

CHAPTER 11

Federal Safety Initiatives

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Introduction

Chapter 5 of this report presents a variety of safety statistics for both the Nation's highways and public transportation systems. This chapter describes various initiatives that have been undertaken by the U.S. Department of Transportation (DOT) to address safety performance issues. This chapter is broken down into separate sections describing programs of the Federal Highway Administration (FHWA), National Highway Traffic Safety Administration (NHTSA), the Federal Motor Carrier Safety Administration (FMCSA), and the Federal Transit Administration (FTA). While these distinctions are useful from a chapter-organizational perspective, it is important to recognize that these individual agencies actively cooperate with each other (as well as with other agencies such as the Federal Railroad Administration [FRA]) on many of the highway and transit initiatives described in the chapter.

Highway Safety Programs: Federal Highway Administration

Safety remains the U.S. Department of Transportation's highest priority. The Department has established a goal to reduce the national highway fatality rate from the 2002 level of 1.5 deaths per 100 million vehicle miles traveled to 1.0 per million vehicle miles traveled by the year 2008. The 1.0 goal was exceeded by 13,734 fatalities in 2002.

In announcing this goal to reduce fatalities, it must be made clear that there is no one silver bullet that will drive down the fatality rate. Major improvements in highway safety require a comprehensive and coordinated approach that addresses driver behavior, vehicle design, and the roadway. A successful comprehensive approach to safety also requires a wide variety of partnerships with State departments of transportation; other Federal, State, and local agencies; and the private sector.

Many of the safety-related activities currently being carried out by DOT are a result of a national Strategic Highway Safety Plan that was developed by the American Association of State Highway and Transportation Officials (AASHTO) with the assistance of FHWA; NHTSA; the Transportation Research Board (TRB), and experts from private sector safety and transportation organizations, industry, and academia. This comprehensive plan includes 22 emphasis areas and 90 strategies to improve driver behavior, vehicle design, roadway safety, emergency medical services, and pedestrian and bicycle safety. To implement the plan, 30 "lead States" are testing new tools and guides developed by the National Cooperative Highway Research Program (NCHRP) to help States improve their highway safety planning and programs.

Roadway Safety

The FHWA has the overall lead in improving the safety of the Nation's roadway infrastructure. The agency has identified safety as its highest priority among the "vital few" focus areas targeted for greater attention and resources. As part of a comprehensive approach to safety, the FHWA partners with a variety of organizations that are interested in improving roadway safety, including AASHTO, individual State departments of transportation, the Governors' Highway Safety Association (GHSA), the National Association of County Engineers (NACE), the International Association of Chiefs of Police (IACP), the American Traffic Safety Service Association (ATSSA), the Institute of Transportation Engineers (ITE), the American Road and Transportation Builders Association (ARTBA), the American Public Works Association (APWA), the Transportation Research Board (TRB), the National Association of Regional Councils (NARC), the Association of Metropolitan Planning Organizations (AMPO), and the National Utility Contractors Association (NUCA).

The FHWA Office of Safety has recently launched an approach to safety that better focuses resources and more effectively supports activities that will achieve the aggressive goal of FHWA and DOT to reduce the fatality rate from 1.5 to 1.0 fatalities per 100 million vehicle miles traveled by 2008. As part of the "focused" approach to safety, 16 States have been identified as having the greatest opportunity to contribute to reducing the national fatality toll. These States, known as "opportunity" States, are in the top half of States in terms of overall fatality numbers, and have either a fatality rate above the national average or a

fatality rate improvement trend below the national average. In addition, FHWA identified “focus” States that have fatality rates above the national average and fatalities above a number threshold value for each of the emphasis areas related to the highest number of fatalities nationwide—intersection, roadway departure, and pedestrian crashes.

Attention to “opportunity” and “focus” States does not mean that other States will be “left out in the cold.” The FHWA will continue to support safety activities in every State across the country, particularly those developing and implementing a comprehensive highway safety plan. All States need to take a data-driven approach to identifying their specific safety problems and goals, identifying and implementing appropriate countermeasures, and aggressively advancing safety. The FHWA will continue to be an important partner with the States, as well as other agencies and organizations, in these activities.

The FHWA takes a comprehensive approach to Safety by including the 4 E’s (Engineering, Enforcement, Education and Emergency Services) in its program activities. FHWA Office of Safety, in supporting the national AASHTO Strategic Highway Safety Plan, has also concentrated on providing direct assistance to states in helping them develop state comprehensive highway safety plans. Over 30 states are participating in the development of safety plans with the target for all states to have plans by FY06.

The FHWA’s safety programs focus on engineering-related improvements to the roadway that have proven effective in reducing the potential for crashes and the severity of crashes when they occur. They target three types of crashes linked to high numbers of fatalities: roadway departure crashes (24,412 or 59 percent of all traffic fatalities in 2002), intersection crashes (9,273 or 21 percent of fatalities), and pedestrian-related crashes (4,851 or 11 percent of fatalities). Many crashes involve multiple factors related to the roadway, the driver, and the vehicle. For example, an intersection crash may involve other vehicles, a young driver, and a pedestrian. A number of strategies are needed and currently available to reduce these types of crashes, including low-cost improvements such as illumination, signing, pavement marking and delineation, traffic signal upgrading, and the installation of rumble strips.

To assist States and localities in implementing roadway safety improvements, FHWA administers the Hazard Elimination Program, which makes funds available to States and localities for safety projects to reduce the number and severity of crashes at hazardous highway locations, sections and elements on any public road,

at public railway-highway crossings, any public surface transportation facility, or any publicly owned bicycle or pedestrian pathway or trail. In addition to the low-cost improvements noted above, projects implemented with Hazard Elimination Program funds include intersection improvements (e.g., channelization, new traffic signals, and sight distance improvements), pavement and shoulder widening, the installation and upgrading of guardrail and median barriers and breakaway utility poles and sign supports, pavement grooving and skid-resistant overlays, modification of roadway alignment, and pedestrian-related improvements. The FHWA also administers the Highway-Rail Grade Crossings Program that is intended to reduce the number and severity of train collisions with vehicles and pedestrians. All public crossing safety improvements

Q. How effective are roadway safety improvements in reducing crashes?

A. Roadway safety improvement projects continue to show benefits. To illustrate, South Carolina installed nearly 400 miles of median barrier on its Interstate system in an effort to reduce the potential for median crossover crashes. Using multiple sources of funds, including Federal-aid, State and local, and private sector funds, these improvements were implemented over a 2-year period. The cable median barrier that was installed reduced the number of fatal Interstate median crossover crashes by 67 percent. Overall, South Carolina’s Interstate Safety Improvement Program resulted in a savings of approximately \$375 million over 2 years and a benefit-cost ratio of nearly 20 to 1.

are eligible for Federal funding. Typical projects include the installation and upgrading of active warning devices (e.g., lights and gates), the installation of signs and markings, sight distance improvements, grade separations, and the elimination of crossings.

Funding for safety improvements is not restricted to the Hazard Elimination and Highway-Rail Grade Crossings Programs. They can also be funded from the larger Federal-aid programs such as the Surface Transportation Program, the National Highway System, and Interstate Maintenance at the State's option.

To ensure that these improvements are carried out in an organized, systematic manner where the greatest benefits can be achieved, States are required to develop and implement, on a continuous basis, a highway safety improvement program (HSIP) that has the overall objective of reducing the number and severity of crashes and decreasing the potential for crashes on all highways. Under the HSIP, the States utilize data to identify hazardous locations and elements, conduct engineering studies, and establish project priorities. The States have considerable flexibility to carry out HSIPs that will best meet their needs.

The FHWA's program of nationally coordinated research and technology safety innovations is dedicated to reducing highway crashes and related fatalities and injuries. The FHWA's Safety R&D Program focuses on priority highway safety improvement objectives related to roadway departure prevention and mitigation, safety management, intersection improvement, and pedestrian protection. This includes providing transportation officials and practitioners with improved understanding, information, and state-of-the-art tools so that they can make informed decisions about highway safety improvements. The FHWA's Safety R&D Program also conducts advanced research to determine new ways to solve highway safety problems and challenges.

The FHWA's Safety R&D Program includes:

- Conducting research to evaluate and improve the safety designs of highway geometry, roadway elements, and traffic control devices;
- Improving understanding of the dynamics of run-off-the-road (ROR) crashes and identifying means to reduce the number of fatalities and serious injuries resulting from these types of crashes through crash tests and simulations to improve crash barriers and other roadside hardware, and to reduce the incidence and severity of rollover crashes;
- Using data to identify the nature and magnitude of safety problems, develop analytical tools, and evaluate the effectiveness of various safety treatments; and
- Conducting studies and research to assess human performance and behavior under various roadway conditions.

Other agency research efforts include speed management to encourage wider adoption of safe travel speeds appropriate for road and travel conditions, safety management to ensure that resources are allocated to achieve the maximum returns in reducing the number and severity of crashes, work zone safety improvements, and human-centered systems to incorporate human factors into highway design. The FHWA offers human factors workshops for highway design engineers and traffic safety specialists. The workshops emphasize the relationship between highway standards and human needs and provide an opportunity to apply human factors principles to resolve highway design, operations, and safety issues. Seventy human factors workshops have been offered throughout the country in the last 4 years.

The following program descriptions provide examples of the types of strategies and tools used by FHWA to reduce roadway departure, intersection, and pedestrian fatalities.

Reducing Roadway Departure Crashes

Roadway departure crashes, which include ROR, head-on, and opposite direction sideswipe crashes, are a very serious problem. Of the 43,005 total fatalities in 2002, 25,241 fatalities, or almost 59 percent, were from roadway departure crashes. ROR crashes resulted in 17,046 fatalities or 40 percent of all fatalities. This represents a 10.3 percent increase in ROR fatalities since 1995 when there were 15,456 fatalities (comprising 33 percent of all fatalities). Fatalities from head-on and opposite direction sideswipe crashes totaled 8,195 or 19 percent of all fatalities in 2002. Seventy percent of ROR fatalities occur in rural areas, with about 90 percent of these occurring on two-lane roads. The FHWA's 5-year goal is to reduce overall roadway departure fatalities by 10 percent by the year 2007. This goal includes ROR, head-on, and opposite direction sideswipe crashes. Excessive or inappropriate speed for highway conditions is a factor in approximately 30 percent of all fatalities each year. The FHWA's role in assisting States to develop effective speed management programs will be described later in the chapter.

The FHWA is actively pursuing improved roadway safety through a multifaceted approach in the fields of engineering, education, and enforcement. As part of its comprehensive safety program, FHWA engineers work closely with state highway engineers and law enforcement officials to identify appropriate engineering safety countermeasures for high-risk locations and new roads. The FHWA promotes effective engineering solutions such as removing and relocating objects in hazardous locations, flattening severe horizontal curves, eliminating pavement edge/shoulder drop-offs, and paving and widening shoulders. The FHWA, a partner with the Georgia Department of Transportation in developing methods of constructing pavement edges on new paving projects called "Safety Edge," is promoting improving shoulders with such treatments to reduce the effect of pavement drop-offs. When a vehicle tire drops off the edge of the road, many drivers over-react by braking hard and trying to turn sharply back onto the roadway. This action frequently leads to loss of vehicle control and subsequent rollover.

Designing Safer Roadways

The FHWA researches, develops, and promotes a variety of design features that create safer roadways to prevent roadway departures. The focus is on two approaches: (1) "Keeping the vehicle on the road" and (2) "Minimizing the consequences if the driver leaves the road." The FHWA and representatives from seven State departments of transportation are working in partnership to develop the Interactive Highway Safety Design Model (IHSDM), an interactive and innovative road safety evaluation software that is being developed for use by roadway designers. A training course was developed to teach engineers and planners to use IHSDM to evaluate the safety of highway geometry when they design and redesign roadways.

Protecting Drowsy Drivers

Drowsiness and inattention contribute to roadway departure crashes. Rumble strips, particularly the milled type, that provide an audible warning to inattentive drivers and create a physical vibration, are an extremely effective way to prevent roadway departures on freeways and other selected roadways. They are also used along the highway centerline on two-lane facilities in several States to reduce head-on collisions. The FHWA is spearheading a movement to increase nationwide use of milled rumble strips and has issued a technical advisory on rumble strips to encourage uniform application of this safety countermeasure on a national basis.

More Visible Signs and Pavement Markings

Greater visibility of roadway markings and signs are also an important method of preventing roadway departure crashes. While only 25 percent of travel occurs at night, about half of traffic fatalities occur during hours of darkness. During the daylight hours, drivers have a number of visual cues, such as shoulders, roadside vegetation, guardrails, and fences to make navigation easier. At night, many of these cues cannot be seen unless they are illuminated or retroreflective. Adequately maintained retroreflective signs and pavement markings have better nighttime visibility and help motorists stay safely on the road. The FHWA is using innovative retroreflectivity technology to efficiently measure the nighttime visibility of signs and pavement markings and has developed proposed national guidelines for minimum sign retroreflectivity levels for use by State and local highway agencies.

The “Forgiving Roadside”

The FHWA’s “forgiving roadside” approach encourages development and use of roadway design features that help to reduce the severity of a crash when a motorist leaves the roadway. Crashworthy roadside hardware, including modern traffic barriers and terminals, crash cushions, bridge railings, and work zone devices, are all designed and tested to minimize the impact of a crash. In addition, a cadre of FHWA engineers provides roadside design training to highway agencies on request. This training is also provided in a formal National Highway Institute course covering the information contained in the *Roadside Design Guide*, an AASHTO publication (www.transportation.org) recognized as the best source of information on roadside design.

Context-Sensitive Safety Design

There are many factors that must be considered when planning and designing streets and highways. While the principal goal is to provide a safe and efficient facility for moving people and goods, the character of the highway often must meet aesthetic and historical needs of the community as well. To safely accommodate landscaping, community signage, and other context-sensitive features, the Office of Safety works with the Office of Environment & Planning and the Office of Infrastructure to present a consistent design policy to the field and the State departments of transportation. The Office of Safety develops crashworthy aesthetic treatments such as traffic barriers and raised islands for trees, develops educational material such as training courses and videos, and is actively involved in the AASHTO Strategic Highway Plan efforts to reduce the deaths and injuries caused by trees in hazardous locations. The FHWA also participates in National Cooperative Highway Research Program (NCHRP) Project 16-04, *Design Guidelines for Safe and Aesthetic Roadside Treatments in Urban Areas*, that is intended to produce designs for aesthetic treatments for streets and highways in urban areas that will not degrade safety.

Safety Partnerships with Law Enforcement for Better Crash Data

Safety partnerships with State and local law enforcement and accurate crash data are very important to preventing roadway departures and other fatal crashes. Both are important features of *Safety Starts With Crash Data*. The FHWA co-produced this video to help train law enforcement personnel to thoroughly investigate crashes and submit accurate, complete, and timely crash reports. Distributed to law enforcement agencies throughout the country, this video is the product of an FHWA partnership with the IACP; the National Sheriffs Association; and two federal sister agencies, NHTSA and FMCSA.

Improving Intersection Safety

Intersection safety is a serious, national public health issue. In 2002, there were almost 3 million intersection crashes, comprising over 40 percent of all reported crashes for that year. In 2002, 9,273 fatalities were intersection-related – accounting for 22 percent of the 43,005 traffic fatalities. The FHWA's Office of Safety is engaged in several initiatives to work toward lowering the national fatality rate to 1.0 per 100 million vehicle miles traveled by improving the public's safety at intersections. The Office of Safety's pedestrian safety programs are closely linked to improvements in intersection safety. The contributions of these programs to intersection and pedestrian safety will be described later in the chapter.

National Agenda for Intersection Safety

The FHWA is actively pursuing improved intersection safety through a multidisciplinary approach in the fields of engineering, education, and enforcement in coordination with State and local police and fire agencies. The FHWA has worked with industry partners to develop a National Agenda for Intersection Safety—a multi-pronged approach toward improving intersection safety. There are 11 categories of solutions and strategies in this national plan, including engineering and technology improvements, intersection safety audits, red light running, training for local safety professionals, and increasing public awareness.

Stop Red Light Running

The FHWA continues its participation in the “Stop Red Light Running” Campaign—a national safety partnership dedicated to improving intersection safety through the reduction of red light running. The American Trauma Society has been a partner with FHWA since 1998. Currently, over 200 communities, including local law enforcement, are part of this nationwide effort to reduce red light running at intersections. The FHWA developed guidance for the use of red light running cameras and a practitioner’s guide, *Engineering Safe Intersections to Prevent Red Light Running*.

Resources on Intersections and Roundabouts

The FHWA has recently developed a training course on intersection safety. This course provides local practitioners with training on conventional and nonconventional engineering treatments to improve safety at their intersections. The FHWA recently published an informational guide on the design and application of roundabouts (circular intersections). Roundabouts have fewer conflict points than traditional intersections so their potential to improve safety is great, if well designed. The FHWA is in the process of publishing a guidebook on signalized intersections.

Its Office of Safety Web site (<http://safety.fhwa.dot.gov>) and Intersection Safety Resource CD-ROMs are being used to put many guidebooks and resources into the hands of practitioners.

Intelligent Technology for Intersections

The FHWA is also looking to intelligent technology to improve intersection safety. The Intersection Collision Avoidance System is being developed to help drivers avoid crashes at intersections. In partnership with automotive manufacturers and State and local departments of transportation, this initiative will pursue optimized vehicle-roadway communication systems designed to address the full set of intersection crash problems. Some examples include crashes related to violations of traffic signals and stop signs. The goal is to develop commercially deployable intersection collision avoidance systems.

Q. Are there other ways intelligent transportation system (ITS) technology can be used to improve intersection safety?

A. Yes, the Kentucky Transportation Cabinet is testing another ITS application. The Cabinet teamed with the Louisville Metro Public Works to deploy TRIMARC Intelligent Transportation System, an innovative use of ITS technology to help traffic safety engineers. TRIMARC is the regional transportation management system for the Louisville-Southern Indiana area. It is managed jointly by the Kentucky Transportation Cabinet, the Indiana Department of Transportation, and the FHWA. TRIMARC includes two cameras with directional microphones, a VCR, and a central controller installed on opposite corners of an intersection. The equipment provides frame-by-frame analysis that enables the engineer to determine the speed and angles of impact vital to accident reconstruction. It also provides the actual sights and sounds just before a crash or near miss in a video of the incident and the results. Engineers use this information to develop quantitative data as a basis for effective intersection safety improvements.

Highway-Rail Grade Crossing Safety Activities

A special type of intersection is one where a highway crosses a railroad track, known as a highway-rail grade crossing. The number of incidents at public highway-rail grade crossings has been reduced by approximately 75 percent since 1975. The FHWA's Office of Safety is designated to manage the Railway-Highway Crossings Program (as directed by 23 U.S.C. 130). The FHWA, in close coordination with the Federal Railroad Administration (FRA) and the Federal Transit Administration (FTA), is involved with activities to further reduce the number of incidents at public grade crossings. Some activities related to highway-rail grade crossings include the installation of lights and gates, roadway grade separations, pavement markings, signing, crossing closures, and roadway geometric improvements. Additionally, a comprehensive database of crossings, including geometric challenges, has been developed to provide valuable information to road users (particularly low-clearance commercial vehicles).

The FHWA recently developed *Guidance on Traffic Control Devices at Highway-Rail Grade Crossings* for roadway authorities and railroads to use as a toolbox for grade crossing safety. The FHWA is working on two key documents to include in its grade crossing toolbox: a document on pre-signals and warrants for traffic signals near highway-rail grade crossings and a revision to the *Highway-Rail Grade Crossing Handbook*. Operation Lifesaver, a national, nonprofit education and awareness program, provides additional support to improve safety at highway-rail grade crossings.

Reducing Pedestrian Fatalities

In 2002, 4,808 pedestrians were killed in traffic-related crashes. The FHWA's 5-year goal is to reduce pedestrian fatalities by 465 by the year 2007 by actively pursuing improved pedestrian safety through a comprehensive approach in the fields of engineering, education, and enforcement.

Pedestrian Safety Partnerships

The FHWA has developed pedestrian safety partnerships with State and local officials, concerned citizens, local business leaders, schools, and youth organizations. Partnering with State and local law enforcement is another way that FHWA works to keep pedestrian safety high on the list of priorities. State and local police agencies played an important role in the development of FHWA's successful "Pedestrian Safety Outreach" Campaign.

Engineering Countermeasures

As part of its comprehensive pedestrian safety program, FHWA engineers work closely with State highway engineers and law enforcement officials to identify appropriate engineering safety countermeasures for high-risk locations and new roads. The FHWA supports research into a variety of design features that create safer crossings at intersections for all pedestrians, including those with disabilities. These design features include adequate timing and location of pedestrian signals, improved signage and lighting to enhance visibility, tactile warnings for visually impaired pedestrians, median refuge islands, crosswalk improvements, pedestrian warning signs that alert oncoming traffic to pedestrians in the crosswalk, and highly visible retroreflective signs.

Pedestrian Safety Resources

The FHWA is dedicated to improving public awareness and providing technical training about pedestrian safety. To accomplish this, FHWA has funded and sponsored the Pedestrian Safety Roadshow (<http://safety.fhwa.dot.gov/roadshow/walk>), the “Pedestrian Safety” Campaign, the Pedestrian and Bicyclist Resource Set on CD, the *Safer Journey* CD (seen by more than 5 million school children), the Pedestrian and Bicyclist University Course, the *WALK!* Video, multilingual brochures, and the resource catalogue. The “Pedestrian Safety” Campaign is one of the most popular products developed by FHWA.

It includes a how-to guide for organizing a pedestrian safety campaign at the local level. The guide addresses gaining community “buy-in,” funding, and ways to measure effectiveness and includes sample public service announcements for print, cinema, and television and posters in Spanish and English. Campaign kits have been sent out to 160 communities that have agreed to use the materials in their own pedestrian safety campaigns. An evaluation of effectiveness is ongoing.

Pedestrian Safety Roadshow

One of FHWA’s top educational initiatives for pedestrian safety in recent years is the Pedestrian Safety Roadshow. This education workshop is designed to assist communities in raising public awareness and developing their own approach to improving pedestrian safety. In just 3 years, over 300 people were trained to facilitate this workshop. This successful national program is now considered a model of a successful, community-based, safety campaign. Other groups that promote roadway safety have adopted the aspects of the program.

Q. How can community design standards protect pedestrians?

A. Montgomery County, Maryland, developed and implemented new design standards for including sidewalks and bike paths on residential and collector roads. The new standards balance the goals of developers, utility companies, public agencies, and motorists with the safety of bicyclists and pedestrians. The standards support safe passage for pedestrians, bicyclists, and motorists. On higher speed roads, the standards call for wider clear zones with sidewalks and bike paths farther from the roadway. On low-volume roads, bike paths and sidewalks may be closer to the roadway. The standards for pedestrian facilities also comply with the requirements of the Americans with Disabilities Act.

Q. How have communities developed successful pedestrian programs?

A. The Phoenix, Arizona, School Safety Program is the product of a Safety Task Force that examined the safety conditions at more than 1,700 school-related crosswalks. Its comprehensive approach to safety includes improved training and monitoring of school crossing guards, strengthening traffic enforcement at schools and crosswalks, and encouraging more responsible driver behavior near schools and more parent and community involvement in school traffic safety. Real-time speed indicators have been posted beneath speed limit signs near schools. The School Safety Program has produced English and Spanish versions of the Crossing Guard Training Program and a School Crossing Guard Safety Audit that are used throughout Phoenix.

Additional Program Areas

Improving Safety on Local Roads

Sixty percent of highway fatalities occurred on rural roads in 2002 and 41 percent of these fatalities occurred on rural two-lane roads. Seventy-seven percent of U.S. roads are located in or near areas below 5,000 in population. The sheer number of these roads, their low traffic volumes, and the high cost of major construction make it impractical to rebuild most rural roads with safer designs. Many of these roads are ineligible for most Federal-aid funding and must compete with State priorities for limited safety set-aside funds. Lack of prompt emergency medical response after crashes also contributes to the high number of fatalities on rural roads. Efforts to improve rural road safety are further complicated because they are often the responsibility of local governments without the resources to undertake significant improvements. Despite these challenges, low-cost safety improvements can have a significant impact on the safety of local roads. The FHWA is encouraging State use of innovative strategies to expand these low-cost strategies to roads under local jurisdiction. Technical assistance to local governments on effective safety improvements is critical to reducing fatalities. State departments of transportation and the Local Technical Assistance Program (LTAP) are important conduits of information on low-cost countermeasures to local governments. The FHWA is also initiating a pilot Roadway Safety Circuit Rider Program, based in LTAP centers, to provide local governments engineering and technical support and training in best practices and low-cost safety countermeasures to help them reduce fatalities on local roads.

Speed Management

Managing speed is a complex problem involving many factors including public attitudes, driver behavior, vehicle performance, roadway characteristics, enforcement strategies, court sanctions, and speed zoning. The problem is being addressed through a multi-disciplinary Speed Management Team that includes participation from the FHWA, NHTSA and the FMCSA. The team has drafted a strategic initiative that outlines actions needed to more effectively manage speed and reduce speeding related fatalities and injuries. Variable speed limits that change with road, weather, and traffic conditions have been identified as a key engineering strategy to more effectively manage speed and crash risk on freeways. Field operational tests in work zones have been carried out with promising results. A web-based expert system known as USLIMITS has been developed to assist practitioners in setting reasonable, safe, and consistent speed limits in speed zones. The expert speed zone advisor will be of particular use to small communities and agencies that lack experienced traffic engineers. NHTSA and FHWA are jointly supporting efforts in seven states to demonstrate and evaluate a holistic approach to the setting and enforcement of rational speed limits. A series of pilot workshops have been carried out that brought together critical engineering, enforcement, and judiciary personnel to discuss the multi-disciplinary aspects of managing speed and identified actions needed to restore the credibility of speed limits. A train-the-trainer workshop and planning guide for others who want to sponsor similar speed management workshops are under development.

Older Drivers

Older drivers (age 70 and over) have a high rate of crashes and fatalities per mile driven, second only to that of drivers aged 16 to 24. The FHWA recognizes the need to address the concerns of the growing number of older drivers. To help engineers incorporate these needs in highway design, FHWA has published the results of an older driver research program in *The Older Driver Highway Design Handbook*. The FHWA also offers a 1-day Older Driver workshop to educate traffic engineers on highway design elements that address older drivers' needs.

Road Safety Audits

A road safety audit is a formal safety performance examination of an existing or future road or intersection by an independent team that then reports on potential safety issues. The FHWA has been promoting road safety audits as a tool to improve safety. A brochure has been developed for marketing this tool to local decision makers, and a Web site (www.roadwaysafetyaudits.org) has been updated to provide practitioners with resources and information to begin a program. The Cities of Grand Rapids and Detroit, Michigan, have conducted numerous intersection safety audits in partnership with AAA Michigan. A similar program is beginning in Milwaukee, Wisconsin. A model road safety audit program can be found at the South Carolina Department of Transportation. The department conducts 10 road safety audits each year on projects at various stages of development including design, construction, and existing roads.

Integrating Safety into Transportation Planning

The potential to improve highway safety would be greatly enhanced if safety were fully integrated into the transportation planning process. Success in this area can provide access to additional Federal funds for safety and the opportunity to influence State and metropolitan plans and policies to improve safety. It also provides the opportunity to educate decision makers within the planning process on the importance of safety.

The Transportation Equity Act for the 21st Century (TEA-21) modifies the metropolitan and statewide transportation planning processes to “provide for consideration of projects and strategies that will increase the safety and security of the transportation system for motorized and nonmotorized users.” While safety is often listed as a goal, specific strategies to increase safety are not yet a part of many transportation plans. Safety conscious planning is an initiative led by FHWA in cooperation with the Transportation Research Board, the Governors’ Highway Safety Association, NHTSA, FMCSA, AASHTO, the National Association of Regional Councils, and the Association of Metropolitan Planning Organizations to integrate safety as an explicit priority within the transportation planning process, in both short-range metropolitan and statewide transportation improvement programs and long-range transportation plans. Initiative goals include the consideration of safety throughout the entire planning process on a par with environmental compliance, congestion relief, and economic development. The current Federal effort on safety conscious planning is based on partnerships between Federal agencies and leaders within the State and local safety and planning communities. Its purpose is to provide planners with the tools and training needed to accomplish safety conscious planning. Research is underway to develop a guide for planners and tools for forecasting safety needs. Eighteen safety conscious planning forums have brought together State and local safety and planning professionals throughout the country to establish partnerships and action plans for implementing safety conscious planning. State requests for forums are continuing. A training course is now available to assist safety, planning, and transit professionals to integrate safety into the planning process.

Highway Safety Programs: National Highway Traffic Safety Administration

Over the past four decades, the U.S. Department of Transportation (DOT) has used a variety of strategies to reduce highway fatalities and injuries. For example, DOT/NHTSA has worked to improve safety through regulatory action, such as implementing Federal laws that cover safety belt performance requirements, child safety seat construction requirements, air bags, and intoxicated driving standards.

Rather than adopting a single policy to improve safety, NHTSA uses a variety of strategies and approaches, as well as interacting with both the public and private sectors.

Safety Restraint Systems

The public's acceptance of safety restraint systems represents one of the greatest public policy success stories of the past several decades. This success has been the result of the "Buckle Up America" Campaign, which is a four-pronged approach consisting of (1) public-private partnerships, (2) strong legislation, (3) active high-visibility law enforcement, and (4) effective public education. Additionally, the "Click It or Ticket" Mobilizations have proven effective in getting drivers and passengers in motor vehicles to buckle up on every trip, every time. Prompted by these campaigns, public acceptance of safety devices steadily increased during the 1980s, 1990s, and into the current century. By 2004, about 80 percent of American motorists used shoulder belts, compared with 58 percent in 1994.

Several types of restraints help reduce traffic injuries and deaths. One such device, the safety belt, was the earliest type of automobile restraint system. Safety belt systems were introduced in cars in 1965 with lap belts and later included lap/shoulder belts in all outboard seating positions. Lap/shoulder belts will be required in rear center seating positions starting in model year 2006. Beginning with the 1991 model year, car manufacturers were required to install automatic crash protection—either air bags or automatic safety belts for driver and front outboard seating positions. All model year 1998 passenger cars and model year 1999 light trucks were required to have driver and front passenger air bags. According to the National Center for Statistics and Analysis, it is estimated that, as of 2002, more than 133 million air bag-equipped passenger vehicles were on the road, including 111 million with driver and front passenger air bags. A third safety mechanism, child restraint systems, is also increasingly used by parents and caregivers to reduce the likelihood of harm to young passengers.

Exhibit 11-1 shows the number of lives estimated to have been saved by restraint systems between 1993 and 2002. Safety belts saved an estimated 14,164 lives in 2002; air bags saved 2,248 lives; and child restraints saved 376 lives that year. Safety belts alone are estimated to have prevented 112,805 deaths between 1993 and 2002.

For the last several years, NHTSA has engaged in several initiatives to increase occupant safety. Section 1403 of TEA-21, for example, contained a safety incentive grant program (Section 157) to encourage States to increase safety belt use. Under this program, funds were allocated each fiscal year (FY) from 1991 until 2005 to States that exceeded the national average for safety belt use or that improved their State's safety belt use rate. The authorized level for this program increased from \$82 million in FY 1999 to \$112 million in FY 2005.

Exhibit 11-1*Estimated Number of Lives Saved by Restraint Systems, 1993–2002*

Restraint Type	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Safety Belts	7,773	9,219	9,882	10,710	11,259	11,680	11,941	12,882	13,295	14,164
Air Bags	190	309	536	783	973	1,208	1,491	1,716	1,978	2,248
Child Restraints	313	420	408	480	444	438	447	479	388	376

Source: *Fatality Analysis Reporting System (FARS)*.

Section 2001 of TEA-21 reauthorized the State and Community Highway Safety formula grant program to broadly reduce traffic crashes and resulting fatalities, injuries, and property damage. The authorized level increased from \$149.7 million in FY 1998 to \$165 million in FY 2003.

Section 2003(b) of TEA-21 established a new program of incentive grants to encourage States to implement child passenger protection programs. This program authorized \$7.5 million in FY 2000 and FY 2001, and was extended through 2003. Also under Section 2003 of TEA-21, Section 405(a) established a new program of incentive grants to encourage States to adopt and implement effective programs to reduce highway deaths and injuries resulting from individuals riding unrestrained or improperly restrained in motor vehicles. The authorized level for this program increased from \$10 million in FY 1999 to \$20 million in FY 2003.

Responsible Driving Initiatives

The NHTSA works with industry partners, States, and local governments to improve driver behavior. The 1980s and early 1990s saw a great deal of activity, such as the formation of a Presidential Commission on Drunk Driving and grassroots organizations such as Mothers Against Drunk Driving. States also enacted tougher impaired driving laws, and jurisdictions across the country increased their enforcement efforts. All of these efforts increased the public's awareness and concern over traffic safety issues, resulting in a sharp decline in highway fatalities and injuries, particularly those involving alcohol. Additionally, with the establishment of a national drinking age of 21, teens were no longer driving to neighboring States to purchase and consume alcohol.

Following the mid 1990s, however, there was a period when little progress was made in reducing these numbers. Since the late 1990s, DOT/NHTSA has dedicated new focus, energies, and strategies to highway safety efforts; 2003 data indicate that injuries and fatalities have started to decline.

Currently, there are numerous DOT/NHTSA initiatives to promote responsible driving, most notably the prevention of impaired driving. Section 1404 of TEA-21, for example, established a new program of incentive grants (Section 163) to encourage States to establish a 0.08 percent blood alcohol concentration (BAC) as the legal limit for drunk driving offenses. The authorized level for this program increased from \$55 million in FY 1998 to \$110 million in FY 2003. In October 2000, Congress passed legislation that made 0.08 BAC the national standard for impaired driving. States were required to adopt 0.08 BAC laws by FY 2004 or face the withholding of certain highway construction funds.

Before the incentive grant program was signed into law in June 1998, only 16 States had enacted 0.08 BAC per se laws. Between June 1998 and October 2000, two additional States and the District of Columbia enacted and began enforcing these laws. Now, in 2004, following the implementation of the combined incentive and sanction program, all 50 States and the District of Columbia have enacted 0.08 BAC per se laws.

The TEA-21 also established other programs to reduce impaired driving, including the Section 410 impaired driving incentive grant program. With the implementation of Section 410, alcohol-related fatalities dropped significantly in 2003, the first such decline since 1999.

High-Visibility Enforcement

Enforcement alone has its limitations; however, enforcement combined with extensive media support (such as seen with the “Click It or Ticket” Campaign) greatly improves highway safety, particularly in the area of safety belt use. The perceived risk of receiving a citation is increased, even if the actual risk is only slightly higher. Research shows that the public will buckle up if they believe the police are enforcing the law. High-visibility enforcement campaigns, combined with coordinated publicity, have also helped to reduce the number of alcohol-related crashes and increase the use of child restraint systems. Recently, there has been interest in increasing public awareness campaigns to spotlight critical issues such as the dangers of fatigued and distracted driving and the importance of rural emergency management services. Speeding is also a continuing program; in 2003, speeding was a contributing factor in 31 percent of all fatal crashes.

Public Awareness

Public awareness campaigns can shape public opinion if the advertising is effective, the message is strong, and the media supports the campaign by donating airtime and space. The NHTSA has two examples of how public service messages influence attitudes and behavior. With the help of the “Drunk Driving Prevention” Campaign, begun in 1983, the proportion of traffic fatalities caused by alcohol-related crashes dropped from 60 percent in 1982 to 40 percent in 2004. Sixty-two percent of Americans say they have tried to stop someone from driving drunk, and 90 percent of adults are aware of the tagline “Friends Don’t Let Friends Drive Drunk.”

Safety belt education is another example of how public awareness can stimulate a behavior change. In 1985, only 21 percent of Americans buckled up. The NHTSA’s ad campaign, featuring the crash test dummies “Vince and Larry” helped persuade the country to “don’t be a dummy, buckle your safety belt.” Using safety belts is now considered the norm, and it’s the law in 49 states. Vince and Larry retired a few years ago, as NHTSA found that a strong enforcement message, coupled with vigorous ticketing campaigns, raised safety awareness and raised safety belt usage rates to the highest in America’s history—80 percent in 2004.

While donated airtime can have enough of an educational impact to positively affect behavior, it also can be “hit or miss” since there is no way to control when television and radio stations actually play the PSA or when a target audience actually sees the message. Paid advertising, on the other hand, allows an Agency like NHTSA to have more control over when a target audience sees and/or hears a message that is designed to positively affect behavior change.

In 2003, with Congressional funding support for national paid advertising, NHTSA promoted the buckle up message in a campaign called “Click It or Ticket” (the “Click It or Ticket” Mobilization combines high-visibility law enforcement, advertising, and earned media to increase safety belt and child safety seat use). Forty-three States, the District of Columbia, and Puerto Rico used paid advertising to support the mobilization. The campaign continued at the same rate of support in 2004. More than \$50 million was spent over 2003 and 2004 in paid advertising with earned media value over both years averaging \$13 million. The paid advertising of a strong enforcement message, “wear your safety belt or you *will* get a ticket,” along with a strong law enforcement component, helped raise the safety belt use rate by 7 percent.

For the May 2004 “Click It or Ticket” Mobilization, NHTSA made a media buy of \$10 million on network and cable television and network radio. The agency also spent \$8.6 million on media buys for 17 States—Arkansas, Arizona, California, Florida, Illinois, Maine, Maryland, Mississippi, Nevada, Nebraska, New Mexico, North Carolina, Oregon, Pennsylvania, Utah, Vermont, and Wisconsin. NHTSA also made a separate media buy to support pickup truck campaigns for Arkansas and New Mexico. The States received over \$4.2 million in value-added (bonus) media and exposure (including network billboards, liners, live reads, sports tickers, bonus spots, program upgrades, etc.) in support of “Click It or Ticket,” and the national safety belt use rate rose to its present level of 80 percent.

Intelligent Vehicle Initiative

The Intelligent Vehicle Initiative (IVI) of the DOT Intelligent Transportation Systems (ITS) program is a research program that has explored how state-of-the-art advanced technologies can help drivers avoid crashes that would otherwise occur. However, providing drivers with additional in-vehicle information is a complex endeavor that, unless technologies are carefully designed, may even compromise driver safety and efficiency. For this reason, DOT has carefully selected certain IVI services that it considers “prime candidates” for improving driver performance because they (1) improve safety or (2) may impact safety. The program has addressed four major types of crashes: rear-end crashes, road departure crashes, crashes associated with lane changes, and crashes that occur at intersections. The program also addresses how driver inattention and distraction contribute to crashes and how advanced technologies can be used to ameliorate this problem. Work in each of these problem areas consists of basic work in sensors, driver interfaces, and warning/control strategies and culminates in a field operational test of state-of-the-art driver assistance systems. The IVI program has been a landmark effort to develop a solid understanding of how advanced technologies can help improve safety on our public roads. The program will soon conclude as the last four field operational tests are completed during 2005 and 2006. The information gained from the IVI program provides the NHTSA, other DOT agencies, and the motor vehicle industry with a wealth of factual data that will serve as a foundation for future efforts to implement effective driver assistance systems.

Data Collection

Section 2005 of TEA-21 established a new program of incentive grants to encourage States to adopt and implement effective programs to improve data collection and to link State systems with other State and National data systems. This incentive program calls for evaluating the effectiveness of efforts to improve the system, linking data systems and traffic records with other data systems within a State, and improving the compatibility of the State data system with National data systems. The improvements to data collection will enhance a State’s ability to observe and analyze national trends in such areas as crash occurrences, rates, outcomes, and circumstances.

Highway Safety Programs: Federal Motor Carrier Safety Administration

The trucking industry is large, complex, and dynamic. The FMCSA estimates that there are almost 675,000 motor carriers operating commercial motor vehicles (CMVs) in interstate commerce. Motor carriers vary widely in size, from hundreds of thousands of owner-operators to over 50,000 carriers with 10 or more power units. Nationwide, approximately 7.9 million trucks and nearly 800,000 buses are registered to State departments of motor vehicles. In 2002, there were more than 11.3 million truck and 470,000 bus crossings annually at U.S.-Canada and U.S.-Mexico borders. The agency also has jurisdiction over 6 million commercial drivers.

In 2002, large trucks represented only 3.5 percent of registered vehicles; however, they accounted for 7.5 percent of travel volume on the Nation's highways. Of all the people killed in motor vehicle crashes, 11.5 percent died in crashes involving a large truck (FMCSA defines a large truck as a motor vehicle with a gross vehicle weight greater than 10,000 pounds). Thus, large trucks are overrepresented in fatal crashes. In 2002 crashes involving large trucks, an estimated 4,939 people died and 130,000 were injured in the fourth year in a row of decreasing fatalities; this compared with 4,856 fatalities and 133,000 injuries in 1993. While progress is being made toward meeting the FMCSA's goal of saving lives and reducing injuries by preventing truck and bus crashes, too many people continue to be injured and die as a result of crashes involving large trucks.

According to the Bureau of Labor Statistics, 808 truck drivers died while working in 2002, representing the largest number of on-the-job deaths for any occupation in the United States. With a fatality rate for truck drivers of 25.0 deaths per 100,000 employed, truck driving is the fourth most dangerous occupation in the country. Fatal highway incidents were the most frequent type of all fatal workplace events, accounting for 1,421 of the 5,524 (25 percent) total occupational fatalities. Truck drivers account for nearly 40 percent of all workers losing their lives on the highways.

The FMCSA's strategic objective is to save lives and reduce injuries by preventing truck and bus crashes. This is aligned with and contributes to the DOT Safety strategic objective and Highway Safety performance goal. Progress toward this goal, though, is challenged by annual increases in motor carrier traffic that increase exposure to crashes. Truck vehicle miles traveled (TVMT) have doubled since 1978 and are forecast to increase on the order of 3.4 percent per year. The trend for miles traveled by passenger vehicles, with which CMVs share the highways, is also on the rise, increasing car-truck interaction on the highways and contributing additional exposure to crashes. Without effective safety interventions, fatalities and injuries from truck-involved crashes could be expected to increase commensurate with the increases in TVMT.

Enforcement Programs

The FMCSA's enforcement authority extends to interstate motor carriers and motor coaches. The FMCSA enforcement operations help ensure compliance with the Federal Motor Carrier Safety Regulations (FMCSRs), and their proven effectiveness in reducing crashes and fatalities on the highways has been borne out in the findings of the Roadside Inspection and Traffic Enforcement Intervention Model and Compliance

Review (CR) Impact Assessment Model. The Congress and the DOT Office of Inspector General (OIG) both emphasize the importance of strong enforcement to ensure motor carrier safety. However, CRs, the agency's primary method for determining compliance, presently reach less than 2 percent of the carrier population.

Q. What impact do Compliance Reviews have on safety?

A. The FMCSA conducts on-site CRs in order that, through education, heightened awareness of safety regulations, and the enforcement effects of the CR, motor carriers will improve the safety of their commercial vehicle operations and, ultimately, reduce crash incidence. The most recent implementation of FMCSA's Compliance Review Impact Assessment Model indicates that, by having completed CRs on high-risk carriers in 2001, FMCSA contributed to avoiding 1,600 crashes in 2002, including 58 fatal crashes and 690 injury crashes. It is estimated that 67 lives were saved and 1,105 injuries were avoided as a result of these CRs. Additionally, FMCSA annually conducts approximately 2,500 reviews of carriers that have a less-than-satisfactory safety rating and have been identified as continuing to pose a safety risk on the Nation's highways.

The FMCSA undertakes a balanced, targeted enforcement regime comprised of CRs, conditional carrier reviews, new entrant safety audits, enforcement actions for violations to include available sanctions, and a range of border-specific compliance and enforcement activities. This enforcement regime will be focused to increase the FMCSA's reach to those segments of the industry that present the highest safety risk.

New Entrant

In May of 2002, FMCSA published its New Entrant Safety Assurance Process Interim Final Rule. It became effective January 1, 2003. The agency began conducting audits in April 2003.

The new entrant program targets motor carriers that are "new entrants" into the truck and bus industries and was originally designed to be primarily an

educational rather than an enforcement program. However, the agency found that many new entrants were operating without comprehensive knowledge of the requirements and without being in compliance with applicable regulations. The FMCSA has revised the program to give it a greater enforcement focus. The operating philosophy is to address carrier safety problems at the beginning of operations to prevent larger safety problems from developing later on. This approach is a more effective use of limited agency enforcement resources and works to more quickly get unsafe carriers either operating more safely or off the roads.

Studies demonstrate that new entrants have higher crash rates than more established carriers and are less likely to comply with Federal regulations. Given that approximately 40,000 to 50,000 new entrants apply for registration annually, it is clear that attention to this population is imperative. The FMCSA has established the New Entrant Safety Assurance Process whereby all new entrants, in order to register, must certify that they are knowledgeable about the FMCSRs and Federal Hazardous Materials Regulations (FHMRs), and must undergo a safety audit within the first 18 months of registration, prior to receiving permanent operating authority.

In FY 2003, FMCSA and the States performed nearly 7,200 new entrant safety audits. Of these, about 58 percent were performed by FMCSA and 42 percent by the States. In FY 2004, FMCSA and the States plan to perform about 25,000 new entrant safety audits. Through the first 6 months of FY 2004, FMCSA performed 43 percent of the safety audits and the States performed 57 percent.

Substance Abuse Program

The Omnibus Transportation Employee Act of 1991 authorized DOT to mandate substance abuse management for safety-sensitive employees in the motor carrier industry. In February 2004, FHWA's Office of Motor Carriers published final drug and alcohol testing regulations for drivers operating in commerce with a commercial driver's license. FMCSA is responsible for implementing these regulations and auditing the compliance of motor carriers with these rules. Drug and alcohol checks are performed during every compliance review performed on motor carriers by FMCSA and State enforcement personnel.

North American Free Trade Agreement

The FMCSA implements the cross-border truck and bus provisions of the North American Free Trade Agreement (NAFTA). Since trucking is the principal means of commercial transportation between Mexico, Canada, and the United States, NAFTA includes a number of provisions that will greatly affect commercial vehicle operations. In preparing to implement the NAFTA access provisions fully, FMCSA has been working aggressively with the States and Mexico to increase enforcement and compliance and to improve safety systems on both sides of the U.S.-Mexico border.

The FMCSA's border program is another important agency compliance and enforcement program. The border enforcement program has provisions as directed in Section 350 of the 2002 DOT Appropriations Act. To ensure that Mexican motor carriers operating in the United States comply with the FMCSRs and FHMRs as required for both U.S. and Canadian motor carriers, FMCSA has established a safety audit process to ensure that Mexican carriers comply prior to operating in the United States beyond the commercial zone. FMCSA and State partners will maintain a strong safety focus at the border crossings for Mexican trucks entering the country. The FMCSA's border enforcement program will support activities such as inspection of vehicles; electronic verification of driver licenses, proof of insurance, and operating authority; public education and outreach; safety audits; compliance reviews; and, enforcement actions (addresses OIG Audit MH-2003-041, "Implementing NAFTA-II").

Southern Border

Border grant funds are used to support State inspectors involved in inspecting foreign carriers along the border. State truck and bus safety enforcement agencies along the southern border have enhanced their presence along the border by increasing their staff to over 300 inspectors, staffing 25 commercial cargo crossings. As a result of these increased resources, the number of State border inspections is targeted to increase from approximately 200,000 in FY 2004 to approximately 400,000 in FY 2005. The States also use FMCSA grant funding to deploy officers in mobile units to conduct roadside inspections and perform inspections of commercial passenger carriers at other crossings, nonfixed facilities, and destination points in the United States. In addition, grant funding is used to construct permanent inspection facilities to handle the flow of traffic and to provide safer locations to conduct inspections.

Northern Border

In August 2002, the President signed the 2002 Supplemental Appropriations Act for Further Recovery From and Response to Terrorist Attacks on the United States (S. 2551). This legislation provided funding to FMCSA to conduct a northern border safety and security study. One objective of the study is to provide recommendations on the roles and responsibilities FMCSA and State commercial vehicle enforcement agencies should play at the northern border with respect to commercial vehicle security. The study will be

completed and a final report issued in 2004. At the completion of the study, FMCSA will review the report and take action to plan and implement the findings and recommendations, as appropriate.

Performance and Registration Information Systems Management Program

The FMCSA also implements the Performance and Registration Information Systems Management (PRISM) Program, a grant program to States with the goal of improving motor carrier safety through a comprehensive system of identification, education, awareness, safety monitoring and treatment. In 2004, there are 32 States in the PRISM Program. The PRISM initiative has two major elements. The Commercial Vehicle Registration Process establishes a system of accountability by ensuring that no vehicle is registered without identifying the carriers responsible for the safety of the vehicle during the registration year. The second element is the Motor Carrier Safety Improvement Process, designed to improve the safety performance of motor carriers that have repeated safety problems. Carriers that do not improve their safety performance face progressively more stringent penalties, including Federal "unfit" or "imminent hazard" designations and the possible suspension of vehicle registration by the State.

Outreach

The FMCSA conducts outreach to promote safe operation and best highway safety practices for commercial motor vehicles and passenger vehicles with whom they interact on the highways. Studies indicate that a large share of fatal crashes involving a CMV have causal factors attributable to the passenger vehicle involved in the crash. Of course, the overwhelming majority of casualties are the occupants of passenger vehicles. The impact of present enforcement funded by the Motor Carrier Safety Assistance Program is significant, but is largely limited in its reach to noncommercial drivers. More needs to be done to heighten awareness of the hazards of driving around trucks, consistent with broader DOT highway safety objectives. To change behaviors and heighten appreciation of safe operating practices, the agency identifies inherent problems or areas for improvement and targets educational materials and outreach countermeasures at affected audiences. Appropriately, FMCSA targets specific outreach aimed at changing the knowledge, attitudes, and behaviors of commercial motor carriers, CMV drivers, and passenger vehicle drivers driving in the vicinity of large trucks. Progress is being made in communicating about safe driving practices around trucks. Encouragingly, fatal crashes involving single large trucks and passenger vehicles were reduced 7.3 percent between 2000 and 2002.

Educating carriers about the benefits of operating safely, and in compliance with safety regulations, is much more advantageous to both the carrier and the enforcement community than imposing enforcement sanctions on the carrier (National Transportation Safety Board H-99-007 and H-99-008 recommend minimum standards for motor coach safety briefing materials and a requirement for pre-trip passenger briefings). In 2004, FMCSA completed the *Unsafe Driving Acts of Motorists in the Vicinity of Large Trucks* video as well as developed a model-training curriculum regarding sharing the road with CMVs. The FMCSA also published a pamphlet entitled *Safety Management for Motor Carriers: Learning from the Leaders in Safety Management Practices*, a best-practices approach to motor carrier safety.

Driver error in both passenger and commercial vehicles is the leading cause of crashes. Driving in or around large trucks and buses is particularly hazardous, resulting in a substantial portion of the nearly 5,000 truck- and bus-related fatalities annually. Consistent with DOT's approach to broader highway safety

management, FMCSA addresses this issue by developing strategies to educate all drivers to share the road with large trucks. “Share the Road Safely” develops and implements education and outreach safety strategies combined with traffic enforcement to improve the way all highway users operate in or around trucks (The Government Accountability Office [GAO] audit report, GAO-03-680, recommends better evaluation of outreach initiatives).

The FMCSA has worked very closely with NHTSA to determine the best avenues for educating both the motoring public and CMV drivers, including incorporating such information into driver education courses. An integral part of the program includes a demonstration project that combines education, communication, and a high-visibility enforcement effort. In addition, FMCSA has taken steps to address recommendations offered by GAO in May 2003 to improve the way it measures the effectiveness of the “Share the Road Safely” Program. The FMCSA has adopted a systematic strategy for evaluating “Share the Road Safely” initiatives using the Selective Traffic Enforcement Program model developed by NHTSA. These improvements to the program, plus over 10 years of experience in reaching the motoring public on the limitations of CMVs and safe driving practices in proximity to large CMVs, puts FMCSA in a position to take the lead for this important highway safety program.

Increasing Driver Safety Belt Use

A recent study conducted by FMCSA showed that only 48 percent of all commercial drivers wear safety belts as compared with 79 percent of passenger car drivers. Increasing safety belt usage could eliminate many of the 171 truck driver ejection fatalities each year. The FMCSA’s CMV Safety Belt Usage Improvement Program is designed to support DOT safety belt objectives by increasing the level of safety belt usage by the target audience to improve their chance of surviving a CMV crash. This education/outreach program promotes the use of safety belts by highlighting the risks of not wearing one, combined with promoting traffic enforcement. The goal is to increase CMV driver safety belt usage by at least 15 percent from 2006 to 2009. Performance will be assessed by a comparison of CMV driver safety belt usage and CMV driver safety belt usage improvement rates. On December 9, 2003, DOT established a Commercial Motor Vehicle Safety Belt Partnership. This is a government/private industry partnership dedicated to increasing safety belt usage among CMV drivers. The FMCSA is implementing a five-point plan that addresses partnership, research, education, and outreach materials, as well as enforcement activities.

Motorcoach Safety

Also, there is increasingly a role for outreach in communicating information about traveling safely by motorcoach. Presently, most consumers seeking motorcoach passenger transportation service buy this service based largely on price. The FMCSA seeks to develop a commercial passenger vehicle education and outreach campaign, “Choosing a Safe Motorcoach Company,” to help a consumer also consider safety issues in their transportation choices. This approach has the additional benefit of encouraging motorcoach companies to maintain good safety records.

Data Collection

Data collection is a vital component of the Department’s safety efforts. Data are used to identify problems, target enforcement actions, evaluate safety programs, monitor trends, and guide resource allocations to address highway safety problems. Several modal agencies within DOT are involved in collecting data. The NHTSA collects information on all fatal crashes and a sample of all police reportable crashes. The FMCSA collects crash and citation data on all medium and heavy trucks; vehicles carrying hazardous material; and

buses with seats for more than nine occupants that are involved in a fatal, injury, or tow-away crash. The FHWA collects information through the Highway Performance Monitoring System. The FHWA, FMCSA, NHTSA, Bureau of Transportation Statistics (BTS), and FRA represent DOT at the International Traffic Records Forum, an annual meeting that addresses worldwide crash data collection efforts. The FHWA's Office of Safety has also supported the National Model. This model is a software package that helps the local law enforcement agencies collect accurate crash information.

The FMCSA and NHTSA are collaborating on a study to determine the causes of large truck crashes that result in a fatality or serious injury. The Large Truck Crash Causation Study involves data collection at 24 sites nationwide. Data collection ended December 31, 2003, and the final database will be ready for analysis in late 2004.

Data collection at the national level is sometimes problematic. Although all States collect crash data, all States do not follow the exact same definitions or attributes in collecting crash data. The FHWA, FMCSA, NHTSA, and BTS support the implementation of Model Minimum Uniform Crash Criteria (MMUCC). MMUCC were developed in response to States' requests to develop a minimum standardized set of data elements. This minimum set promotes comparability of data within the highway safety community and serves as a foundation for State crash data systems.

The FMCSA maintains the Motor Carrier Management Information System crash file that is designed to be a census of all medium and heavy truck and bus crashes. However, FMCSA only received information on approximately 70 percent of all reportable crashes. Congress has given FMCSA funds to share with the States to improve the collection and analysis of truck and bus crash data.

Reporting data timely, accurately, and completely is necessary to determine the extent of the highway safety problem and to target enforcement and education programs.

Transit Safety Programs: Federal Transit Administration

The FTA has six programs designed to work continuously to improve the safety and security of the Nation's transit systems: (1) Modal Safety, (2) Information Sharing/Technical Assistance, (3) Training and Education, (4) Substance Abuse, (5) Security Initiative, and (6) Data Collection and Analysis. Additionally, FTA works to improve safety through the DOT's Intelligent Vehicle Initiative.

Modal Safety Program

The Modal Safety Program has three key components:

- Rail Fixed Guideway
- Railroad
- Bus.

The Rail Fixed Guideway component of the Modal Safety Program was implemented in 1995 when FTA published a final rule requiring States with fixed guideway systems to designate an independent oversight agency to oversee the safety of rail systems not regulated by FRA. Currently, 23 States and 37 systems are included in this program, but this number will change as new systems are opened. FTA audits the affected States for compliance with the rule and provides technical assistance.

The Railroad component consists of an ongoing coordination program with FRA on issues that affect the transit industry. The FTA participates with FRA in the development of shared track and shared corridor safety standards as well as the granting of waivers for shared track operations. The FTA is a member of the Rail Safety Advisory Committee for matters relating to commuter railroads. Three subprograms under the railroad component are (1) Railroad Grade Crossing Safety, (2) Rail Vehicle Materials Safety, and (3) Train Control Centers Safety.

Under the Railroad Grade Crossing Safety subprogram, FTA demonstrates, evaluates, and deploys innovative grade crossing technologies. The strategic deployment of these technologies enhances transit's ability to alert motorists and pedestrians of oncoming trains, improve passive and active warning signs and signals for light rail and commuter rail transit, develop cost-effective off-track train presence detection systems, and assess safety data to determine target areas for technology enhancements.

Under the Rail Vehicle Materials Safety subprogram, FTA is working with FRA to develop fire safety standards (flammability and smoke emissions) for materials used in the interior of rail vehicles and to test these standards. The FTA is also working with the Interagency Fire and Materials Working Group of the Federal government to produce uniform fire performance guidelines for any materials that may be used by government agencies. This effort includes testing new composites that may be considered for use in new railcars and buses.

Under the Train Control Centers Safety subprogram, FTA is working with FRA to assess the adequacy of rail control centers for rail transit systems operating on rights-of-way with freight and intercity passenger services. The FTA is in the process of evaluating control centers' equipment and personnel, focusing on the effectiveness of these centers during peak times. Additional work burdens will fall on control centers with the expansion of commuter service on freight railroad rights-of-way. In support of this subprogram, FTA completed an assessment of rail multimodal management centers to understand information exchanges between rail agencies that operate with common passenger terminals, shared tracks, shared rights-of-way, and joint control centers. Information exchanges were classified into four categories: operations, traveler-related functions, safety, and security. In each area, information-sharing opportunities exist, and as joint-use and mixed rail corridor operations increase, the utility of these centers will continue to grow.

The Bus component of FTA's Modal Safety Program comprises two parts. The Bus Testing Program ensures that any deficiencies in new bus models are corrected before being put into revenue service. Since its implementation, this program has successfully identified more than 4,000 malfunctions ranging from minor problems to serious design deficiencies. A state-of-the-art facility in Altoona, Pennsylvania, has tested 150 new bus models since 1992. In 1998, FTA initiated the Modal Transit Bus Safety and Security Program. This program established the core safety and security program elements that all transit bus agencies should implement. The core program elements involve security, driver/employee selection, driver/employee training, vehicle maintenance, drug and alcohol abuse programs, and safety data acquisition and analysis.

Information Sharing and Technical Assistance Program

The FTA's Information Sharing and Technical Assistance Program includes a clearinghouse that is the focal point for all requests for information, materials, and resources currently available on transit safety, security, and related technologies; a transit safety and security Web site describing ongoing programs and new initiatives; and technical assistance, guidelines, and newsletters on safety issues.

Threat and Intelligence Sharing

Homeland Security Presidential Directive (HSPD) -7 encouraged the creation of private sector Information Sharing and Analysis Centers (ISACs) to protect various critical infrastructure areas, such as public transit, from intentional harm from individuals or groups. At the request of DOT, the Surface Transportation ISAC (ST-ISAC) was formed. The Public Transportation ISAC (PT-ISAC) operates as a node within the ST-ISAC to take advantage of the overarching issues specifically related to public transportation. On January 23, 2003, the American Public Transportation Association (APTA) was awarded status as Sector Coordinator by DOT in the creation of the PT-ISAC to further promote security for the public transportation industry. The FTA provided a grant of \$1.2 million to APTA to fund the initial 2 years of this project, after which the ISAC was required to become self-sufficient. APTA is now working with the Department of Homeland Security (DHS) and will participate in the Homeland Security Information Network program that will allow for the continued dissemination of threat and intelligence information to the transit industry.

Training and Education Program

The FTA provides safety and security training to the transit industry through the Transportation Safety Institute (TSI), the National Transit Institute (NTI), Johns Hopkins University, and the Volpe Center. The curriculum includes courses such as Transit Workplace Safety and Security, System Security Awareness for Transit Employees and Security Incident Management for Transit Supervisors, Effectively Managing Transit Emergencies, Counterterrorism Strategies for Transit Managers, Terrorist Activity Recognition and Reaction, Transit Rail Accident Investigation, Transit Rail System Safety, Fundamentals of Bus Accident Investigation, and Substance Abuse Management. Through TSI, FTA has provided training to over 85,000 transit industry employees since 1971, including more than 45,000 since 1998. Through NTI, FTA has conducted three Workplace Safety and Security train-the-trainer courses in FY 2003 and has delivered four additional courses in FY 2003 and FY 2004. In FY 2003, through the Volpe Center, FTA conducted nine drug and alcohol seminars drawing over 950 transit participants.

Substance Abuse Program

The Omnibus Transportation Employee Act of 1991 authorized DOT to mandate substance abuse management for safety-sensitive employees in the transit industry. In February 1994, FTA published final drug and alcohol testing regulations for transit employers. The FTA is responsible for implementing these regulations and auditing the compliance of transit operators with these rules. As of September 30, 2004, FTA has conducted 233 audits since the inception of the drug and alcohol audit program in 1997.

Security Initiative Program

In the post-9/11 environment, FTA has launched an extensive security initiative program, substantially funded by \$23.5 million in security funds including in the Defense Department Supplemental Appropriation of 2002. Key elements of the FTA security initiative include the following:

- Security readiness assessments/threat and vulnerability assessments conducted at the 37 largest transit agencies
- Grants of up to \$50,000 for conducting emergency drills and exercises provided to 83 of the largest transit agencies
- Security roundtables for transit security executives and officials representing the 30 largest transit agencies
- On-site security and emergency management technical assistance provided to the 50 largest transit agencies (currently in progress, with 15 sites now completed)
- Research and technology projects in areas such as chemical/biological detection, mapping based on geographic information systems, security design guidelines, emergency communications systems, and integrated intrusion detection
- Development of an FTA top 20 security action item list for transit agencies
- Enhancements and additions to the NTI and TSI transit security training curriculum, including new counterterrorism training

- Development of protective measures for transit agency implementation, based on the Homeland Security Advisory System color-coded threat level system
- Initiation of a public transit ISAC to facilitate improved intelligence sharing in the transit industry
- 19 Connecting Communities regional forums across the country to improve interagency awareness coordination by bringing together emergency first responders (at the local, regional, State, and Federal levels) and transit agency security and emergency management officials
- Development and launch of a Transit Watch security public awareness campaign for transit agencies, modeled after the Highway Watch Program and other similar “eyes and ears” awareness initiatives
- Development and publication of the *System Security and Emergency Planning Guide* to serve as a resource compendium for transit agencies.

Throughout the ongoing process of enhancing and improving the transit industry’s state of security readiness in the post-9/11 climate, FTA has strategically focused its efforts and resources on three key priorities:

- Training (including general security awareness training for all transit employees and specialized advanced security training for law enforcement, first responder, and other personnel with direct responsibilities for transit security)
- Public awareness (as exemplified by the Transit Watch public awareness program)
- Emergency preparedness (the scope of which includes both natural and man-made disasters).

In concert with other Federal-level agencies, and as an integral modal agency of DOT, FTA has also focused considerable effort in working closely, sharing information, and coordinating programs with the Department of Homeland Security (including such agencies within DHS as the Transportation Security Administration, Office for Domestic Preparedness, U.S. Coast Guard, and Federal Emergency Management Agency).

Data Collection and Analysis Program

All transit agencies must submit safety and security data into the FTA National Transit Database Safety and Security Module. These data are published annually in the *Transit Safety and Security Report* (formerly the *Safety Management Information Statistics Report*). It provides FTA and the transit industry with a basis for identifying key safety concerns as well as possible solutions. The FTA has extended its efforts by collecting transit vehicle accident and incident causal data through State Safety Oversight Annual Reporting and the February 2002 revision of the National Transit Database, which expands the range of causal data collected and the frequency of its reporting.

Intelligent Vehicle Initiative

The FTA is also working to improve safety through the DOT’s Intelligent Vehicle Initiative. Among the elements under investigation are precision docking systems and collision warning systems. Precision docking systems will allow buses to be automatically maneuvered into a loading zone or maintenance area, allowing easier access for passengers and more efficient maintenance operations. Collision warning systems will help the bus driver and surrounding vehicle drivers operate their vehicles more safely.