

## **THE BOSTON REGION MPO'S VISION FOR THE SAFETY OF THE REGIONAL TRANSPORTATION SYSTEM**

Safety initiatives will be implemented to help protect the region from natural and human hazards. Transportation infrastructure and its operation will be upgraded on an ongoing basis for the safety of all users. Technologies will be employed to manage incidents, conduct emergency response, and support safe evacuations using various transportation modes. Highway and transit infrastructure will be kept in a state of good repair. There will be fewer crashes, due to improved intersection designs and upgrades.

To implement this vision, the MPO has developed a set of policy statements to guide its decision-making:

- Support designs and fund projects and programs that address safety problems and enhance safe travel for all system users. This includes designs and projects that encourage motorists, public transportation riders, bicyclists, and pedestrians to share the transportation network safely.
- Support, through planning and programming, the installation, operation, upgrading, and timely maintenance of system infrastructure, including intelligent transportation systems (ITS), to provide for safety.
- Participate in regional planning for safety initiatives, such as evacuation and contingency measures.

### **INTRODUCTION**

Safety for motorized and nonmotorized users is an important component of the metropolitan transportation planning process. Furthermore, safety has been

designated as a new, stand-alone planning factor by the federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

This chapter begins with a discussion of SAFETEA-LU requirements and Transportation Safety Planning (TSP, formerly Safety Conscious Planning). Discussions follow of the various components of highway, transit, pedestrian, bicycle, and freight safety. These discussions include information on planning and operations programs to provide safer transportation within the MPO area.

## Background

Safety is defined by the United States Department of Transportation, through the Federal Highway Administration (FHWA) and the Federal Transit Administration, as freedom from unintentional harm. The transportation network, both the highway infrastructure and the transit system and services, should serve its purpose without endangering the people who use it. The network should be designed, maintained, operated, and managed with the safety of all users in mind and be properly policed to protect users from accidents, crashes, and assaults. Constructing improvements at high-crash locations, providing an intelligent transportation system for incident response and management, preventing conflicts at grade crossings, and providing the equipment for surveillance and enforcement are examples of safety projects and programs that the state's transportation agencies have implemented.

According to FHWA, in the year 2004 alone, traffic accidents in this country resulted in approximately 42,600 fatalities and nearly 3,000,000 injuries. There were 4,281,000 property damage crashes at a cost of about \$230 billion to the United States economy. This equals about \$820 per U.S. citizen.

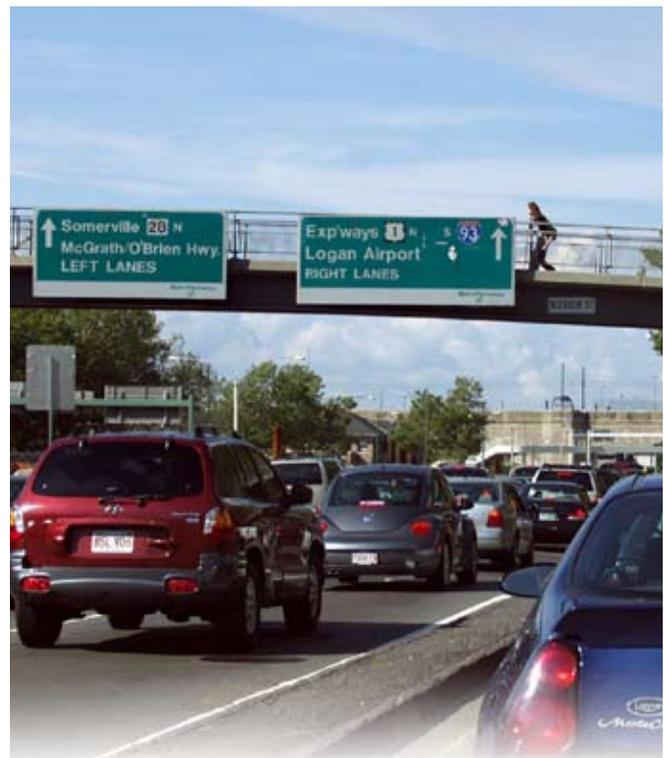
## SAFETEA-LU Requirements

Under SAFETEA-LU, MPOs are tasked with considering ways to increase the safety of the

transportation system for both motorized and nonmotorized users.

Also with the passage of SAFETEA-LU, a new core Highway Safety Improvement Program (HSIP) has been established with the goal of reducing highway fatalities. The aim is for HSIP to accomplish this by the reallocation of infrastructure safety funds and the implementation of a requirement for strategic highway safety planning. Additional programs will focus on motorcycle safety, improved traffic signs and pavement markings, pedestrian safety, the safety of children walking to school, work zone safety, and the safety of toll collectors and older drivers.

Under HSIP, states have the flexibility to target money to their most critical safety needs. Of the \$5.1 billion in HSIP funds designated nationwide for federal fiscal years 2006 to 2009, \$220 million per year is targeted for the Railway-Highway Crossings Program. The remainder is apportioned to the states based on lane-miles of federal-aid highways, vehicle-miles traveled on federal-aid highways, and the number of fatalities on federal-aid highways. Massachusetts HSIP



priorities will be taken from the Massachusetts Strategic Highway Safety Plan described below.

## Transportation Safety Planning

With the enactment of SAFETEA-LU, Transportation Safety Planning (TSP) was established. TSP is defined as a comprehensive, systemwide, multimodal, proactive process that integrates safety into surface transportation decision-making. TSP was formerly known as Safety Conscious Planning. A robust transportation-safety-planning program includes and integrates the “Four Es” of safety implementation: education, engineering, enforcement, and emergency services.

FHWA’s priority safety areas are lane departure crashes, intersections, and pedestrian safety. Lane departure crashes occur when one vehicle leaves its travel lane, resulting in a crash, such as a head-on crash, a vehicle crashing into a tree, or one vehicle sideswiping another vehicle traveling in the same direction. FTA’s priority safety areas touch on security along with safety, because it is difficult to completely separate the two. These priority safety areas are:

1. The identification of the top crime-prevention, safety, and security needs, the resolution of which the MPO may be asked to fund.
2. The creation of a National Transit Security Training Facility by the FTA and/or the U.S. Department of Homeland Security (USDHS). This facility will provide training to transit personnel in safety, security, and antiterrorist measures. The MPO may be asked to fund training for MBTA personnel at this national facility.
3. The coordination of safety and security roles and responsibilities between the USDHS and the USDOT. At the Massachusetts state level, this will be accomplished between the Executive Office of Public Safety and Security and the Executive Office of Transportation and Public Works (EOT). These roles will then be delegated to the MPO level, with the USDHS function arriving via the Regional Transit Security Working Group and the Metro Boston,

Northeast, Southeast, and Central Homeland Security Regional Planning and Advisory Councils.

These issues are also discussed in Chapter 8, Security.

## HIGHWAY SAFETY

### Strategic Highway Safety Plan

All states are required to implement a Strategic Highway Safety Plan (SHSP) that identifies and analyzes safety problems and opportunities. The Massachusetts SHSP (MSHSP), finalized by MassHighway and signed by the governor, was submitted to FHWA in September 2006. The Commonwealth can now use Highway Safety Improvement Program funds for newly eligible safety activities, such as Transportation Safety Planning, the collection and analysis of crash data, the integration of emergency communications equipment, and the implementation of work zone safety projects.

In Massachusetts, the lead agency for both oversight and funding of the MSHSP is MassHighway, under the overall authority of EOT. Other joint sponsors and participants in development and implementation include:

- FHWA
- Federal Motor Safety Carrier Administration
- Massachusetts Governor’s Highway Safety Bureau
- Massachusetts Registry of Motor Vehicles
- Massachusetts State Police
- Massachusetts Department of Public Health
- EOT’s Office of Transportation Planning
- Boston Region Metropolitan Planning Organization
- Massachusetts regional planning agencies, including the Metropolitan Area Planning Council (MAPC)

The first goal of the MSHSP is to reverse the increasing trend of traffic-related fatalities and injuries, with the eventual goal of zero traffic-related fatalities and injuries. The interim performance measurement for attainment of this goal is, by the year 2010, a 20 percent reduction, compared to 2004, in fatalities (from 476 fatalities to 381) and in injuries requiring hospitalization (from 5,554 to 4,443).

During the development process for MSHSP, six areas of emphasis were explored, and strategies for improving safety in each area were developed. The six strategies are:

#### 1. Data Systems Strategies

Data systems strategies emphasize educating public safety officials to promote greater use of standard forms, electronic submission and sharing software. This includes developing standard forms and online, database submission procedures for crash reports, citations, and trauma registration.

#### 2. Infrastructure Safety Strategies

Improving infrastructure safety begins with using criteria to identify high-crash locations and corridors and gathering data on safety deficiencies in order to expedite implementation of improvements. MassHighway Project Need Forms request information on safety deficiencies and MassHighway will provide design assistance as needed. Lane departure issues will be discussed with engineering, enforcement, emergency medical services, and education communities to develop regional and local programs to address this problem. MassHighway will undertake road safety audits, promoting the inclusion of basic safety elements into routine maintenance projects and work-zone safety practices.

#### 3. At-Risk Driver Behavior Strategies

Solutions for at-risk driver behavior issues focus on education and awareness. Strategies include public outreach regarding the instruc-

tion about, and value of, safety belt use (particularly as it pertains to child restraints) and low-speed driving habits. The State will support bilingual Drug Recognition Expert (DRE) programs to certify law enforcement personnel to make highly accurate assessments of persons who may be under the influence of drugs.



#### 4. Strategies for Higher-Risk Transportation System Users

As it does for most strategies, the State relies on greater awareness to improve careful driving among young drivers by assessing crash data from before and after adoption of the Massachusetts Junior Operator Law (JOL), educating teenagers about accident trends among this age group, and informing parents about the JOL, its regulations, and its consequences. The State proposes a similar approach for its older drivers, working both with the Healthy Aging Coalition to provide transportation-safety-related data, analysis, and information for the Coalition's strategic plan for healthy aging, and with the Massachusetts Council on Aging to inform older and disabled residents about safe mobility alterna-

tives available to them. To address pedestrian and bicyclist accidents, the State will work with local and regional authorities to identify high-crash locations, to encourage local implementation of the Safe Routes to School (SRTS) program, and to promote road-sharing and motorcycle education programs.

#### 5. Public Education and Media Strategies

The SHSP includes recommendations for public-education- and media-related strategies that will educate the public, legislators, and other opinion leaders to encourage safer behavior on Massachusetts roadways. The strategies discussed focus on raising the awareness of safety and the importance of crafting and delivering specific messages to targeted audiences.

#### 6. Safety Program Management Strategies

The SHSP proposes a management structure comprised of executive and advisory leadership committees to plan and implement the strategies mentioned above. The executive leadership committee is responsible for developing and executing a Memorandum of Understanding (MOU) detailing its members' commitment to safety planning, including identifying potential contributions to the safety planning process, and reviewing progress and updates on agency-specific safety initiatives during quarterly meetings. Members of the steering/advisory committee will be responsible for informing their respective agencies about current safety projects and for staying up-to-date on important safety initiatives through bimonthly meetings. These committees will work to develop detailed action plans and will report annually to the Secretary of Transportation, after which MassHighway will assess projects to monitor SHSP's effectiveness.

MassHighway is continuing to work with the stakeholders to develop action plans for strategy implementation. The MPO will support these emphasis areas in various ways, including by help-

ing to link data sets to provide useful information through the Mobility Management System and by submitting project need forms with completed safety data information through the Transportation Improvement Program.

### High-Crash Locations

One of the emphasis areas of the Massachusetts Strategic Highway Safety Plan is infrastructure, with a primary emphasis on intersection crashes and lane departure crashes. MassHighway has identified high-crash locations for these types of crashes and work at the local and regional levels to develop and implement location-specific strategies to mitigate the safety deficiencies identified.

### Intersection Crashes

Many fatal and incapacitating-injury-causing crashes are intersection-related. Crashes occurring at intersections are frequently evidence of congestion, stop-and-go traffic, or geometric or operational deficiencies at those intersections. High-crash intersections have been identified from the top-accident-locations findings and have been listed in the 2004 Congestion Management System report.

The MPO reviews this list in determining priorities for project funding. It is also used in Mobility Management System planning work to identify intersections that could benefit from improvements such as more flexible traffic signal design (vehicle-actuated traffic signals, traffic signal timing and phasing updates), the creation of safer pedestrian crossings, the institution of green phase traffic signal extensions for buses, and/or traffic signal preemption for emergency vehicles.

Table 7-1 shows the top 25 crash locations in the MPO area. This is a subset of a list of the top 1,000 crash locations in Massachusetts. The numbers in the table's "Weighted Average" column are a measure of crash consequence severity. In the calculation of this, fatalities are most heavily weighted, with a factor of 10; injuries have a factor of 5, and property damage a factor of 1.

**TABLE 7-1**  
**TOP 25 CRASH LOCATIONS IN THE MPO AREA, 1999–2001**

| MUNICIPALITY | CRASH LOCATION   | TOTAL<br>CRASHES | WEIGHTED<br>AVERAGE | RELEVANT PROJECT AND STATUS              |
|--------------|--|------------------|---------------------|--|
| SOMERVILLE   | ROUTE 28 (FELLSWAY) AT<br>ROUTE 38 (MYSTIC AVENUE)         | 544              | 1,413               | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| REVERE       | ROUTE 1 (CUTLER HIGHWAY) AT<br>ROUTE 60 (COPELAND CIRCLE)  | 463              | 1,324               | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| BOSTON       | I-93 (PULASKI SKYWAY) AT<br>MASSACHUSETTS AVENUE           | 501              | 1,257               | PART OF CENTRAL ARTERY/TUNNEL<br>PROJECT |
| READING      | I-95 AT I-93   | 560              | 1,208               | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| BOSTON       | ROUTE 3, LEVERETT CIRCLE                                   | 515              | 1,160               | PART OF CENTRAL ARTERY/TUNNEL<br>PROJECT |
| BOSTON       | I-90 (MASSPIKE) AT I-93                                    | 496              | 1,006               | PART OF CENTRAL ARTERY/TUNNEL<br>PROJECT |
| BURLINGTON   | ROUTES 3 AND 3A AT I-95                                    | 420              | 977                 |  |
| WALTHAM      | I-95 AT WINTER STREET                                      | 467              | 959                 |  |
| MEDFORD      | ROUTE 16 (MYSTIC VALLEY PARKWAY) AT<br>ROUTE 28 (FELLSWAY) | 372              | 936                 |  |
| SAUGUS       | ROUTE 1 AT ROUTE 129 (WALNUT STREET)                       | 328              | 888                 |  |
| BOSTON       | ROUTE 1 AT I-93  | 348              | 869                 | PART OF CENTRAL ARTERY/TUNNEL<br>PROJECT |
| WESTON       | I-90 (MASSPIKE) AT I-95                                    | 472              | 861                 |  |
| REVERE       | ROUTE 1A AT ROUTE 60 (BELL CIRCLE)                         | 329              | 853                 | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| BOSTON       | ROUTE 203 (GALLIVAN BOULEVARD) AT<br>NEPONSET AVENUE       | 343              | 851                 |  |
| WOBURN       | I-95 AT WASHINGTON STREET                                  | 336              | 792                 |  |
| BOSTON       | I-93 AT SOUTHAMPTON STREET                                 | 318              | 774                 |  |
| BRAINTREE    | I-93 AT ROUTE 37 (GRANITE STREET)                          | 272              | 748                 | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| MEDFORD      | I-93 AT ROUTE 28 (ROOSEVELT CIRCLE)                        | 317              | 738                 |  |
| BRAINTREE    | I-93 AT ROUTE 3 (BRAINTREE SPLIT)                          | 314              | 734                 | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| MEDFORD      | I-93 AT ROUTE 16 (MYSTIC VALLEY PARKWAY)                   | 301              | 733                 |  |
| CANTON       | I-93 AT I-95   | 297              | 733                 | PROJECT INCLUDED IN JOURNEY TO<br>2030   |
| WOBURN       | I-93 AT MONTVALE AVENUE                                    | 283              | 703                 |  |
| BOSTON       | I-93 AT DEWEY SQUARE TUNNEL                                | 278              | 694                 | PART OF CENTRAL ARTERY/TUNNEL<br>PROJECT |
| BELLINGHAM   | I-495 AT ROUTE 126 (HARTFORD AVENUE)                       | 373              | 681                 |  |
| WELLESLEY    | I-95 AT ROUTE 9 (WORCESTER STREET)                         | 289              | 669                 |  |

\* Weighted average based on crash severity (property damage, personal injuries, and fatalities).

## Lane Departure Crashes

Lane departure crashes account for many incapacitating injury-causing and fatal crashes. MassHighway and UMassSAFE (a multidisciplinary traffic safety research program housed at the University of Massachusetts) analyzed lane departure crashes and prepared a statewide fact sheet and fact sheets and maps for each of the state's regional planning agencies. The MPO uses this information in determining priorities for project funding.

## Highway Incident Management with Intelligent Transportation Systems

Intelligent transportation systems (ITS) is the application of technology to improve the operation of the transportation network for users of all modes. ITS technology includes computers, electronic sensors, communications, and other systems to reduce congestion, respond to incidents, and improve safety and mobility. At the core of this process in the MPO region is the Regional ITS Architecture for Metropolitan Boston, which guides the coordination and integration of individual ITS deployment projects.

A common example of an ITS application is a variable-message sign, either permanent or portable, warning motorists of crashes, delays, or approaching inclement weather ahead.

Traffic incident management in Massachusetts is the responsibility of MassHighway and is coordinated from its Traffic Operations Center (MTOC). The MTOC is the "nerve center" for the application of ITS programs throughout the Commonwealth. From the MTOC, reports on traffic incidents are relayed to the involved MassHighway district office, which, in turn, assigns the necessary personnel and equipment required to address the incident. The MTOC also coordinates with the Boston Transportation Department's Traffic Management Center (the operation of which is funded by the Boston Region MPO in the Transportation Improvement Program for federal fiscal years 2007 and 2008), the City of Boston's Emergency



Operations Center, and Central Artery/Tunnel Project's Operations Control Center.

## Highway Safety Patrols

The term "highway safety patrols" traditionally refers to state troopers patrolling state highways. The Massachusetts State Police enforce traffic law and provide security on the Massachusetts Turnpike and the interstate highways in the region. Massachusetts State Police troopers provide security through a variety of techniques, including, but not limited to, routine patrol using marked and unmarked cruisers, helicopter overflights, tollbooth surveillance, and crash and criminal investigations.

In Massachusetts, "highway safety patrols" also refers to MassHighway's CaresVan program. Specially equipped vehicles patrol four different routes along 332 miles of interstate and other express highways in the Boston region to aid motorists with disabled vehicles. The routes include Route 128, I-93, I-95, and I-495.

## Traffic Calming

Traffic calming includes an array of engineering strategies to increase safety, reduce vehicle speeds, and improve livability. Engineering mea-



sures can be used to compel vehicle operators to slow down and to alter their behavior in other ways. Traffic-calming strategies include traffic management techniques such as changes in traffic routes, changes in the street network alignment within a neighborhood, and the installation of traffic circles, barriers, speed bumps, raised crosswalks, and other physical measures to reduce traffic speeds and volumes on residential side streets. Traffic-calming strategies are encouraged in MassHighway's Project Development and Design Guide, described later in this chapter.

## TRANSIT SAFETY

Due to the intertwined nature of safety and security on transit systems, many safety initiatives of the MBTA and Cape Ann Transportation Authority (CATA) also have a security aspect to them. The reverse relationship is, of course, true as well. Security cameras, as an example, could also be called safety cameras, because they provide for the well being of patrons who may have slipped and fallen in an isolated area of a train station, as well as provide security from a would-be assailant or terrorist on a train platform or a bus.

## MBTA Police Department

The MBTA Police Department's primary mission is to maintain safety within the MBTA transit system. The department's approximately 250 uniformed and plainclothes police officers accomplish this through mobile, foot, and canine patrol teams on both scheduled and random patrols, all of which serve to maintain a high degree of visibility within the system. The Blue, Green, Orange, and Red Lines are served by 115 police officers, 4 police substations, and 15 police kiosks, while additional surface patrols provide support to buses and commuter rail.

The three primary components of the department's safety operations are:

- Community Policing Patrol Plan
- Investigation and prosecution (arrests and trials)
- Police/community relations (public outreach)

## MBTA Safety Department

The primary role of the MBTA Safety Department is to ensure the safety of the MBTA's employees, its customers, and members of the general public throughout the MBTA system. In order to accomplish this, the MBTA Safety Department designs, implements, supports, and monitors safe work practices for and among its employees, whether they are working in MBTA vehicles and facilities or on MBTA property and rights-of-way. These safe practices are outlined in the MBTA's System Safety Program Plan and in its Safety Policies and Procedures Manual.

Examples of the types of activities conducted by the MBTA Safety Department include:

- Right-of-way safety training
- Tracking accidents
- Operation Lifesaver
- Safety audits
- Safety hazard correction
- Safety drills

## Communications Interoperability

One of the issues facing the MBTA in its emergency-response planning is that of interoperability. Interoperability is defined as the ability of radio equipment belonging to one organization's first responders in an emergency to communicate with that of another organization's first responders. Currently, radio coverage inside MBTA subway system tunnels does not meet these operational standards. This affects the response capabilities of not only the Boston and Cambridge fire departments, but both cities' police departments, emergency medical services, and the MBTA Police Department. Interoperability affects nearly every community in the commonwealth. The MBTA is working with other members of the State Interoperability Committee to explore this issue and develop ways to improve radio communications.

## MBTA Surveillance Cameras

The MBTA will increase the number of surveillance cameras on the rapid transit system by 186, bringing the total number operating in the rapid transit system to 488. This will provide a security camera in every rapid transit station in the entire system. The MBTA surveillance cameras are monitored from a number of different locations, including the MBTA Operations Control Center, the MBTA Police Department, and the Massachusetts Emergency Operations Center in Framingham.

In addition, the MBTA has embarked upon a program of installing surveillance cameras in new buses. There is also a strong surveillance component to the MBTA's Station Management Program, which includes the Automated Fare-Collection System Project, the Hub Stations Project, and the Wide Area Network Project. The Hub Stations and Wide Area Network Projects' surveillance components consist of closed-circuit television cameras and the fiber-optic cable required to connect them to their monitors.

## Grade Crossing Redesign

Improving grade crossing safety has long been one of the top priorities of the Federal Railroad

Administration. From 1995 to 2004, the number of grade crossing collisions in the U.S. declined by 3 percent, the frequency of such collisions per million train miles decreased by 42 percent, and the number of fatalities fell by 36 percent. During the first 11 months of 2005, grade crossing collisions were down 5.1 percent, and fatalities declined 5.3 percent compared to the same period of 2004. In Massachusetts, funding exists under the Section 130 Program of MGL Chapter 160 for the upgrading and improving of railroad crossings.



## Advance Warning Techniques

The Commonwealth of Massachusetts, the MBTA, and a majority of those in the railroad industry agree that the use of locomotive horns helps to promote safety at highway-rail grade crossings. Although Massachusetts law requires trains to blow their horns at highway-rail grade crossings, horn bans have been created by the legislature in many communities. The MBTA complies with these bans within those communities. In August 2006, the Federal Railroad Administration amended the June 2005 locomotive horn rule to

create six different quiet-zone categories. These quiet zones, within which each grade crossing must have flashing lights and gates, are defined in conjunction with state agencies and railroads.

Meanwhile, the MBTA has taken steps to improve safety at its 200 public highway-rail grade crossings. Included among these steps is an investment in automatic warning systems, such as crossing gates, flashing lights, and warning bells, to be installed on almost all of the public grade crossings used by the MBTA.

### Operation Lifesaver

Operation Lifesaver is an educational program created to stop deaths, injuries, and crashes at railroad grade crossings and along railroad rights-of-way. Crashes between trains and trucks are especially harmful, as they typically result in many casualties. Much of the hazardous material transported in the U. S. is moved by truck: the reduction of grade crossing collisions with trucks is especially important.

Operation Lifesaver Inc., an international, nonprofit organization, was established in 1972 to conduct this program. The program is a joint venture of U.S. railroads, highway safety agencies and organizations, and local, state, and federal government public safety agencies. In Massachusetts, as in all other states, certified volunteer speakers conduct free railroad safety briefings for people of all ages in order to assist them in making the proper decisions when around railroad tracks.

### Cape Ann Transportation Authority

The Cape Ann Transportation Authority (CATA) provides bus and paratransit services to the Boston Region MPO communities of Gloucester, Essex, Ipswich, and Rockport. CATA is implementing the following safety measures:

- All drivers receive safety training; a safety trainer is on staff.
- Passenger safety information providing guidance for passengers on being safe while



waiting for and onboard the vehicles is provided on its Web site and in printed materials distributed on vehicles.

- Buses and paratransit vehicles will be equipped with automatic vehicle locators that will relay location information to a central dispatcher.

### AIR SAFETY

At Massport's Logan International Airport in Boston, the increased police presence at the airport due to security provisions also enhances the environment for public safety. The primary provider of this security-enhanced public safety is Troop F of the Massachusetts State Police.

### BICYCLE AND PEDESTRIAN SAFETY

Safety is given first place in the list of considerations in the Massachusetts Highway Department's Project Development and Design Guide. The Design Guide states that the roadway system should "safely accommodate all users," including bicyclists and pedestrians and those using mobility aids. In calling for consideration of all modes in



the design and construction process, the Design Guide is providing for the growth of a safe and multimodal transportation network. It also provides design parameters to be used when constructing shared-use paths.

A well-designed shared use path provides safety to its users by creating a separate path away from motor vehicles, minimizing the number of street and driveways that must be crossed, and providing safe crossings of those streets and driveways that cannot be avoided. In addition, a

well-designed trail also offers and promotes safety when integrated with other pedestrian and bicycle facilities, and highly-used places, such as public transit stations, parking lots, parks, schools, and employment and commercial areas.

The most important considerations for safe bicycle use on roadways include width, sight distance, and speed. The width should be enough, for example, to allow motor vehicles to pass bicyclists safely and to allow bicyclists to pass parked vehicles without being so close as to collide with a suddenly opening car door.

The major facilities for pedestrians traveling on the roadway system are sidewalks and crossings. A safe sidewalk protects pedestrians from moving vehicles, through either distance or barriers. Crossings need to be visible, both in terms of sight distance and in terms of being well marked.

Bicycle and pedestrian crashes are reported in the Massachusetts Registry of Motor Vehicles database. Table 7-2 shows the number of crashes from 1995 through 2001 in the Boston MPO region.

### Safe Routes to School Program

Another provision of SAFETEA-LU is the Safe Routes to School Program. Funds for this program are provided through FHWA. EOT administers the Safe Routes to School program in Massachusetts through its statewide travel-options

**TABLE 7-2**

**NUMBER OF BICYCLE AND PEDESTRIAN CRASHES IN THE BOSTON MPO AREA, 1995–2001**

| YEAR | PEDESTRIAN CRASHES |            |          | BICYCLE CRASHES |            |          |
|------|--------------------|------------|----------|-----------------|------------|----------|
|      | TOTAL              | FATALITIES | INJURIES | TOTAL           | FATALITIES | INJURIES |
| 1995 | 1,722              | 46         | 1,615    | 895             | 3          | 774      |
| 1996 | 1,775              | 35         | 1,681    | 848             | 3          | 748      |
| 1997 | 1,790              | 40         | 1,683    | 817             | 3          | 742      |
| 1998 | 1,726              | 32         | 1,676    | 856             | 1          | 742      |
| 1999 | 1,594              | 34         | 1,554    | 655             | 2          | 581      |
| 2000 | 1,640              | 38         | 1,636    | 710             | 3          | 690      |
| 2001 | 1,446              | 33         | 1,360    | 571             | 6          | 481      |

program, *MassRIDES*. The goal of the program is to improve walking and bicycling conditions for children traveling to school, through the program's "Five Es": education, encouragement, enforcement, engineering, and evaluation. A focus is placed on educating elementary school students, parents, and community members on the value of walking, bicycling, carpooling, using public transit, and taking school buses to and from school. The program also aims to increase physical activity and safety and decrease traffic congestion and air pollution. For more information on Safe Routes to Schools, see Chapter 6.

## FREIGHT SAFETY

Freight safety is an important issue due to the potential for great human and property losses in the event of an incident. Some of the issues for truck freight safety also pertain to highway safety in general and were discussed earlier in more depth. They are:

- Roadway design improvements
- Identification and mitigation of high-crash locations
- Railroad/highway grade crossings
- Lane departure crashes

Other issues discussed below that pertain to the trucking freight industry are the roles of associations and regulators, hours-of-service rules, and hazardous-materials transport.

The rail freight safety issues that are common to rail transit were addressed earlier in this chapter, and others are discussed below.

Some improvements to freight safety will also improve safety for other users of the transportation system. For example, the Commonwealth's policy that new and reconstructed bridges over rail lines be designed to accommodate double-stack rail cars, as well as the inclusion of the East Boston Haul Road in JOURNEY to 2030, will help to reduce the number of trucks on the roadway system in the MPO area.



## Truck

### Roles of Trucking Industry Associations and Government Regulators

Much of the safety advocacy for the truck freight mode comes from the industry's various trade associations and government regulators, as discussed below.

#### *Federal Motor Carrier Safety Administration*

The Federal Motor Carrier Safety Administration (FMCSA), a division of FHWA, promulgates regulations governing the trucking industry. The FMCSA established the Motor Carrier Safety Advisory Committee, with 15 members appointed to the Committee in March 2007. This committee will advise and make recommendations to the FMCSA on safety programs and improvements, safety regulations, roadway design, dedicated truck lanes, and other safety issues of interest to the trucking industry.

## Massachusetts Motor Transportation Association

The Massachusetts Motor Transportation Association is a nonprofit trade association that advocates for improvement to roadway design, promotes safety improvements for both highways and trucks, advocates for the creation of dedicated truck lanes, and serves the trucking industry in other ways as well.

## Other Trucking Associations

The Regional Truck Council, the American Transportation Research Institute (formerly the American Trucking Research Institute), the American Trucking Foundation, and the American Trucking Association are some of the major trucking associations of which MPO region trucking firms are members. It is through these organizations that trucking concerns lobby local, state, and federal government agencies concerning highway improvements and other safety amenities and issues.

## Hazardous-Materials Movement

Federal and state hazardous-materials regulations<sup>1</sup> restrict the movement of hazardous materials through highway tunnel structures. This affects many of the interstate highways in downtown Boston, including:

- I-90 Ted Williams Tunnel, traveling under Boston Harbor
- Central Artery
- Massachusetts Turnpike Extension under the Prudential building and Copley Square
- Tobin Bridge approach under City Square in Charlestown
- Sumner Tunnel
- Callahan Tunnel

This law is rigorously enforced by the Massachusetts State Police.

## Hours-of-Service Rules

The Commonwealth of Massachusetts is in compliance with the hours-of-service (HOS) regulations promulgated by the FMCSA, which have the goal of improving safety by requiring periods of rest for long-haul drivers. The current HOS regulations took effect on October 1, 2005. Both the old and new regulations allow 11 continuous hours of driving after 10 continuous hours off duty. However, the new regulations require commercial motor vehicle drivers that use the sleeper berth provision to spend at least eight consecutive hours in their sleeper berth, plus two consecutive hours either in the sleeper berth, off duty, or any combination of the two. Under the old regulations, drivers were allowed to split their sleeper berth time into two-hour segments. The Massachusetts State Police enforce these rules in the Commonwealth.

## Rail

### Railroad Industry Associations and Government Regulators

Much of the safety advocacy for the railroad freight industry comes from its various trade



<sup>1</sup> Hazardous materials regulations: Title 49 of the Code of Federal Regulations (CFR), Section 397.6 and 397.9, Massachusetts General Law (MGL), Chapter 81A, and Massachusetts Code of Regulations (MRC), Title 730, Chapter 7.10 (1).

associations and government regulators, as discussed below.

### **Federal Railroad Administration**

The USDOT's Federal Railroad Administration acts as both a regulator and a safety advocate for the railroad industry. It is responsible for:

- Rail safety regulations and enforcement
- Administration of railroad assistance programs
- Setting railroad safety policy
- Rehabilitation of Northeast Corridor passenger service
- Supporting intermodal transportation

### **Massachusetts Railroad Association**

The Massachusetts Railroad Association is an organization of railroad companies operating in Massachusetts. Its stated goals are to share information and foster understanding of railroads' role in the safe and efficient movement of goods and people throughout the commonwealth.

Membership in the association includes:

- Bay Colony Railroad
- CSX
- Fore River Transportation
- Housatonic Railroad
- Massachusetts Central Railroad
- New England Central Railroad
- Pan Am Railways
- Pioneer Valley Railroad
- Providence and Worcester Railroad

### **Other Railroad Associations**

The New England Railroad Club, the Association of American Railroads, the North American Rail Shippers Association, and the American Short Line and Regional Railroad Association are some of the other major railroad associations serving members of the MPO area. It is through these organizations that railroads lobby local, state, and federal government concerning railroad issues, including those related to safety.

### **Moving Hazardous Materials**

The Hazardous Waste Common Carrier Agreement<sup>2</sup> requires railroads, including those operating in Massachusetts, to provide for the transport of hazardous waste or other dangerous cargo, up to and including radioactive nuclear waste, even if it is to pass through heavily populated urban areas. A large portion of the hazardous materials transported in the U.S. travels by rail, because, while not without risk, this mode is safer than transport over the roadways by truck. This law ensures that rail operators do not refuse hazardous materials for transport, in spite of the danger to the railroads and the areas through which hazardous materials pass.

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<sup>2</sup> The Hazardous Waste Common Carrier Agreement, a combination of rules and regulations created by the Interstate Commerce Commission (ICC) (now the Surface Transportation Board (STB)), the USDOT, the Nuclear Regulatory Commission (NRC), common law, and other sources (all of which are based on the "common carrier obligation" outlined in U.S. Code, Title 49, Subtitle IV, Part A, Chapter 111, Subchapter I, Section 11101 (a) Common Carrier Transportation, Service, and Rates) states that a railroad may not deny service to any customer or fail to "...respond to reasonable requests for common carrier service..."