hospitalization of male motorcyclists outnumbered females nine to one. Persons ages 25 to 54 are overrepresented in motorcyclist hospitalizations. From 2004 to 2011, persons aged 25 to 54 accounted for 65 percent of hospitalized motorcyclists over the age of 16, while their share of the State population over the age of 16 was approximately 55 percent. A quarter of all hospitalized motorcyclists were admitted with a traumatic brain injury.

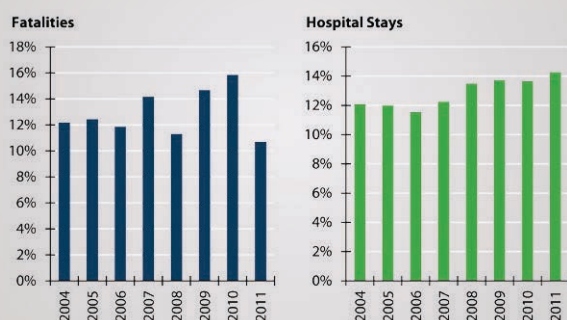
The Massachusetts Registry of Motor Vehicles sponsors the Massachusetts Rider Education Program (MREP). The mission of MREP is to reduce the number of motorcycle related fatalities and injuries in the Commonwealth by increasing the statewide availability of Motorcycle Safety Foundation (MSF) approved training courses for motorcyclists and to increase awareness and education for both motorcyclists and drivers. Education and experience have a correlation with fatalities; data from MREP indicate 40 percent of male motorcycle fatalities owned their motorcycle less than one year. Other data from MREP indicate 41 percent of male motorcycle fatalities from 2001 to 2009 resulted from crashes on Saturdays and Sundays while one-quarter of motorcycle fatalities were from crashes between 6:00 p.m. and 9:00 p.m.

Figure 25. Motorcyclist Fatalities and Hospital Stays from Motor Vehicle Crashes



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Public Health.

Figure 26. Motorcyclists, As a Share of All Fatalities and Hospital Stays from Motor Vehicle Crashes



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Public Health.

Objectives

The following objectives were adopted to reduce motorcyclist fatalities and hospitalizations using 2011 as the baseline:

- Reduce five-year average motorcyclist fatalities by 20 percent (from 49 to 39) by 2017.
- Reduce five-year average motorcyclist hospitalizations by 20 percent (from 650 to 520) by 2017.

Strategies

- Improve and enhance motorcycle safety training and communications opportunities.
- Enhance motorcycle enforcement.
- Improve analysis of motorcycle crashes.
- Increase motorcycle safety awareness.

Bicycles

Although bicyclist fatalities and hospitalizations from roadway crashes do not constitute a significant portion of the overall statewide fatality and hospitalization totals, at two percent and three percent respectively, this mode of travel is becoming increasingly popular; therefore, strategies are needed to enhance safety. Ensuring the safety of bicyclists, particularly in the urban centers where traffic by all modes is particularly dense, is imperative to mitigate bicycle-automobile conflicts and at the same time, encourage bicycle travel.

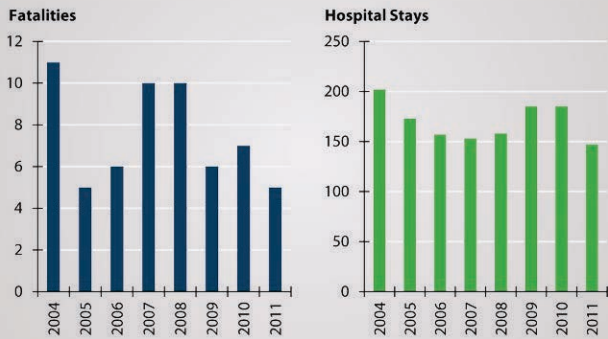
From 2004 to 2011, data from the Massachusetts Department of Public Health indicate hospitalizations of male bicyclists outnumbered females five to one. Young bicyclists are over-represented in bicyclist hospitalizations. From 2004 to 2011, persons aged 20 or under accounted for more than 35 percent of hospitalized bicyclists while their share of the State population is approximately 25 percent. Half of all hospital stays by injured bicyclists aged 20 or under involved treatment for a traumatic brain injury, compared to two-thirds of bicyclists of all ages.

Ensuring the safety of bicyclists, particularly in the urban centers where traffic by all modes is particularly dense, is imperative to mitigate bicycle-automobile conflicts and, at the same time, encourage bicycle travel.

Data from the Massachusetts Department of Transportation indicate two-thirds of fatal and serious injury bicycle crashes occurred at intersections and driveways; one-quarter of these crashes occurred at intersections without crosswalks while another quarter occurred at intersections with a crosswalk.

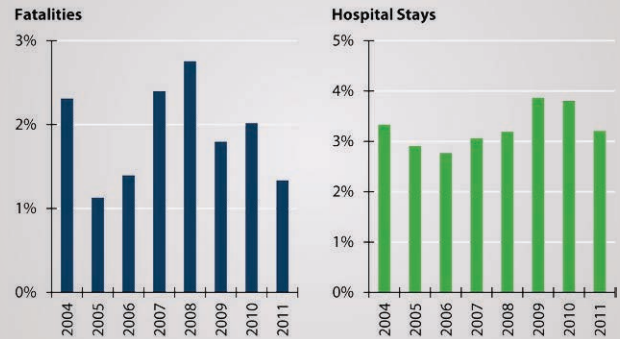
Massachusetts recognizes the need to improve conditions for bicycling. Programmatic investments have been made in share-the-road initiatives, bicycle/pedestrian conferences, and interagency collaboration promoting safety, driver training, and education programs. The Massachusetts Bicycle Transportation Plan was developed to identify and prioritize improvements to existing infrastructure and to promote supportive policies.

Figure 27. Bicyclist Fatalities and Hospital Stays from Motor Vehicle Crashes



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Public Health.

Figure 28. Bicyclists, As a Share of All Fatalities and Hospital Stays from Motor Vehicle Crashes



Source: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Public Health.

Objective

- Further reduce the already relatively low number of fatalities and hospitalizations from bicycle crashes.

Strategies

- Improve design and engineering of bicycle facilities.
- Educate the public on bicycle safety.
- Integrate bicycle safety activities with other plans.
- Incorporate changes precipitated by new directives related to healthy transportation.

Truck/Bus-Involved Crashes

Crashes involving commercial motor vehicles (CMV) are an area of concern in Massachusetts. From 2004 to 2011, large trucks represented 5 percent of vehicles involved in fatal crashes and three percent of vehicles involved in incapacitating injury crashes in the State. Although this is a relatively small percentage, crashes involving CMVs remain a priority among traffic safety professionals as these crashes tend to be severe particularly in collisions with passenger cars. Also, the percentage appears to be increasing. According to the Massachusetts State Police Commercial Vehicle Enforcement Section, in 2011 more than 1,880 crashes involved a CMV and accounted for 8.5 percent of all crash deaths. The fatal crash rate per vehicle miles traveled for CMVs was more than five times higher than that of non-CMV crashes and the injury crash rate was two times higher than the rate for non-CMV crashes. One-third of all crashes involving CMVs are angle crashes. Despite conventional wisdom, only 17 percent of CMV crashes occur on freeways whereas 60 percent of these crashes occur on two-way undivided roadways. CMV crashes generally occur on weekdays during business hours. CMV crashes also may result in severe secondary effects, such as hazardous material spills, unexpected traffic congestion, or secondary crashes.

On average, 85 percent of CMV operators in crashes had no documented driver contributing code noted on the crash report. For those reports that included a driver contributing code, driver distraction was the most common issue reported.

In 2011, the overall safety belt usage rate for CMV drivers in Massachusetts was almost 55 percent, which is significantly lower than both the national average of 80 percent for CMV drivers and the non-CMV Massachusetts belted rate of almost 74 percent.

Objective

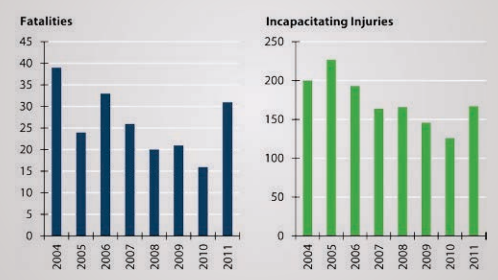
- To reduce or maintain the 0.06 truck/bus fatality rate per hundred million vehicle miles traveled to maintain one of the lowest rates in the country.
- To reduce the number of Massachusetts CMV crashes by 3 percent in regions of MSP Troops/Barracks with higher Equivalent Property Damage Only (EPDO) crash rankings (B-3, H-4, D-4, and A-1) by 2015.
- To improve the FMCSA State Safety Data Quality (SSDQ) rating for crash report timeliness from Fair to Good by 2015.

Strategies

- Enhance enforcement of motor carrier safety.
- Increase awareness of motor carrier safety.
- Improve data quality and collection.
- Provide engineering roadway improvements.
- Improve Massachusetts motor carrier systems.

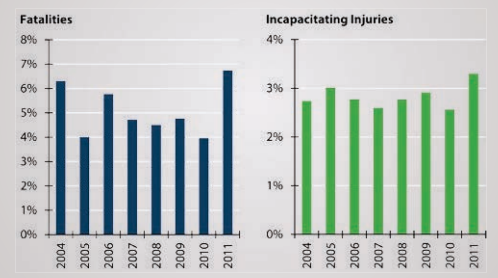
According to the Massachusetts State Police Commercial Vehicle Enforcement Section, in 2011 more than 1,880 crashes involved a Commercial Motor Vehicle accounting for 8.5 percent of all fatalities.

Figure 29. Large Trucks Involved in Fatal/Incapacitating Injury Crashes



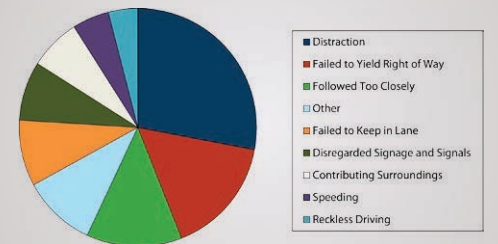
Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Figure 30. Large Trucks, As a Share of All Vehicles Involved in Fatal/Incapacitating Injury Crashes



Sources: Massachusetts Department of Transportation and National Highway Traffic Safety Administration Fatality Analysis Reporting System and Massachusetts Department of Transportation Crash Data System.

Figure 31. CMV Driver Contributing Factors in Massachusetts Crashes, 2010 to 2011



Source: Massachusetts State Police Commercial Vehicle Enforcement Section.

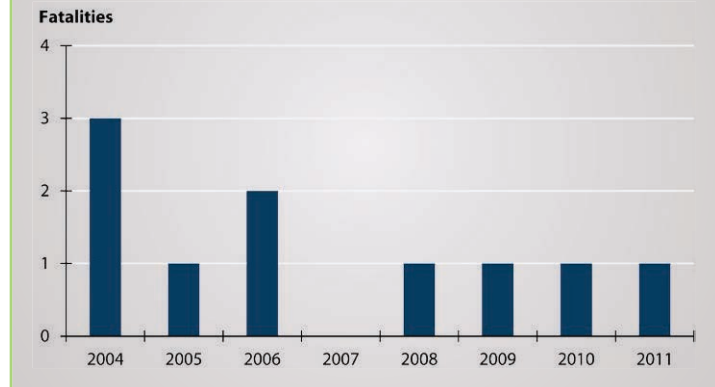
At-Grade Crossings

Between 2004 and 2011, 10 people were killed and 53 were injured from crashes occurring at highway-rail grade crossings.

Although the number of crashes at highway-rail grade crossings are far fewer than vehicular crashes, the consequences are more severe due to the weight and speed of rail equipment. Grade crossing crashes put the safety of people at risk, including vehicle occupants, as well as rail passengers and train crews. Between 2004 and 2011, 10 people were killed and 53 were injured from crashes occurring at highway-rail grade crossings, with a large number of injuries resulting from one commuter train/tractor trailer truck crash in 2006.

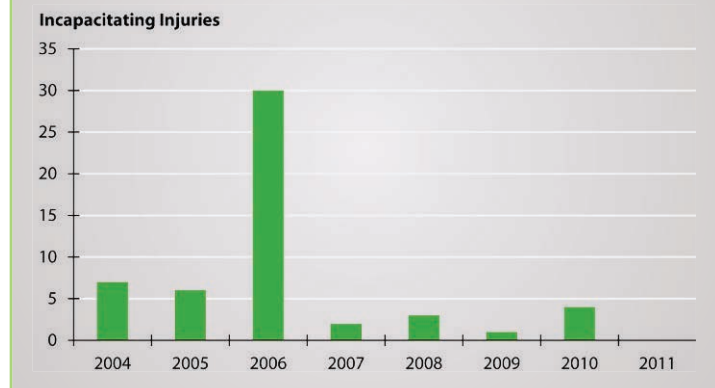
The MassDOT Highway Division administers Federal funds under Section 130 of Federal surface transportation law to eliminate or mitigate hazards at public highway-rail grade crossings. There are 1,431 highway-rail grade crossings in Massachusetts, with 835 active crossings on public roads. The MassDOT Grade Crossing Program focuses on improving safety at existing highway-railroad grade crossings primarily through the installation of warning devices. The Massachusetts policy is to reduce, wherever possible, the number of highway-rail grade crossings on public thoroughfares. Many of these crossings have been permanently closed under this initiative. Massachusetts needs to build public awareness about the dangers associated with these crossings and ensure motor vehicle drivers understand their responsibilities.

Figure 32. Fatalities from Highway-Rail Grade Crossing Crashes



Source: Federal Railroad Administration.

Figure 33. Nonfatal Injuries from Highway-Rail Grade Crossing Crashes



Source: Federal Railroad Administration.

Objective

- Further reduce the already relatively low number of fatalities and incapacitating injuries from at-grade crossing crashes.

Strategy

- Enhance at-grade rail crossing safety.
- Educate everyone about safe crossing practices.
- Improve data collection and analysis capabilities.
- Improve communication and collaboration among those responsible for rail grade crossing safety.

Safety of Persons Working on Roadways

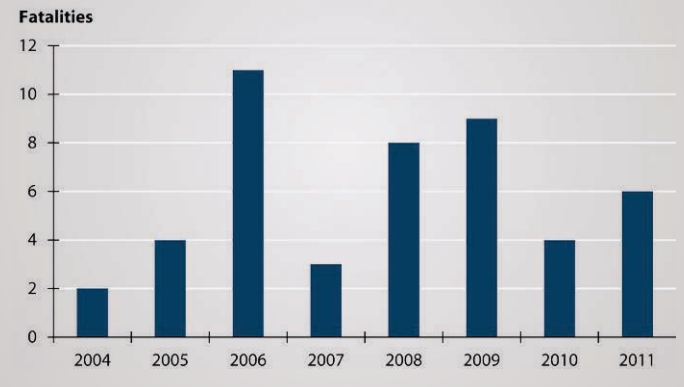
From 2004 to 2011, NHTSA FARS data show 47 persons were killed from crashes in highway work zones in Massachusetts.

Highway work zones are a safety concern for both motorists and workers. Drivers and the highway workers face the unique situation of sharing limited space which reduces the amount of roadway for a driver to maneuver and places a worker much closer to moving traffic, often traveling at high speeds. Between 2004 and 2011, 47 persons were killed from crashes in highway work zones in Massachusetts.

A broad range of workers are at risk while working on the roadway in addition to construction workers and law enforcement. For example, roadway worker safety issues affect drivers and passengers of passenger vehicles, commercial motor vehicles, and tow truck operators, motorcyclists, and others.

Reliable, accurate work zone crash nonfatal injury data is not presently available, however; efforts are being made to improve data systems to enable the reporting of these statistics. Massachusetts agencies are actively involved in promoting traffic safety in work zones, including the annual Highway Work Zone Awareness Week at the beginning of the highway construction season. The Massachusetts Work Zone Speed Enforcement program which began in November 2011 resulted in more than 3,000 speeding citations at work zones within the first six months and also resulted in 400 citations for nonuse of seat belts and 75 citations for aggressive driving.

Figure 34. Fatalities from Roadway Work Zones in Massachusetts



Source: Massachusetts Department of Transportation.

Objective

- Identify methods and measures to quantify the problem.

Strategies

- Ensure work zones and other traffic incident set-ups are designed and constructed to maximize safety.
- Increase enforcement to enhance safety for all people working on the roadway.
- Educate the driving public about the importance of driving safely in work zones and other traffic incident locations.
- Develop processes for collecting data to measure and quantify fatalities and injuries to better understand crashes involving roadway workers.

Data Systems

Crash, roadway, citation, medical, vehicle registration, and driver history data are valuable tools for identifying safety problems, evaluating potential solutions, and measuring performance towards shared goals and objectives.

Massachusetts stakeholders determined the availability of data and analysis tools are critical for identifying safety problems at the State, regional, and local levels. In addition to crash data, roadway, citation, medical, vehicle registration, and driver history data are valuable tools for identifying safety problems, evaluating potential solutions, and measuring performance towards shared goals and objectives.

Strategies for this emphasis area will be monitored and coordinated by the Traffic Records Coordinating Committee (TRCC) which is responsible for overall data improvements in the Commonwealth. A subcommittee of the TRCC will be developed as part of the strategies for this emphasis area and will be tasked with identifying data needs and determining how data will measure SHSP performance through the use of timely, accurate, complete, consistent, uniform, integrated, and accessible data. All SHSP data strategies are consistent with those included in the Massachusetts Strategic Plan for Traffic Records Improvement, developed by the Highway Safety Division (HSD) of the Executive Office of Public Safety and Security (EOPSS) and managed by the TRCC.



Objective

- Continuously improve the timeliness, accuracy, completeness, consistency/uniformity, integration, and accessibility of traffic safety data.

Strategies

- Develop a TRCC Subcommittee.
- Identify data needs and review the performance measures in the SHSP.

Driver Inattention

Driver inattention is increasingly involved in fatal and serious injury crashes in Massachusetts. In 2011, 3,331 people were killed and 387,000 were injured nationwide in crashes involving an inattentive driver. This represents 10 percent of all highway fatalities and 17 percent of all highway injuries.

Driver inattention occurs when the driver fails to observe due diligence on the road. The causes for shifting attention away from the task are varied, such as adjusting a radio, attending to a child, thinking about day-to-day worries, using a cell phone, and driver fatigue. According to the National Sleep Foundation's 2005 Sleep in America poll, 60 percent of adult drivers say they have driven a vehicle while feeling drowsy in the past year, and more than one-third have actually fallen asleep at the wheel. Anyone can be fatigued while driving and experience a decrease in alertness or microsleep. The U.S. Department of Transportation (DOT) indicates 16 percent of all driver inattention crashes are caused by drivers under the age of 20 or those who are most inexperienced. DOT estimates at any given moment during the day, over 800,000 vehicles are being driven by someone using a handheld cell phone. The Massachusetts Safe Driving Bill instituted a ban on all cell phone use for bus drivers and novice drivers and a ban on texting for all drivers. National statistics on driver distraction indicate:



Source: Cambridge Systematics.

- In 2011, 3,331 people were killed and 387,000 were injured in crashes involving a distracted driver. These statistics compare unfavorably to 2010 when 3,267 were killed and 416,000 were injured in distracted driving crashes. (U.S. DOT)
- Eighteen percent of injury crashes in 2010 were reported as distraction-affected crashes. (U.S. DOT)
- Forty percent of all American teens say they have been in a car when the driver used a cell phone in a way that put people in danger. (Pew Charitable Trust)
- Text messaging creates a crash risk 23 times worse than driving while not distracted. (VTTI)
- Sending or receiving a text takes a driver's eyes from the road for an average of 4.6 seconds, the equivalent – at 55 mph – of driving blind the length of an entire football field. (VTTI)
- Headset cell phone use is not substantially safer than handheld use. (VTTI)
- Driving while using a cell phone reduces the amount of brain activity associated with driving by 37 percent. (Carnegie Mellon)

Massachusetts law enforcement agencies are increasing enforcement of distracted driving. The proportion of all traffic citations that involve violations of the Safe Driving Bill has increased each year since the implementation of the ban.

Objectives

- Improve data on driver inattention.
- Increase driver attentiveness.

Strategies

- Develop public information and enforcement programs to reduce inattentive driving.
- Develop processes to collect data to measure/quantify fatalities and injuries to better understand driver inattention.
- Develop and deliver targeted training on the dangers of inattentive driving.
- Incorporate design elements into roadway engineering to combat inattentive and drowsy driving.



SHSP Implementation

Effective implementation of the SHSP will require on-going communication and coordination among all stakeholders. The majority of implementation will be through the strategies in each of the emphasis areas. Each emphasis area is monitored by a lead agency that volunteered to take on the important task of developing an action plan supplemented by performance measures to track effectiveness. The agencies and individuals committed to leading emphasis area teams are as follows:

- **Impaired Driving** – HSD (Caroline Hymoff)/MSP (Dan Griffin/Tom Fitzgerald)
- **Intersections** – MassDOT Highway (Jim Danila)
- **Lane Departures** – MassDOT Highway (Jim Danila)
- **Occupant Protection** – HSD (Caroline Hymoff)
- **Speeding/Aggressive** – MSP (Dan Griffin/Tom Fitzgerald)
- **Young Drivers** – DPH (Colleen McGuire) and RMV (Michele Ellicks)
- **Older Drivers** – RMV (Michele Ellicks)
- **Pedestrians** – MassDOT Planning (Steve Woelfel/Josh Lehman)
- **Motorcycles** – RMV (Gene Carabine)
- **Bicyclists** – MassDOT Planning (Steve Woelfel/Josh Lehman)
- **Truck/Bus Involved** – MSP (Tom Fitzgerald)
- **Rail/Highway Crossings** – MassDOT Transit and Rail (Jody Ray/Tim Doherty)
- **Safety of Persons Working in Roadway** – MassDOT Highway (Neil Boudreau) and MSP (Andy Klane)
- **Data Systems** – TRCC (Barbara Rizzuti)
- **Driver Inattention** – HSD (Caroline Hymoff)

The ELC will meet periodically to provide leadership and oversight of the SHSP implementation process. The Steering Committee will meet more frequently than the ELC to review progress in each of the emphasis areas; provide assistance to overcome barriers or solve problems; receive regular updates on SHSP-related campaigns, training, or other programs; provide guidance on future programs, activities, etc.; make recommendations to the ELC; and determine the need and design of future SHSP updates.

The lead agency for an emphasis area will coordinate with key stakeholders to track the progress of strategies, celebrate successes, and identify barriers. Activities for an emphasis area may include developing action plans; discussing action step implementation progress; coordinating next steps; identifying problems or barriers; reporting to the Steering Committee; determining whether changes are needed in strategies and action steps as the plan moves forward; and tracking and reporting progress.

As additional data become available, fatality and injury performance measures will be updated to determine whether sufficient progress is being made in each emphasis area. As a living document, the SHSP will be updated as needed, and at a minimum, be reviewed in conjunction with updates to Massachusetts' statewide transportation improvement plan.

Implementation will also involve an evaluation to track progress and evaluate effectiveness. The plan includes a short-term goal to reduce fatalities and serious injuries by 20 percent over 5 years. Additional performance measures may be introduced at the emphasis area level where appropriate. Each emphasis area is assigned to one or more partner agencies to lead implementation. The team leaders will organize emphasis area teams that will prepare action plans for each strategy. The teams will examine the data, review the research, reach out to additional partners, identify and address the challenges, identify the necessary resources needed for implementation and track and evaluate progress. The team leaders will regularly brief their individual agency's leadership, the SHSP Executive Leadership Committee, the Steering Committee, and other stakeholders. They will also participate in marketing activities to ensure the SHSP has a broad impact and influence on the Massachusetts safety culture.

Throughout the implementation process over the next five years, the SHSP will be a dynamic document that stakeholders will update, review, and improve. This type of evaluation will enable Massachusetts to keep up-to-date with the latest research and tools and make the appropriate adjustments when necessary.



Acronym List

AASHTO	American Association of State Highway and Transportation Officials	MCOPA	Massachusetts Chiefs of Police Association
ABCC	Alcoholic Beverages Control Commission	MCSAP	Motor Carrier Safety Assistance Program
BAC	Blood Alcohol Content	MDAA	Massachusetts District Attorneys Association
BAT	Breath Alcohol Test	MMUCC	Model Minimum Uniform Crash Criteria
BEH	Bureau of Environmental Health	MOU	Memorandum of Understanding
BSAS	Bureau of Substance Abuse Services	MAP-21	Moving Ahead for Progress in the 21 st Century
CDL	Commercial Driver's License	MPTC	Municipal Police Training Committee
CDS	Crash Data System	MREP	Motorcycle Rider Education Program
CIOT	Click It or Ticket	MSP	Massachusetts State Police
CMV	Commercial Motor Vehicles	MUTCD	Manual on Uniform Traffic Control Devices
CVES	Commercial Vehicle Safety Section	NCHRP	National Cooperative Highway Research Program
CPS	Child Passenger Safety	NCSA	National Center for Statistics and Analysis
CVISN	Commercial Vehicle Information Systems and Networks	NHTSA	National Highway Traffic Safety Administration
DOT	Department of Transportation	OUI	Operating Under the Influence
DRE	Drug Recognition Expert	PBIC	Pedestrian and Bicycle Information Center
DSOGPO	Drive Sober or Get Pulled Over	PI&E	Public Information and Education
DVIP	Division of Violence and Injury Prevention	PNF	Project Need Form
EOPSS/HSD	Executive Office of Public Safety and Security/ Highway Safety Division	PRISM	Performance and Registration Information Systems Management
EPDO	Equivalent Property Damage Only	PSS	Public Safety Services
FHWA	Federal Highway Administration	RMV	Registry of Motor Vehicles
FMCSA	Federal Motor Carrier Safety Administration	RPA	Regional Planning Agency
GHSA	Governors Highway Safety Association	SADD	Students Against Destructive Decisions
HRRRP	High-Risk Rural Roads Program	SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users
HSIP	Highway Safety Improvement Program	SCARR	State Courts Against Road Rage
IPCP	Injury Prevention Control Program	SHSP	Strategic Highway Safety Plan
ITS	Intelligent Transportation Systems	SRTS	Safe Routes To School
JOL	Junior Operator Law	STIP	Statewide Transportation Improvement Program
LEL	Law Enforcement Liaison	STP	Surface Transportation Program
MADD	Mothers Against Drunk Driving	TBD	To Be Determined
MARPA	Massachusetts Association of Regional Planning Agencies	TIP	Transportation Improvement Program
DPH	Massachusetts Department of Public Health	TOPS	Traffic Occupant Protection Strategies
MassDOT	Massachusetts Department of Transportation	TRCC	Traffic Records Coordinating Committee
MATRIS	Massachusetts Ambulance Trip Record Information System	VMT	Vehicle Miles of Travel
		VTTI	Virginia Tech Transportation Institute

Massachusetts Department of Transportation
10 Park Plaza, Suite 4160 | Boston, MA 02116