A Report to Congress and the

National Transportation Safety Board

2016 Annual Report

The U.S. Department of Transportation's

Status of Actions Addressing the

Safety Issue Areas on the

NTSB's Most Wanted List

U.S. Department of Transportation

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Executive Summary

Safety is U.S. Department of Transportation's (DOT or Department) highest priority, and the Department is committed to advancing safety in all modes of transportation: highway, rail, air, water, and pipeline. We strive to continuously improve our safety mission across the Department.

Each year the National Transportation Safety Board (NTSB) releases a Most Wanted List, which represents the NTSB's advocacy priorities. Pursuant to section 1135(e)(1) of Title 49, *United States Code*, the Department is required to review and report the status of actions responding to the NTSB's annual Most Wanted List report. This report describes the activities that DOT is undertaking to enhance the safety of the Nation's transportation network for each of the NTSB's 2016 Most Wanted List safety issue areas, and fulfills the reporting requirement.

The 2016 NTSB Most Wanted List is comprised of 10 safety issues areas:

1. Reduce Fatigue-Related Accidents
2. Improve Rail Transit Safety Oversight
3. Promote Availability of Collision Avoidance Technologies in Highway Vehicles
4. Strengthen Occupant Protection
5. Disconnect from Deadly Distractions
6. Prevent Loss of Control in Flight in General Aviation
7. Promote Completion of Rail Safety Initiatives
8. End Substance Impairment in Transportation
9. Require Medical Fitness for Duty
10. Expand Use of Recorders to Enhance Transportation Safety

Four of the issue areas are the same from the 2015 Most Wanted List: disconnect from deadly distractions; end substance impairment in transportation; prevent loss of control in flight in general aviation; and require medical fitness for duty. Four safety issue areas have some overlap with the 2014 or 2015 Most Wanted List: promote completion of rail safety initiatives; improve rail transit safety oversight; strengthen occupant protection; and reduce fatigue-related accidents. New on the 2016 list are promote the availability of collision avoidance technologies in highway vehicles, and expand use of recorders to enhance transportation safety.

For each 2016 Most Wanted List issue discussed in this report a summary of the issue area as stated by NTSB appears in *italics*, followed by the Department's response[1]. The DOT Operating Administrations (OAs) and the Office of the Secretary of Transportation (OST) provide a description of recent activities related to addressing the safety concerns identified in the Most

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[1] Note that the vessel-related responses to the 2016 Most Wanted List are not included in this report because the U.S. Coast Guard, which is located in the Department of Homeland Security, has regulatory jurisdiction over vessel safety.

Wanted List, as well as other actions that are germane. The OAs contributing to this report and DOT's response are:

- Federal Aviation Administration (FAA);
- Federal Highway Administration (FHWA);
- Federal Motor Carrier Safety Administration (FMCSA);
- Federal Railroad Administration (FRA);
- Federal Transit Administration (FTA);
- National Highway Traffic Safety Administration (NHTSA); and
- Pipeline and Hazardous Materials Safety Administration (PHMSA).

1. **Reduce Fatigue-Related Accidents**[2]

<u>What is the issue?</u>

People need to be awake and alert to be at their best. But when they operate vehicles while fatigued, they aren't at their best—in fact, they are endangering themselves and others.

Human fatigue is a serious issue affecting the safety of the traveling public in all modes of transportation. Nearly 20 percent of the 182 major NTSB investigations completed between January 1, 2001, and December 31, 2012, identified fatigue as a probable cause, contributing factor, or a finding.

Human fatigue is both a symptom of poor sleep and health management, and an enabler of other impairments, such as poor judgment and decision making, slowed reaction times, and loss of situational awareness and control. Fatigue degrades a person's ability to stay awake, alert, and attentive to the demands of controlling their vehicle safely. To make matters worse, fatigue actually impairs our ability to judge just how fatigued we really are.

At any time while traveling, the public could be at risk because their vehicle operator—whether they are an airline pilot, a train engineer, a ship captain, or a motorcoach or truck driver—may not be able to safely control the vehicle due to fatigue.

Other safety-critical workers, such as air traffic controllers, train dispatchers, and maintenance workers, also can degrade transportation safety if they are not fully rested. For example, the Federal Railroad Administration found that fatigue is prevalent throughout the railroad workforce, especially in train crews that are not on fixed work schedules.

But fatigue isn't just a problem for operators or other safety-critical personnel involved in the transportation business. It's a problem we all face.

Driver fatigue contributes to hundreds of thousands of motor vehicle accidents each year. In a recent AAA survey of highway vehicles, for example, 43 percent of U.S. drivers admitted to falling asleep or nodding off while driving at least once in their lifetime.

<u>What can be done?</u>

The NTSB has issued more than 200 safety recommendations addressing fatigue-related problems across all modes of transportation. Addressing the problem of human fatigue in transportation requires a comprehensive approach that focuses on research, education and training, technologies, treatment of sleep disorders, hours-of-service regulations, and on- and off-duty scheduling policies and practices.

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[2] http://www.ntsb.gov/safety/mwl/Pages/mwl1-2016.aspx

Some of our earliest recommendations called for research to better understand the problem of fatigue in transportation, and, over the past three decades, a great deal of research has been done. But research only goes so far; we must implement what we have learned.

All vehicle and vessel operators must be better educated about medical conditions and impairing drugs that can impact the quality and duration of sleep or their on-duty performance. Regulators can help commercial operators, airlines, vessel operators, and rail agencies identify high-risk drivers, pilots, mariners, and operators. They can do so by institutionalizing guidance regarding the identification and treatment of individuals at risk of obstructive sleep apnea and requiring medical screening of employees in safety-critical jobs.

All interstate commercial vehicle carriers should equip their vehicles with electronic logging devices that collect data on driver hours of service in a valid, accurate, and secure manner to enable the carriers and their regulators to monitor and assess hours-of-service compliance. Additional development and implementation of in-vehicle technologies to reduce the occurrence of fatigue-related accidents also improves safety.

Companies must establish fatigue risk management programs and then continually monitor their success to reduce fatigue-related risks for personnel performing safety-critical tasks.

Fatigue risk management programs take a comprehensive, tailored approach to the issue of fatigue within an industry or workplace, helping to address the problem of fatigue in an operational environment. Such programs include policies or practices to address scheduling, attendance, education, medical screening and treatment, personal responsibility during non-work periods, task/workload issues, rest environments, and commuting and/or napping.

Sleep experts say most adults need between 7–9 hours of sleep each night for optimum performance, health, and safety. Data on the habits of workers in different modes of transportation, along with the results of existing fatigue management programs, will allow for better analysis to determine the best fatigue countermeasures to employ in every situation.

Ultimately, fatigue-related accidents can be avoided with a combination of science-based regulations, comprehensive fatigue risk management programs, and individual responsibility.

DOT Response:

The Department concurs with the NTSB's viewpoint that fatigue is a serious safety issue, and DOT continues to take actions that prevent fatigue-related safety lapses and crashes through rulemakings and regulations such as Hours of Service requirements, research, education and training, initiatives to address obstructive sleep apnea (OSA), and scheduling policies and practices. The FAA will be publishing a Notice of Proposed Rulemaking (NPRM) on flight, duty, and rest requirements for ferry flights, is conducting a formal sleep study of aviation maintenance technicians to examine issues related to fatigue risk, expanded the Aviation Medical

Examiner (AME) Refresher Seminar to include the full spectrum of sleep disorders, limited total scheduled duty time for Technical Operations (TO) employees, and provided additional guidance material on Maintenance Fatigue Risk Management activities. FMCSA published the Final Rule on Electronic Logging Devices (ELD) and Hours of Service (HOS) Supporting Documents, and funded research with the National Academies of Science (NAS) to identify optimal research and statistical methodologies to better understand driver fatigue. FRA is drafting a regulation to meet the Rail Safety Improvement Act of 2008 requirement for railroads to include a fatigue management plan in their risk reduction programs. FRA also relaunched their Web site "The Railroaders' Guide to Healthy Sleep." FRA and FMCSA published a joint Advanced Notice of Proposed Rulemaking (ANPRM) regarding obstructive sleep apnea. FTA continues to conduct research and analysis through the Transit Advisory Committee for Safety (TRACS). PHMSA continues to review Control Room Management (CRM) information for compliance with regulatory requirements to reduce fatigue in pipeline control rooms.

Federal Aviation Administration:

Human fatigue affects the safety of the traveling public in all modes of transportation. Twenty percent of the 182 major NTSB aviation investigations completed between 2001 and 2012 identified fatigue as a probable cause, contributing factor, or a finding. The FAA has developed a comprehensive approach to combat fatigue in the aviation industry, focusing on efforts in rulemaking, research, education and training, treatment of sleep disorders, hours-of-service regulations, and on- and off-duty scheduling policies and practices.

Rulemaking

The FAA plans on publishing the Applying the Flight, Duty, and Rest Requirements to Ferry Flights that Follow Domestic, Flag, or Supplemental All-Cargo Operations NPRM. The NPRM will consider whether to require a flightcrew member who accepts an additional assignment for flying under part 91 from the air carrier or from any other air carrier conducting operations under Part 121 or 135 to apply the period of the additional assignment toward any duty period or flight time limitations applicable to the flightcrew member.

We also plan on publishing the Applying the Flight, Duty, and Rest Rules of 14 CFR Part 135 to Tail-End Ferry Operations Advanced NPRM. This notice is expected to examine changing flight, duty, and rest requirements for tail-end ferry flights, including whether a flightcrew member who is employed by an air carrier conducting operations under Part 135, and who accepts an additional assignment for flying under Part 91 from the air carrier or from any other air carrier conducting operations under Part 121 or 135, should apply the period of the additional assignment toward any limitation applicable to the flightcrew member relating to duty periods or flight times under Part 135.

Research

The FAA has supported significant fatigue-related research.

- We have sponsored a multi-year research project examining maintenance fatigue and risk management. As a result of this project, we now have a 2-hour computer-based training on fatigue and fatigue risk management, administered through www.FAASafety.gov. Based on our records, we conservatively estimate that more than 100,000 aviators have completed this training.
- We are currently conducting a formal sleep study of aviation maintenance technicians, to examine issues related to fatigue risk. This topic has not been studied since 1999. Findings from this study will be used to develop a risk-based decision model for aviation organizations to use while planning personnel needs within their work structure. Following development of the model, a formalized process will assist users in transitioning from fatigue awareness training to applying knowledge to the maintenance environment.
- We completed a large-scale baseline fatigue study, which included a fatigue baseline assessment, for ATC and Technical Operations (TO) employees. This study directly led to the implementation of fatigue controls and mitigations in those work environments.
- We are currently updating the guidance material in FAA Order 8900.1, as well as AC 120-72, Maintenance Resource Management Training, to include the latest human factors information and research. This update will include the addition of an AC for Aircraft Maintenance Fatigue Risk Management. These updates are scheduled for informal coordination in June 2016.
- The FAA has also published countless articles in aviation magazines and other publications highlighting fatigue issues and appropriate countermeasures. All resources are publicly available on our Web site.

Education and Training

The FAA has developed and delivered training and other educational materials on fatigue issues for our employees and the aviation community at large.

- Beginning in January 2016, we expanded the Aviation Medical Examiner (AME) Refresher Seminar to include the full spectrum of sleep disorders in our lecture on obstructive sleep apnea.
- In 2014, we published a "Sleep Aids" section in the AME guide outlining concerns associated with sleep aids and listing minimum "no-fly" times following use of the common sleep aids.
- All parts 121, 135 and 91 subpart K air carriers are encouraged to adopt and implement a comprehensive maintenance human factors training program. The FAA Regulatory Guidance Library includes several documents addressing these programs. The FAA

currently accepts these programs through an extensive evaluation process, which includes the requirement to review for a fatigue management program.

- We provide training of Aviation Safety Inspectors on fatigue assessment and countermeasures, in addition to providing training to industry.
- We support a fatigue awareness campaign, including the publication and distribution of extensive signage for maintenance organizations.
- All members of the ATC and TO workforces have been trained in fatigue awareness and countermeasures. Scientists from the FAA's Civil Aerospace Medical Institute conducted pre- and post-tests, and determined a 25 percent improvement in knowledge resulting from the training.
- Since July 2014 we have provided monthly fatigue awareness and countermeasures briefing materials to ATC in the field via the Partnership for Safety monthly national teleconferences.
- We are creating a 'Fully Charged' Alertness web-based application to help employees understand their current alertness levels and make better choices regarding healthy sleep and dealing with sleep disorders.
- We provide additional information and resources, including videos, presentations and training aids, on our Web site.

The FAA has also been involved in fatigue issues at an international level. We were a leading participant in the International Civil Aviation Organization's Flight Operations Panel, which developed a new publication, Fatigue Management Guide for GA (general aviation) Operators. This guide explains how sleep deprivation impacts elements of pilot performance, and suggests fatigue reduction and mitigation strategies. The guide is scheduled for publication in 2016.

Screening Airmen for Obstructive Sleep Apnea (OSA)

Since OSA is a significant cause of excessive daytime sleepiness, the FAA launched a major medical initiative in March 2015, to enhance the identification and encourage treatment of aviators who have OSA. Screening of all airmen presenting for their medical examinations is now mandatory, and closely follows the American Academy of Sleep Medicine Clinical Guideline. Airmen at high risk are referred for more comprehensive evaluation, and treatment is required for moderate to severe cases. In calendar year 2015, 979 airmen were referred for comprehensive evaluation. It is likely that these airmen would have gone unrecognized prior to initiation of the screening program.

On- and Off- Duty Scheduling Policies and Practices

The FAA's Air Traffic Organization Fatigue Risk Management Team has been working with bargaining unit employees from the controllers' unions to collaboratively identify fatigue hazards and manage associated safety risk in air traffic operations. A large-scale baseline fatigue study was completed for ATC, Flight Service, and TO specialists, and a fatigue baseline

assessment was completed. Data collected from these studies yielded recommendations that have led to new controls and mitigations in the ATC and TO work environments.

- In 2014 and 2015, we made changes to FAA Order 7210.3, Facility Operation and Administration, to enhance single person midnight coordination procedures and limit certain shift types, including consecutive midnight shifts, 10-hour midnight shifts, and early day shifts prior to midnight shifts.
- In 2015, we limited total scheduled duty time for TO employees to no more than 14 hours and now require at least 9 hours off between scheduled duty periods.
- We created the 'Fully Charged' culture change initiative designed to provide the field with information to help them better manage fatigue both on and off the job. We also published 11 Fatigue Risk Management Bulletins on specific topics identified as potential fatigue hazards.

Hours of Service Regulations

The FAA is currently creating additional guidance material as AC 120-MFRM (Maintenance Fatigue Risk Management) to include the latest human factors information available for maintenance functions and personnel. We anticipate publishing the guidance by June 2016.

Federal Motor Carrier Safety Administration:

On December 16, 2015, FMCSA published the Electronic Logging Devices and Hours of Service Supporting Documents final rule in the Federal Register. The rule requires most commercial motor vehicles that are required to keep records of duty status (RODS) to use ELDs by December 18, 2017. The requirements for ELDs will improve compliance with the HOS rules, thereby reducing the risk of fatigue-related commercial motor vehicle crashes attributable to violations of the rules. Specifically, the rule: (1) requires new technical specifications for ELDs that address statutory requirements; (2) mandates most drivers currently required to keep RODS to use ELD; (3) clarifies supporting document requirements so that motor carriers and drivers can comply efficiently with HOS regulations; and, (4) adopts both procedural and technical provisions aimed at ensuring that ELDs are not used to harass commercial motor vehicle drivers.

Prior to the completion of the ELD rulemaking, the Agency worked with its Canadian partners to develop the North American Fatigue Management Program (http://www.nafmp.com/en/). The NAFMP is designed to address the issue of driver fatigue with a comprehensive approach that includes:

- Information on how to develop a corporate culture that facilitates reduced driver fatigue;
- Fatigue management education for drivers, drivers' families, carrier executives and managers, shippers/receivers, and dispatchers;

- Information on sleep disorders screening and treatment;
- Driver and trip scheduling information; and,
- Information on Fatigue Management Technologies.

FMCSA, in collaboration with FRA and OST, issued the ANPRM "Evaluation of Safety-Sensitive Personnel for Moderate-to-Severe Obstructive Sleep Apnea." The purpose of the ANPRM is to gather information from interested parties on whether to take regulatory action on sleep apnea and, if so, how to craft the most effective and efficient regulation to address the potential safety risks associated with OSA.

On February 3, 2014, FMCSA provided an update to the NTSB concerning safety recommendation H-10-009, that all motor carriers adopt a fatigue management program based on the North American Fatigue Management Program (NAFMP) guidelines. FMCSA detailed the launch and elements of the NAFMP in its update. However, on May 13, 2014, NTSB responded to FMCSA's request for closure of the safety recommendation by reclassifying it from "Open - Acceptable Response" to "Open - Unacceptable Response."

FMCSA acknowledges the NTSB's concern that a voluntary adoption policy with no monitoring of such a policy's results would not adequately address the problem of fatigued drivers. However, the Agency continues to believe there is an insufficient basis for initiating a rulemaking to mandate that each interstate motor carrier put into place a fatigue management program. A conservative estimate suggests the recommended rulemaking could cost several hundred million dollars per year for the first 2-3 years to train existing drivers and supervisors, followed by training of new drivers and new entrant carriers in each subsequent year. FMCSA anticipates significant challenges in determining the benefits of such a rulemaking to justify the costs of training all drivers and their supervisors, monitoring and enforcing such training, and requiring carriers to change their operating practices/schedules to conform to the lessons learned through a fatigue management program. Therefore, at this time FMCSA does not anticipate promulgating a fatigue management program rulemaking for the trucking and motorcoach industries.

While rulemaking to address fatigue is not under consideration, FMCSA funded research to better understand driver fatigue issues and provide expert direction and support for future agency research and methodologies. The Committee on National Statistics (CNSTAT), a component of the NAS/National Research Council (NRC), conducted a panel study to identify optimal research and statistical methodologies to better understand driver fatigue. This study assessed the large amounts of data already generated by onboard electronic monitoring systems and naturalistic driving studies. NAS informed FMCSA of the panel's findings, conclusions, and recommendations, and plans to release the final report in March, 2016. A key recommendation of the report is for FMCSA to carry out a research program on driver fatigue management and training. Specifically, the research program should include:

- Evaluating the effectiveness of the NAFMP for educating truck and bus drivers in how to modify their behavior to remedy various potential sources of fatigue;
- Determining how effective the NAFMP training modules are in meeting the needs of drivers' employers, including fleet managers, safety and risk managers, dispatchers, driver trainers and other corporate officials (e.g., those conducting carrier-sponsored employee health and wellness programs);
- Evaluating any new education programs regarding sleep apnea that FMCSA has or plans to develop; and
- Examining possibilities for the development and evaluation of incentive based-based programs for improving health and fitness, including regular coaching, assessment and support.

FMCSA will review the full findings and recommendations of the final report and determine the best course forward for further research related to fatigue management.

Federal Railroad Administration:

In response to the Rail Safety Improvement Act of 2008 (RSIA) and based on input from a Railroad Safety Advisory Committee working group, FRA is drafting a proposed regulation to meet the RSIA statutory mandate that requires a railroad to include a fatigue management plan in its risk reduction program. FRA anticipates issuing the proposed regulation in FY 2016, which shall require railroad carriers to develop and submit a Fatigue Risk Management Plan (FRMP). Elements considered in these FRMPs will include: (1) employee education and training; (2) opportunities for identification, diagnosis, and treatment of medical conditions that may affect alertness and fatigue; (3) scheduling practices for employees; and (4) other alertness strategies. . After the final rule is issued, FRA plans to provide railroads with guidance documents to assist them in establishing their FRMPs.

As part of its long-term research emphasis into fatigue in the railroad industry, FRA has employed biomathematical models to examine the schedules of railroad employees involved in human factor-related accidents. In addition, FRA has used railroad data to validate two models in current use and to calibrate the models with one another. The report discussing validation and calibration can be found at:
http://www.fra.dot.gov/eLib/details/L04301#p1_z5_gD_kbiomathematical.

In February 2016, FRA relaunched the Web site "The Railroaders' Guide to Healthy Sleep" (www.railroadersleep.org). It now includes updated content, enhanced features, and mobile optimization. New promotional materials and fact sheets are forthcoming. The implementation team is working with FRA's Office of Public Affairs to increase the site's visibility in the industry and drive more traffic to the Web site.

Additionally, FRA, in collaboration with FMCSA and OST, issued the ANPRM "Evaluation of Safety-Sensitive Personnel for Moderate-to-Severe Obstructive Sleep Apnea." The purpose of the ANPRM is to gather information from interested parties on whether to take regulatory action on sleep apnea and, if so, how to craft the most effective and efficient regulation to address the potential safety risks associated with OSA.

Federal Transit Administration:

The FTA recognizes the importance of developing uniform standards for hours-of-service, fatigue management, and training and certification of personnel who develop work schedules for employees. FTA tasked its Transit Advisory Committee for Safety (TRACS) to conduct the research and analysis necessary to lay a foundation for standards on these subjects, and to develop specific recommendations for establishing a Fatigue Management Program for the Bus and Rail Transit Industry, based on the principles of Safety Management Systems. FTA recently received a report[3] from TRACs and is evaluating the TRACS recommendations.

National Highway Traffic Safety Administration

On November 4th-5th, NHTSA hosted a forum, *Asleep at the Wheel: A Nation of Drowsy Drivers*, during National Drowsy Driving Prevention Week to launch a new drowsy-driving initiative. Experts convened from a wide range of fields, including the sleep sciences, traffic safety, and public health to address the risks, consequences, and countermeasures related to drowsy driving. Panels discussed issues with problem identification, vehicle technology, public awareness and behavior, and public and corporate policy. At the conclusion of the forum, the participants developed a matrix of suggested short- and long-term future research activities in the areas of Education, Vehicle Technology, Policy Development, and Other Drowsy Driving Initiatives[4].

Pipeline and Hazardous Materials Safety Administration:

As part of annual pipeline inspection planning and execution, PHMSA continues to review compliance with Control Room Management (CRM) regulations through the Integrated Inspection (II) screening process. Regions have the discretion to conduct follow-on CRM inspections during subsequent years when risk modeling and screening indicates the need for follow-up inspections. As part of CRM, OPS inspectors evaluate pipeline operator plans and methods for fatigue mitigation which are required under 49 CFR 192.631(d) and 49 CFR 195.446(d).

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[3] Transit Advisory Committee for Safety (TRACS) 14-02 Report. *Establishing a Fatigue Management Program for the Bus and Rail Transit Industry.* Issued 7/30/2015 http://www.fta.dot.gov/documents/TRACS_Fatigue_Report_14-02_Final_(2).pdf

[4]

http://www.nhtsa.gov/nhtsa/symposiums/november2015/assets/Asleep_at_the_Wheel_Closing_Session_Action_Matrix.pdf

PHMSA also provides extensive training on fatigue mitigation inspection strategies to Federal and State inspectors through its Training and Qualifications program, and has developed a public website that contains guidance and other resources related to implementation of the Control Room Management Rule. The fatigue mitigation portion of PHMSA's CRM website provides additional information to supplement inspection guidance and FAQs.[5] It also provides publicly available resources for additional information about fatigue mitigation in general in other industries/modes. PHMSA continues to be engaged in discussion with other modes on Human Factors issues in general, including fatigue, through the DOT Human Factors Coordinating Committee.[6]

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[5] http://primis.phmsa.dot.gov/crm/fm.htm.
[6] http://hfcc.dot.gov/.

2. Improve Rail Transit Safety Oversight[7]

What is the issue?

Every day, millions of people take rail transit to get to or from work, home, or other destinations. Yet oversight of rail transit is unreliable in some cases, increasing the risk of an accident.

Rail transit accidents continue to cause injuries and deaths. For example, the NTSB saw the devastating results of two Chicago Transit Authority (CTA) accidents it investigated in recent years.

On March 24, 2014, CTA train No. 141 collided with the bumping post near the end of the center pocket track at O'Hare Station. The lead car rode over the bumping post and went up an escalator at the end of the track. Thirty-three injured passengers and the injured train operator were taken to the hospital. On September 30, 2013, a set of unoccupied CTA passenger cars collided with CTA passenger train No. 10 at the Harlem-Congress passenger station in Forest Park, Illinois, at about 24 miles per hour. As in the O'Hare accident, 33 passengers and the train operator were taken to local hospitals and later released.

The NTSB has investigated a number of accidents of the Washington Area Metropolitan Transit Authority (WMATA) Metrorail. For example, on June 22, 2009, in Washington, DC, two WMATA Metrorail trains collided, killing nine people and injuring 52. In another WMATA accident, on January 12, 2015, a WMATA Metrorail train stopped after encountering heavy smoke originating from electrical arcing near the third rail south of the L'Enfant Plaza Station in Washington, DC. Ninety-two people were injured in the accident, and one passenger died.

Following the L'Enfant Plaza accident, the NTSB urgently recommended that WMATA Metrorail oversight be moved from the Tri-State Oversight Committee (TOC) to direct federal oversight under the Federal Railroad Administration (FRA), rather than the Federal Transit Administration (FTA).

The FTA relies on state safety oversight agencies; whereas, the FRA directly oversees safety, with power to inspect and enforce federal rules. In several of its audits of WMATA, the FTA acknowledged (before the L'Enfant Plaza investigation) that the TOC was not capable of exercising oversight over WMATA's Metrorail system, thereby compromising safety. In 2013, the FTA notified the TOC that it did not meet MAP-21 requirements and it did not received certification as a state safety oversight agency. Nevertheless, the U.S. Department of Transportation chose to move direct oversight of Metrorail to the FTA, not the FRA.

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[7] http://www.ntsb.gov/safety/mwl/Pages/mwl2-2016.aspx

What can be done?

According to the American Public Transportation Association, the role of mass transit is growing – faster than population growth and faster than highway travel. Metropolitan areas such as Washington, D.C. and New York City are especially dependent on rail transit. That's why it is critically important that rail transit systems be constantly monitored and improved to maintain and enhance safety, to catch small problems before they become big ones, and to provide extra layers of protection against disasters.

Rail transit must be subject to competent oversight bodies that have standards and rules, and the power to enforce these rules. Although each system has unique equipment, operating environments, and challenges, all need strong safety oversight to continue safe operations.

The Metrorail smoke event put a national spotlight on the TOC's inability to oversee Metrorail safety, and on the fact that corrective action was not taken in time, despite warnings from the FTA. It also brought into question the strength of rail transit oversight nationwide.

The NTSB believes the FRA is best positioned to oversee the WMATA Metrorail, but the DOT is moving forward with its plan for FTA oversight. The NTSB will monitor the efficacy of this decision and continue to champion consistently strong oversight for all rail transit agencies.

Rail transit riders deserve strong safety oversight whether in Washington, Chicago, San Francisco, New York, Atlanta, or in any of the dozens of other American cities with rail transit systems.

DOT Response:

On October 9, 2015 the Secretary sent a letter to NTSB affirming our position that FTA should have oversight responsibility over the Washington Area Metropolitan Transit Authority Metrorail (WMATA) system[8]. The Department continues to believe that FTA is best positioned to oversee the safety of our Nation's public transportation transit systems, including WMATA. In order to oversee rail transit, FTA is carrying out a number of activities to establish the policy and regulatory framework to support the safety authorities granted in the Moving Ahead for Progress in the 21st Century (MAP-21) Act. These activities include developing a National Public Transportation Safety Plan, requiring transit agencies to develop safety plans, strengthening state safety oversight, establishing a safety certification training program, and establishing substantive and procedural rules for FTA's administration of the Public Transportation Safety Program.

Federal Transit Administration:

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[8] Letter from Secretary Anthony R Foxx to Honorable Christopher A. Hart, NTSB Chairman on NTSB Recommendations Regarding WMATA. October 9, 2015.
https://www.transportation.gov/sites/dot.gov/files/docs/Outgoing%20Letter%20to%20Chairman%20Hart%20re%20NTSB.pdf

In 2012, MAP-21 authorized a fundamentally new role for FTA: oversight of the safety of public transportation which includes rail transit, bus, paratransit, and certain other forms of public transportation. Since that time, FTA has made significant progress in establishing the policy and regulatory framework to support its new safety authority. The following is a brief summary of the several initiatives underway:

- On February 5, 2016, the FTA proposed the first edition of the National Public Transportation Safety Plan ("National Safety Plan") designed to guide the nationwide effort for managing safety risks across the public transportation industry. *See,* 81 FR 6372-3. In accordance with the mandate at 49 U.S.C. § 5329(b), the document proposes FTA's strategic approach to safety performance, with proposed safety performance criteria for all modes of public transportation and voluntary minimum safety standards for rail transit vehicles used in revenue operations (not otherwise regulated by another Federal agency) and for safety operations. This proposed Plan describes how FTA plans to collect and disseminate safety performance data, and based on that data, set national goals for improving the industry's safety performance. The proposed Plan is based on the principles and methods of Safety Management Systems (SMS) as follows: A formal, top-down, organization-wide approach to managing safety risks and ensuring the effectiveness of a public transportation agency's safety risk mitigation. The docket for public comment on the National Safety Plan is open through April 5, 2016, after which, FTA will summarize and respond to the comments, and issue a final iteration of the National Safety Plan.

- On March 16, 2016, the FTA issued a final rule that transforms and strengthens State Safety Oversight (SSO) of rail fixed guideway public transportation systems, in accordance with the mandate at 49 U.S.C. § 5329(e). *See,* 81 FR 14229. Consistent with the statute, this rule requires financial and legal independence for State Safety Oversight Agencies (SSOAs), strong enforcement authority for the SSOAs, and adequate human and financial resources to oversee the number and complexity of rail fixed guideway systems under the jurisdiction of an SSOA. The new rule at 49 CFR Part 674 replaces the SSO rule at 49 CFR Part 659, which had been in place for twenty years. Under the new SSO rule, FTA approves or disapproves a State's SSO program through a *certification* procedure, and FTA evaluates the effectiveness of SSOAs through annual reports and triennial audits. The *certification* process functions hand-in-hand with the new program of Federal financial assistance for SSOAs conducting safety oversight of rail transit—no longer is State Safety Oversight of rail transit systems an unfunded mandate.

- Also, on February 27, 2015, the FTA issued *interim provisions* for the Public Transportation Safety Training Certification ("Training Certification") program, mandated by 49 U.S.C. § 5329(c), which took effect on May 28, 2015. *See* 80 FR 10619-26. These *interim provisions* set a mandatory curriculum and training requirements for Federal and SSOA personnel who are directly responsible for safety oversight of public transportation systems, and the SSOA

personnel who conduct safety audits and examinations of rail transit systems, for the purpose of enhancing their technical proficiencies. On December 3, 2015, the FTA issued an NPRM proposing to adopt the *interim provisions* as the initial regulatory training requirements for industry personnel responsible for safety oversight of public transportation systems, with additional requirements for recordkeeping and compliance. FTA expects to issue final rules for the Training Certification program in summer 2016.

- On February 5, 2016, the FTA issued an NPRM for Public Transportation Agency Safety Plans ("Agency Safety Plans") to require all operators of public transportation that receive FTA grant funds to develop and carry out Agency Safety Plans based on the principles and methods of SMS. *See* 81 FR 6344-71. As mandated by 49 U.S.C. § 5329(d), the rules for Agency Safety Plans would require transit agencies to set performance targets based on the safety performance criteria under the National Safety Plan. Additionally, under the Agency Safety Plan rulemaking, every public transportation agency would be obliged to establish a process and timeline for annual review and revisions to its plan, as necessary or appropriate. The docket for public comment on the Agency Safety Plan rulemaking is open through April 5, 2016.

- Finally, on August 14, 2015, the FTA issued an NPRM to set substantive and procedural rules for FTA's administration of the Public Transportation Safety Program mandated by 49 U.S.C. § 5329 (the "Safety Program" rule). *See* 80 FR 48794-803. The Safety Program rule proposed to formally adopt SMS as the foundation for FTA's approach to safety oversight, and all future safety policy and rulemaking; set the procedures whereby FTA will conduct inspections, investigations, audits, examinations, and testing of facilities, equipment, rolling stock, and the operations of public transportation systems, on its own initiative; and set the procedures where FTA may take enforcement actions against public transportation systems, States, and SSOAs, including the issuance of directives or advisories, directing the use of Federal financial assistance, and withholding Federal financial assistance. FTA expects to issue the final Safety Program rule in summer 2016.

3. **Promote Availability of Collision Avoidance Technologies in Highway Vehicles**[9]

<u>What is the issue?</u>

Motor vehicle crashes continue to be a leading cause of death and injuries in the United States, killing more than 32,000 each year on average. Yet currently available technologies could prevent many crashes.

Many passenger and commercial vehicle collisions occur simply because drivers aren't paying attention or are otherwise distracted.

For example, a 2007 National Highway Traffic Safety Administration (NHTSA) study found that the primary reason for rear-end crashes is driver inattention. Nearly half of all two-vehicle crashes are rear-end crashes. In this study, nearly nine out of ten times, a driver failed to attend to the traffic ahead.

Driver inattention played a critical role in nine crashes the NTSB investigated between 2012-2014. These rear-end crashes killed 28 people and injured 90 more. All of them resulted from a driver failing to respond in time to an obstacle ahead.

For example, on March 3, 2013, in Elizabethtown, Kentucky, a truck-tractor in combination with a semitrailer struck a sport utility vehicle (SUV) after the driver did not slowdown in time to avoid striking the SUV. A post-crash fire ensued, killing six of the SUV's eight occupants.

Crashes involving sudden roadway departures are also common and almost entirely preventable. In one crash in Dolan Springs, Arizona, in 2009, the NTSB found that a distracted bus driver inadvertently drifted into another lane of traffic, which led to a series of events that culminated in a crash. Seven bus passengers were killed, and nine other bus passengers and the driver were injured.

<u>What can be done?</u>

A variety of in-vehicle collision avoidance technologies—such as collision warning, adaptive cruise control, autonomous emergency braking (AEB), lane departure warning, blind spot detection, and advanced lighting technology—could help to mitigate or even prevent many such crashes.

These technologies help drivers by improving the view of the roadway, alerting drivers of impending danger ahead (a sudden stopped vehicle), or warning a driver if the driver performs an unusual maneuver that could increase the risk of a crash (such as a sudden change in lanes). Some technologies even initiate braking if drivers don't or can't.

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[9] http://www.ntsb.gov/safety/mwl/Pages/mwl3-2016.aspx

Collision avoidance technologies can offer a long-term reduction in fatalities and injuries.

- *A 2011 study by the Insurance Institute for Highway Safety suggests that a combination of four technologies—side view assist, forward collision warning/mitigation, lane departure warning/prevention, and adaptive headlights—on all vehicles might prevent or mitigate up to 1.8 million crashes each year, including 10,238 fatal crashes.*

- *In 2012, NHTSA predicted that AEB (meeting certain requirements) could prevent 13,000–28,000 minor injuries and 500–700 serious injuries resulting from rear-end crashes, and save as many as 65 lives each year.*

The NTSB has encouraged technological countermeasures to prevent or mitigate crashes since 1995. In 2001, the NTSB released a special investigation report that focused on how collision avoidance technologies could mitigate or prevent passenger and commercial vehicle rear-end crashes. The NTSB issued an update to that report in 2015 that reiterated its support for forward collision avoidance systems.

Although some passenger vehicle manufacturers offer collision avoidance technologies as standard features in many of their models, this life-saving technology is frequently only offered as optional equipment—and even then, it is often bundled with other non-safety features (such as moon roofs or leather seats). The NTSB believes that not only should more automakers offer collision avoidance technologies as standard features in their vehicles, but that consumers should not have to purchase a luxury option package to get the safety benefits of these technologies.

Federal agencies must continue to work to develop performance standards for these technologies and rate their effectiveness. In late 2015, NHTSA announced it planned to do just that. But we must keep up the pressure to ensure the plan turns into reality—that the 5-Star Safety Rating system includes such ratings and that those ratings are then displayed on vehicle window stickers so that prospective purchasers have the information they need to make the safest choice.

Ten major passenger vehicle manufacturers committed in 2015 to making AEB a standard feature on all new vehicles. Yet this is just a first step toward preventing crashes. Saving lives and reducing injuries from crashes depends on the broad deployment of these technologies in all new passenger and commercial vehicles.

DOT Response:

Reducing injuries and fatalities due to vehicle crashes on our Nation's roadways is critical to improving safety on the Nation's roadways, and collision avoidance technologies provide a promising option to help reduce or even prevent these crashes. Therefore, the Department is pursuing a number of activities to promote the availability of collision avoidance technologies in highway vehicles. FMCSA is funding a work zone safety technology research project, and it will

encourage the use of technology through its *Beyond Compliance* initiative. FMCSA also grants temporary exemptions to allow certain safety technologies to be mounted on windshields, and will amend 49 CFR Part 393 for further device exemptions in response to the Fixing America's Surface Transportation (FAST) Act Section 5301, - Windshield Technology. NHTSA added two automatic emergency braking (AEB) systems to its New Car Assessment Program (NCAP) and will update its 5-Star Rating System to include automatic emergency braking as a recommended safety technology starting in model year 2018. Through dialogue with US DOT, ten automakers also voluntarily agreed to add AEB as a standard feature in new light-duty vehicles. Beyond AEBs, NHTSA in conjunction with the Intelligent Transportation Systems Joint Program Office (ITS JPO) is taking a series of steps to accelerate the development of advanced safety technologies such as vehicle-to-vehicle communications and autonomous driving, including a forthcoming rulemaking on vehicle-to-vehicle (V2V) safety communications. The ITS JPO, in conjunction with FHWA, FTA, and the Office of the Assistant Secretary for Research and Technology (OST-R), promotes V2V and Vehicle to Infrastructure (V2I) technology by researching foundational V2I technologies to enable interoperable safety applications, supporting demonstration programs on collision avoidance technologies on transit buses, and ensuring access to radio spectrum resources for safety-critical applications.

Federal Motor Carrier Safety Administration:

FMCSA funded a research project to conduct a retrospective effectiveness study on three commonly deployed onboard safety system (OBSS) types using data previously acquired directly from participating motor carriers. These OBSS technologies included lane departure warning (LDW), roll stability control (RSC), and forward collision warning (FCW) systems. The study assessed the effectiveness of these three different OBSS types installed on Class 7 and 8 trucks as they operated in their normal revenue-producing routes. Crash data acquired from 14 carriers representing small, medium, and large carriers hauling a variety of commodities included a total of 88,112 carrier crash records—U.S. Department of Transportation (DOT) reportable accidents as well as minor incidents—and 151,624 truck-years of operation that represented 13 billion miles traveled.

The final report (FMCSA-RRT-12-012, October 2013) concluded that the benefit-cost analyses clearly showed the estimated benefits of LDW and RSC systems deployed at participating fleets outweighed the estimated costs. However, the analysis of the fleet crash data using the same methodology did not show a statistically significant difference in FCW-related crash occurrence rates between vehicles with or without an FCW system installed. Retrospectively, this result was primarily attributed to the lack of sufficient data (in terms of number of trucks with a deployed FCW system in the dataset) to be able to detect safety benefits with statistical significance at the observed level. Focus groups were also conducted with drivers and safety managers who had experience with LDW, RSC, or FCW systems. Drivers' and safety managers' opinions and perceptions of each OBSS type were generally very positive.

While FMCSA does not require the use of such safety technologies, the Federal Motor Carrier Safety Regulations (FMCSRs) allow the use of additional equipment and accessories, not inconsistent with or prohibited by the regulations, provided such equipment and accessories do not decrease the safety of operation of the motor vehicles on which they are used. In addition, it is expected that the use of such technology will encouraged through FMCSA's *Beyond Compliance* initiative under the FAST Act § 5222. Through this effort FMCSA is working with stakeholders to identify advanced safety technology and management practices that provide improved commercial vehicle safety by going beyond the regulatory requirements and how best to give these carriers credit for their efforts.

In 2013, there were 527 fatal motor vehicle crashes in roadway work zones, and 27.7 percent involved at least one commercial motor vehicle. FMCSA is funding work zone safety technology research with the goal of studying technologies that can mitigate commercial motor vehicle crashes in work zones by facilitating Federal, State, and industry stakeholder collaboration; developing data provision protocols for work zone information; and, utilizing the Commercial Motor Vehicle Roadside Technology Consortium (CMVRTC) to conduct supporting research. FMCSA has identified technologies that could be used to provide drivers an in-cab warning of an upcoming work zone. A truck's Commercial Mobile Radio Services (CMRS) system could be equipped with an application to provide this in-cab alert. Using information supplied by a State to a CMRS provider about location of the work zone and the resulting congestion, the application would give an alert to the driver at a designated point upstream of the work zone. This equipment would send alerts to drivers whose vehicles are equipped with compatible receivers.

Section 393.60(e)(1) of the FMCSRs prohibits the obstruction of the driver's field of view by devices mounted at the top of the windshield. Antennas, transponders and similar devices (devices) must not be mounted more than 152 mm (6 inches) below the upper edge of the windshield. These devices must be located outside the area swept by the windshield wipers and outside the driver's sight lines to the road and highway signs and signals. However, over the past years, FMCSA has granted temporary exemptions to allow certain safety technologies (e.g., video event recorders, lane departure warning system sensors) to be mounted within the swept area of the windshield. In granting these temporary exemptions, FMCSA has determined that the safety performance of motor carriers during the exemption period will likely achieve a level of safety that is equivalent to, or greater than, the level of safety achieved without the exemption.

In response to Section 5301 of the FAST Act, "Windshield Technology," FMCSA will be amending 49 CFR 393.60(e) to exempt from that section the voluntary mounting of certain vehicle safety technologies including fleet-related incident management systems, performance or behavior management systems, speed management systems, lane departure warning systems,

forward collision warning or mitigation systems, and active cruise control systems. FMCSA believes that this amendment will result in a greater adoption of these safety technologies in commercial motor vehicles, resulting in increased safety to the general public.

National Highway Traffic Safety Administration:

NHTSA continues to encourage development and commercialization of additional promising safety-related technologies of vehicle automation through its recommendation of two automatic emergency braking (AEB) systems – crash imminent braking (CIB) and dynamic brake support (DBS). According to NHTSA data, one-third of all police-reported crashes in 2013 involved a rear-end collision with another vehicle at the start of the crash. The agency also found that a large number of drivers involved in rear-end crashes either did not apply the brakes at all or did not apply the brakes fully prior to the crash. Crash imminent braking and dynamic brake support systems can intervene by automatically applying the vehicle's brakes or supplementing the driver's braking effort to mitigate the severity of the crash or to avoid it altogether. Secretary Anthony Foxx announced in January 2015 that NHTSA added these two cutting-edge automatic emergency braking systems to the recommended advanced safety features included under its New Car Assessment Program (NCAP). On November 2, 2015 NHTSA announced that beginning with model year 2018, the agency will update its 5-Star Rating System to include automatic emergency braking as a recommended safety technology.

These AEB systems, along with promising innovations such as vehicle-to-vehicle communications (V2V) and automated vehicle technologies hold great promise to save even more lives and prevent even more crashes, building upon the successes of crashworthiness and crash avoidance technologies currently available in vehicles today. The agency developed a detailed target population in the in the June 2012 automatic emergency braking research report, finding that 910,000 crashes per year could potentially be avoided or mitigated. These crashes involve an estimated 2,700,000 persons per year, and a total annual cost of $47 billion[10]. Additionally, DOT analysis indicates that a fully mature V2V system could potentially address:

- An estimated 4,409,000 police-reported or 79 percent of all vehicle target crashes,
- 4,336,000 police-reported or 81 percent of all light-vehicle target crashes, and
- 267,000 police-reported or 81 percent of all heavy-truck target crashes annually[11].

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[10] Automatic Emergency Braking System (AEB) Research Report. NHTSA Report, August 2014. Pg. 9 https://www.regulations.gov/contentStreamer?documentId=NHTSA-2012-0057-0037&attachmentNumber=2&disposition=attachment&contentType=pdf

[11] Vehicle-to-Vehicle Communications: Readiness of V2V Technology for Application. NHTSA Report, August 2014. Pg. 40 https://www.regulations.gov/contentStreamer?documentId=NHTSA-2014-0022-0001&attachmentNumber=1&disposition=attachment&contentType=pdf,

As these technologies mature, NHTSA continues to accelerate its push on innovative and effective solutions to reduce the staggering toll of motor vehicle crashes in the U.S. through our research, regulatory, and consumer information programs.

To help the public better understand how AEB works, the agency has created a new AEB Web site on www.safercar.gov/AEB. The page has a compelling video[12] depicting a scenario where AEB is used to prevent a crash, a demonstration depicting the two types of AEB applications, and information about the current state of the technology.

On March 17, NHTSA and the IIHS announced a historic commitment by 20 automakers representing more than 99 percent of the U.S. auto market to make automatic emergency braking a standard feature on virtually all new cars no later than NHTSA's 2022 reporting year, which begins September 1, 2022. NHTSA estimates that the agreement will make AEB standard on new cars three years faster than could be achieved through the formal regulatory process. During those three years, according to IIHS estimates, the commitment will prevent 28,000 crashes and 12,000 injuries. The agency first included recommended other advanced safety technologies as part of the 5-Star Rating System upgrade in 2011. The list first included electronic stability control (ESC), forward collision warning, and lane departure warning. In 2014, when ESC became mandatory for all new light vehicles, NHTSA replaced ESC with another technology, rearview video systems. NHTSA intends to remove rearview video systems as a recommended technology in model year 2019, when the technology will be standard equipment on all new light vehicles.

In May 2015 Secretary Foxx announced a series of steps DOT will take to accelerate the development of advanced safety technologies such as vehicle-to-vehicle communications and autonomous driving. NHTSA is also completing a proposed rulemaking to require transmitters for vehicle-to-vehicle safety communications in new cars, and to identify and address potential obstacles to safety innovations within its existing regulations.

Federal Highway Administration:

ITS JPO coordinates the ITS program and initiatives for the DOT through the modal administrations. One area of focus is Vehicle-to-Infrastructure (V2I) safety research, including crash prevention and crash avoidance systems. In 2014, the Federal Highway Administration entered into a cooperative agreement with the Crash Avoidance Metrics Partners, LLC (CAMP) to develop, test, and evaluate a number of V2I applications, including a number of V2I safety applications. CAMP formed the V2I Consortium, comprising of light vehicle and heavy vehicle manufacturers, which selected safety applications for prototype development: red light violation warning, curve speed warning, and reduced speed zone warning. Development of the prototype

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[12] Automatic Emergency Braking. YouTube video on SaferCarTV. NHTSA Sept 18 2015
https://www.youtube.com/watch?v=Src2jhS4wcA

applications was completed in November 2015, with final objective tests completed in February 2016. A demonstration of V2I safety applications will be made in April 2016 to the Connected Vehicle Pilot sites (New York City, Wyoming, and Tampa, Florida) and members of the V2I Deployment Coalition (State departments of transportation).

Another area being addressed is research on the foundational V2I technologies to enable interoperable safety applications nationally and across jurisdictional lines (communications, mapping, and positioning) and developing materials to support V2I deployment. Through the National Cooperative Highway Research Program, a project is near completion to evaluate and document agency benefits and costs of connected vehicles in order to assist with deployment decisions by State and local departments of transportation (NCHRP 03-101, Costs and Benefits of Public-Sector Deployment of Vehicle to Infrastructure Technologies).

<u>Federal Transit Administration</u>:

FTA has worked with ITS JPO for a number of years in support of demonstration programs on Collision Avoidance Technologies for Transit Buses. The most notable programs include research on Connected Vehicle Technology and the development and evaluation of research pertaining to Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) technologies. The vision for Transit V2V research is to apply connected vehicle technologies to develop safety, mobility, and environmental applications that address transit needs and priorities while providing interoperability and coexistence with connected-vehicle equipped cars and trucks.

4. **Strengthen Occupant Protection**[13]

What is the issue?

The NTSB has investigated many accidents where improved occupant protection systems—which includes seat belts, child restraints, and the traveling compartment or vehicle body—could have reduced injuries and saved lives.

In cars, restraint use has been required in most states for more than 20 years. Yet, in 2013, nearly 50 percent of the more than 20,000 fatally injured vehicle occupants were found to be unrestrained.

While the daytime seat belt use rate for front seat occupants in the United States is 87 percent, seat belt use is significantly lower in states without primary enforcement laws and for back seat passengers. Only 22 states and the District of Columbia have primary enforcement seat belt laws that apply to all seating positions, and New Hampshire has no adult seat belt law.

Recent NTSB investigations have also highlighted the importance of proper seat belt use and readily accessible and identifiable evacuation routes on larger passenger vehicles, such as school buses, motorcoaches, and other commercial vehicles.

In commercial aviation, the NTSB saw how a lack of restraint use led to some tragic consequences in San Francisco in 2013 as a result of the crash of Asiana flight 214. While 99 percent of passengers survived the Asiana accident, two of the three fatally injured passengers were ejected from the airplane because they were unrestrained.

While we are required to secure our luggage and even small items such as snacks and beverages during take-off and landing, the Federal Aviation Administration exempts the most vulnerable passengers—children under age 2—allowing them to travel unrestrained, on an adult's lap. And when accidents occur, the NTSB notes that problems with evacuation decision making and execution continue to exist among cockpit and cabin crews.

People involved in general aviation accidents have suffered serious and fatal injuries as a result of shoulder harnesses not being installed on the aircraft, a seat belt failing, or occupants simply choosing to not wear their seat belts.

In train accidents, the NTSB has seen occupant ejections that might have been prevented with better compartment design. Additionally, investigations have revealed that better evacuation procedures could have minimized injuries and prevented deaths.

What can be done?

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[13] http://www.ntsb.gov/safety/mwl/Pages/mwl4-2016.aspx

To minimize deaths and injuries, we need to see increased use of existing restraint systems, and better design and implementation of occupant protection systems that preserves survivable space and ensures ease of evacuation—in all modes of transportation.

The first step to strengthening occupant protection in aviation and on roadways is to increase use of available occupant restraint systems. In addition, we need improved design of occupant protection systems and implementation of evacuation procedures.

In motor vehicles, we need to continue to increase proper seat belt and child restraint use. For children, the correct use of a child restraint system can mean the difference between life and death. When used correctly, child safety seats can reduce fatal injury by 71 percent for infants (under 1 year old) and by 54 percent for toddlers (1 to 4 years old). Properly worn lap/shoulder seat belts reduce the risk of fatal injury to occupants (age 5 and older) of passenger cars by about 45 percent.

In order to increase seat belt and child restraint use in motor vehicles, we must take a three-pronged approach: legislation, enforcement, and education. Strong occupant restraint laws are critical. Primary enforcement sends a message to motorists that seat belt use is an important safety issue. Education campaigns about the benefits of seat belt and child restraint use enhance user knowledge about these issues and encourage proper use in all vehicles. For larger passenger vehicles, pre-trip briefings and training on the proper use of available restraints and evacuation routes are vital.

In the air, all occupants are best protected when using a restraint, regardless of the aircraft type. General aviation pilots and passengers should use shoulder restraints whenever possible, and we should all be as diligent in securing our small children in an appropriately-sized restraint as we are in our passenger cars. It is also critical that commercial flight and cabin crews have proper training and procedures to conduct timely and professional evacuations when conditions warrant.

On trains, protecting passengers and crews from injury requires keeping the railcars' windows intact and maintaining their structural integrity during an accident. Railcar performance in accidents can be improved. Regulators and manufacturers can make a difference by incorporating design elements that optimize crashworthiness and enhance the ease of evacuation when there is an emergency.

<u>DOT Response</u>:

Occupant protection measures, including seat belts, child restraints, and improved traveling compartments and vehicles, have an important safety role in reducing the risk of injuries and fatalities. DOT activities such as rulemakings, collaboration with stakeholders, education and outreach, and research continue to focus on occupant protection to improve transportation safety. FAA published a final rule on child safety seats on airplanes, and collaborated with NHTSA to

have a uniform performance standard for child restraint systems. FMCSA is working on a rulemaking to consider requiring all occupants of property-carrying commercial motor vehicles to use available seat belts. FMCSA also updated its Web site materials related to motorcoach safety features to include NHTSA's revised final rule that mandates a 3-point restraint system for new over-the-road buses. FRA is conducting research on window glazing systems and passenger equipment sidewall structures, and developed proposed regulations for alternative crashworthiness standards for passenger equipment. FTA is funding a demonstration project for innovative front-end bumper designs for light rail vehicles, continues to encourage public transportation agencies to adopt existing voluntary standards, and will review the efficacy of these existing standards for crashworthiness as part of a large study on safety standards and protocols as required by the FAST Act. NHTSA held a public meeting on school bus occupant protection, is conducting research to improve school bus safety data, and is coordinating with safety advocates to determine how to overcome financial barriers to seat belts on school buses. NHTSA also proposed changes to its 5-Star Safety Ratings by adding an additional crash test and using new and more human-like crash test dummies to measure occupant protection, and announced a national advertising campaign aimed at parents of children ages 8-14 to make sure kids are properly wearing seat belts.

Federal Aviation Administration:

The FAA has long standing regulations regarding the protection of passengers in commercial and private aircraft, based on the operation of the aircraft. The most recent aircraft accident involving passengers and the use of seat belts was the Asiana flight 214 accident. According to the NTSB report, 99 percent of the passengers survived the accident and two of the three fatally injured passengers were ejected from the airplane due to being unrestrained. We are constantly addressing new issues as they arise.

Securing the Flying Public

On September 30, 2015, the FAA published the Disclosure of Seat Dimensions to Facilitate Use of Child Safety Seats on Airplanes During Passenger-Carrying Operations Final Rule (80 FR 58575). The final rule requires air carriers conducting domestic, flag, and supplemental operations to make available on their Web sites information to enable passengers to determine which child restraint system (CRS) can be used on airplanes in these operations. Specifically, this final rule requires air carriers to make available on their Web sites the width of the narrowest and widest passenger seats in each class of service for each make, model and series of airplane used in passenger-carrying operations. This rule does not affect existing regulations regarding the use of child restraint systems on board airplanes or a passenger under the age of 2 traveling onboard aircraft with or without the use of a CRS. In support of this rule, the FAA issued an AC, InFO, and updated FAA Order 8900.1.

The FAA and the National Highway Traffic Safety Administration (NHTSA) have agreed upon a single government performance standard that will satisfy both aviation and highway safety requirements for CRSs (Federal Motor Vehicle Safety Standard No. 213, § 571.213). Information regarding most CRS manufacturers is maintained at the NHTSA Web site: www.safercar.gov/parents/CarSeats/Car-Seat-Ratings-Ease-Of-Use.htm.

To accommodate evolving cabin designs, the FAA issued Special Condition 25-580-SC, Boeing Model 787-9 Dynamic Test Requirements for Single-Occupant Oblique (Side-Facing) Seats with Airbag Devices on April 28, 2015 (80 FR 23441). This special condition addresses seats installed at an angle greater than 18 degrees up to 46 degrees to the centerline of the airplane and lateral occupant loading. We are additionally conducting research on non-traditional seating orientation to identify the significant injury mechanisms when the body is loaded laterally.

Federal Motor Carrier Safety Administration:

On November 25, 2013, NHTSA published a final rule updating Section 571.208 of Title 49, Code of Federal Regulations (i.e., Federal Motor Vehicle Safety Standard (FMVSS) No. 208, Occupant Crash Protection). NHTSA revised FMVSS No. 208 to mandate that a lap and shoulder seat belt (3-point restraint system) be provided for each passenger seating position in (a) all new over-the-road buses and (b) new buses other than over-the-road buses with a gross vehicle weight rating (GVWR) greater than 11,793 kilograms (26,000 pounds). The effective date of the revision to FMVSS No. 208 is November 28, 2016. FMCSA will amend 49 CFR Part 393 to cross-reference the NHTSA requirement to ensure motor carriers maintain the new restraints.

Prior to receiving notification of safety recommendation H-15-015, FMCSA had already committed resources to updating the materials available on its Web site related to motorcoach safety features to include information concerning three-point restraint systems on motorcoaches. The update is scheduled to be completed prior to the effective date of NHTSA's rulemaking for FMVSS No. 208.

FMCSA is continuing its work on a rulemaking that would revise the Federal Motor Carrier Safety Regulations (FMCSR) to require passengers in the cab of property-carrying commercial motor vehicles (CMV) use the seat belt assembly whenever the vehicles are operated on public roads. FMCSA published the NPRM on December 10, 2015. In 2013, 17 out of 348 (4.9%) non-driver occupants of large trucks involved in fatal crashes who were wearing seat belts were killed, compared with 30 out of 122 (24.6%) non-driver occupants who were not wearing a lap and or shoulder belt. Sixteen of these 30 were totally or partially ejected from the truck. FMCSA believes that some of these fatalities could have been prevented if this regulation had been in place. FMCSA is reviewing comments received under the NPRM and anticipates publication of the final rule by September 2016.

To date, FMCSA has developed the Basic Plan, which was published in the Federal Register; published safety-related information and a video for travel planners and passengers on the 'Look Before You Book' page on its Web site; created the SaferBus application for iOS and Android devices providing quick access to carrier-specific Behavioral Analysis and Safety Improvement Categories (BASIC) percentiles and other safety information; communicated with passenger carriers requesting that they post the video on their Web sites; and, encouraged motorcoach operators use of videos to disseminate safety information to passengers.

FMCSA will continue to encourage passenger carriers to voluntarily provide safety-related information to passengers and seek technological solutions to delivering safety information to passengers without requiring the driver to present pre-trip safety briefings. While there are concerns regarding the cost/benefits of a rulemaking that would require passenger carriers to provide passengers with pre-trip safety information, FMCSA plans to publish an ANPRM to solicit input from all stakeholders about a viable rulemaking approach.

<u>Federal Railroad Administration</u>:

Window Glazing and Railcar Performance in an Accident

FRA's extensive research plan on window glazing systems will provide performance data on glazing retention and passenger containment, engineering evaluation of existing and potential designs and design methodologies for window glazing systems, and investigation and application of practical testing metrics and methodologies to assess and quantify containment capabilities. Based on this research, FRA plans to assess the relative effectiveness of design methodologies that enhance containment capabilities and improve the ability of the glazing system to provide emergency egress and rescue access in a way that does not compromise safety and continues its intended purpose as a window. FRA will then be able to determine whether regulatory changes are reasonable and practical.

DOT's John A. Volpe National Transportation Systems Center (Volpe Center), began work September 23, 2015, that includes a: (1) review of current glazing regulations and the competing practical requirements placed on glazing systems; (2) review of recent accidents in which passenger ejection from window openings due to dislodged glazing panes was the cause of fatalities or injuries; and (3) a research proposal to define the problem, assess current glazing performance, and recommend prototype glazing system modifications that would improve performance.

To expedite the research and broaden its scope, FRA contracted additional technical support to develop engineering requirements, survey existing design strategies worldwide, and assess the effectiveness of these strategies in meeting requirements. Engineering requirements will address

manufacturing, service, maintenance, and safety. The assessments are expected to rank existing and proposed design strategies with explanations for the rankings. Potential follow-on activities include development of a prototype of the most promising design strategy, analysis of the compliance of the prototype with the engineering requirements and prototype testing to demonstrate its effectiveness.

On December 2, 2014, the NTSB issued Recommendation R-14-74, recommending that FRA develop certain performance requirements to "ensure that windows (e.g., glazing, gaskets, and any retention hardware) are retained in the window opening structure during an accident" to prevent against occupant ejection in this manner. Recommendation R-14-74 was issued following the December 1, 2013, Metro-North Railroad (Metro-North) accident, which resulted in four fatalities. As discussed in this section, FRA is taking steps to address this recommendation. However, the Metro-North accident was the result of over-speed.[14] Implementation of positive train control should eliminate over-speed occurrences on passenger service, thereby reducing the likelihood of rollover accidents and fatalities due to ejection through window openings similar to the events involved in the Metro-North accident.

FRA is currently conducting research on passenger equipment sidewall structure. However, current crashworthiness research emphasis is greater in other areas, such as glazing integrity. Because glazing is attached to the car-body sidewall, it is important that the glazing integrity and sidewall structure research efforts be coordinated.

FRA has developed proposed regulations for Tier III equipment (equipment rated to operate at speeds between 150 mph and 220 miles per hour or mph) and complementary regulations for Tier I passenger equipment (equipment rated to operate below 125 mph) designed to alternative crashworthiness standards. In both cases, the technical criteria for compliance demonstration is derived from established international standards and significant research and testing performed by both the industry, FRA, and the Volpe Center over the past 30 years. The proposed regulations would allow the industry greater flexibility to use contemporary design techniques and more fully apply emerging technology, including crash energy management, without requiring a waiver of compliance for operating the equipment. FRA expects that this flexibility will result in passenger equipment designs incorporating novel approaches to safety improvement that will address the NTSB's concerns.

Federal Transit Administration:

FTA encourages all public transportation agencies to adopt existing voluntary standards that address crashworthiness and strengthen occupant protection. On February 5, 2016, FTA announced the availability of its proposed National Public Transportation Safety Plan ("National

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[14] http://www.ntsb.gov/investigations/AccidentReports/Pages/RAB1412.aspx

Safety Plan")[15]. As part of the National Safety Plan, FTA is strongly encouraging all rail fixed guideway public transportation agencies to voluntarily comply with two sets of consensus-based railcar crashworthiness standards issued by the American Society of Mechanical Engineers (ASME):

- The Safety Standard for Structural Requirements for Heavy Rail Vehicles (ASME RT-1 2008)
- The Safety Standard for Structural Requirements for Light Rail Vehicles (ASME RT-1 2009)[16]

Also, in accordance with Section 3020(a)(2)(C)(iv) of the FAST Act (Pub. L. 114-94; Dec. 4, 2015), FTA will review the efficacy of these ASME standards for crashworthiness as part of a larger study of a number of safety standards and protocols used in public transportation systems across the United States. Once completed, FTA will consult with the transit industry and the public on the need to establish minimum Federal standards for the crashworthiness of rail transit vehicles.

Additionally, FTA is currently funding a pilot demonstration project at Sacramento Regional Transit District to develop, test and demonstrate an innovative front-end bumper design for light rail vehicles that operate in a shared right-of-way environment. The technology is designed to improve safety, reduce injuries and minimize the impact of collisions with automobiles, pedestrians and bicyclists. FTA will convey the results of testing and validation throughout the light rail community.

National Highway Traffic Safety Administration:

On July 23rd, 2015, NHTSA held a public meeting, *School Bus Occupant Protection: Taking Safety to a New Level.*[17] The event was designed to update the current state of knowledge in recent advances in the technology of three-point belt systems, identify operational and policy challenges and solutions, and explore innovative funding approaches that could serve as a catalyst for change.

As follow up to that meeting, Administrator Mark Rosekind announced a series of activities during his speech to the National Association for Pupil Transportation on November 8, 2015.

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[15] Proposed National Public Transportation Safety Plan. Federal Transit Administration, 2016 http://www.fta.dot.gov/documents/National_Public_Transportation_Safety_Plan.pdf

[16] Safety Standards for Structural Requirements for Heavy Rail and Light Rail Transit Vehicles. American Society of Mechanical Engineers. http://files.asme.org/Catalog/Codes/PrintBook/28205.pdf

[17] School Bus Occupant Protection: Taking Safety to a New Level Conference event from NHTSA July 23rd, 2015. http://www.nhtsa.gov/nhtsa/symposiums/july2015/index.html

- A series of research projects to improve school bus safety data, particularly data on the safety benefits of seat belts, including an assessment of the safety benefits in jurisdictions that currently require seat belts, and gathering data on whether seat belt requirements reduce the safety risks from driver distraction.
- Coordination with safety advocates and other entities to determine how NHTSA might help overcome the financial barriers to making seat belts universally available to students.
- A letter to governors of each of the six states that require seat belts on school buses asking them to nominate one participant from state government and one from a local school district to provide recommendations to NHTSA as to best start a nationwide movement.

On December 8, the U.S. DOT proposed high-tech changes to the NHTSA's 5-Star Safety Ratings for new vehicles. The planned changes will improve on the well-known safety ratings by adding an additional crash test, using new and more human-like crash test dummies, rating crash-avoidance advanced technologies, and assessing pedestrian protection. The proposed changes will give consumers even better information to help them choose a safe vehicle, and will encourage manufacturers to produce vehicles with better crash protection and new technology innovations that will save lives.

The planned changes to the 5-Star Safety Ratings system[18] include:

- A new 5-Star Safety Ratings system, which will, for the first time, encompass assessment of crash-avoidance and advanced technologies as well as pedestrian protection;
- New tests to assess how well vehicles protect pedestrians from head, leg and pelvic injuries that occur when a pedestrian is struck by a vehicle;
- A new frontal oblique crash test that measures how well vehicles protect occupants in an angled frontal crash;
- An improved full frontal barrier crash test to drive safety improvements for rear seat occupants;
- New crash test dummies, including the Test device for Human Occupant Restraint, (THOR) and WorldSID, that will provide vastly improved data on the effects a crash is likely to have on the human body;
- An assessment of additional crash-avoidance and advanced technologies that offer drivers the most potential for avoiding or mitigating crashes;
- Use of half-star increments to provide consumers more discriminating information about vehicle safety performance; and

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[18] For the planned changes see the Federal Register Vol 80 No 241 December 16, 2015 available at https://www.gpo.gov/fdsys/pkg/FR-2015-12-16/pdf/2015-31323.pdf.

- The ability to dynamically update the program more swiftly as new safety technologies emerge.

NHTSA intends to analyze public comments and issue a final decision notice on the planned changes by the end of 2016. Consumers are expected to begin seeing ratings under the new system by Model Year 2019 vehicles. The agency intends to launch an intense consumer awareness effort to help vehicle shoppers understand how the new ratings can guide their new-car buying decisions, as well as briefings for industry and safety stakeholders. To see NHTSA's "5-Star Safety Ratings for the Future" fact sheet and video visit http://www.safercar.gov/5Stars.

On March 12, 2016 NHTSA announced its first-ever, national advertising campaign aimed at parents of children ages 8-14 to make sure their kids are consistently and properly wearing their seat belt every time the car is moving. The campaign, developed in both English and Spanish[19], includes television, radio, outdoor, print and digital ads. The new PSAs, produced in partnership with the Ad Council and created *pro bono* by McCann Worldgroup, Casanova Pendrill (*pro bono*) and Mister Face, will be distributed to nearly 33,000 media outlets nationwide and will run entirely in donated air and space. Visit www.safercar.gov/kidsbuckleup and www.safercar.gov/chicosabrochense for further information.

 A recent series of NHTSA focus groups found seat belt use can fall by the wayside when shuttling kids to and from school and activities, when running short errands, or when parents are a bit worn down by the daily grind, which makes this campaign urgently important. Seat belts save lives and NHTSA data show that as children get older they are less likely to buckle up. Over the past 5 years, 1,552 kids between the ages of 8 and 14 died in car, SUV and van crashes – of those who died, almost half were unbelted. The percentage of child passengers who die while riding unrestrained generally increases with age and is most pronounced among 13- and 14-year-olds regardless of seating position.

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[19] To view the campaign materials please visit http://www.safercar.gov/parents/SeatBelts/Toolkit.htm, or http://www.safercar.gov/parents/SeatBelts/chicosabrochense/Toolkit-spn.htm for the Spanish version.

5. Disconnect from Deadly Distractions[20]

What is the issue?

Quite simply, drivers, pilots, and other vehicle operators do not always have their minds on the road, waterway, sky, or track. But focusing on any other task other than what's up ahead impairs performance and can lead to deadly consequences.

It is not only portable electronic devices (PEDs) that can distract us during vehicle operations, although PEDs have magnified the dangers of distraction in recent years.

Since 2003, the NTSB has found PED distraction as a cause or contributing factor in 11 accidents that killed 50 people and injured 259. And the NTSB does not even investigate the majority of highway crashes.

According to the National Highway Traffic Safety Administration (NHTSA), 3,179 people died in 2014 in vehicle accidents where the driver was distracted. Many of those victims were the drivers themselves. NHTSA reports that drivers engaging in visual-manual tasks, such as dialing or texting, triple their risk of a crash.

In 2013, the AAA Foundation for Traffic Safety reported that more than two out of three drivers indicated that they talked on a cell phone while driving within the past 30 days. More than one of three drivers admitted to reading a text message or e-mail while driving, and more than one of four drivers admitted to typing or sending a text or e-mail.

A 2015 report from State Farm revealed a new staggering trend: nearly 30 percent of drivers surveyed admitted to accessing the Internet while driving. That compares to just 13 percent who admitted to surfing the Web while driving in 2009.

In more heavily regulated transportation industries like aviation, marine and rail, communicating with crew and dispatchers, checking instruments and equipment, and handling scheduled procedures may be part of their work duties. But, like in private motor vehicles, engaging in tasks that don't support the driving or operating task can have deadly consequences.

What can be done?

Since people have limited attention, each auxiliary task impairs our processing of the primary task. For safety-critical operations, distraction must be managed, even engineered, to ensure safe operations.

It will take a cultural change for drivers to understand that their safety depends on disconnecting from deadly distractions. In regulated transportation, the strict rules that already minimize the

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[20] http://www.ntsb.gov/safety/mwl/Pages/mwl5-2016.aspx

threat of distraction on paper must be embraced by every operator on every trip, and where we learn that distraction can be eliminated, reduced, or mitigated, regulators should act to do so.

The first step toward removing deadly distractions will be to disconnect from non-mission-critical information. For decades, aviation has recognized the need for "sterile cockpit" procedures that restrict activities and conversations to the task at hand. But all modes of transportation need to rise to today's distraction challenges. That's why, in December 2012, we called for a driver ban for all PEDs. We have issued similar recommendations for aviation, marine, and rail.

The public agrees. In June 2014, the National Safety Council reported that 73 percent of drivers think that more enforcement of texting laws is needed. And the AAA Foundation for Traffic Safety reported that 85 percent of Americans think that other drivers who talk on cell phones are a threat to safety.

But currently only 14 states and the District of Columbia ban the use of hand-held cell phones while driving. The District of Columbia and 37 states restrict the use of cell phones by novice drivers, and 44 states and the District of Columbia ban text messaging while driving. None ban the use of hands-free devices.

Public education continues to be important for reaching drivers, operators, and safety-critical personnel about the dangers of distractions.

Likewise, we need to continue to build our technical understanding of distraction arising from auxiliary tasks in regulated transportation, especially as regards new vehicle technologies that require real-time operator attention. Advances in these areas will support regulatory efforts and lead us toward a cultural norm that encourages and supports operators to remain disconnected from deadly distractions.

DOT Response:

The rise of portable electronic devices usage amongst the public and transportation employees has made distractions more prevalent and a heightened safety risk during the operation of vehicles, trains, and planes. The Department continues to better understand and mitigate the safety risks associated with distractions through research, education and outreach, and enforcement. FAA in a publication on the use of electronic devices on the flight deck provided information related to PED prohibition for flight crew members, and encouraged the aviation industry to expand procedure manuals and training programs to include other industry employees in the prohibition of PEDs. FMCSA held Operation Safe Driver Week in October of 2015 with stakeholders to advocate against distracted driving, and completed two research projects related to secondary task activity distractions and measuring the impact of distracted driving on CMV operators. FRA is working with research partners, rail labor, and rail companies on regulatory, voluntary, and research efforts to reduce PED distractions. FRA is near completion on a research

project on mitigating distraction through sustained attention training, developed outreach materials, and is working on an NPRM requiring inward- and outward-facing image recording devices that could capture non-compliance with prohibitions on the use of PEDs while operating trains. FTA developed an E-Learning course on "Curbing Transit Employee Distracted Driving. NHTSA continues research efforts related to distracted driving data and appropriate driver distraction guidelines, and recently completed a distracted driving High Visibility Enforcement demonstration project in 2015.

Federal Aviation Administration:

The flight crew is strictly prohibited from engaging in specific distracting activities. In 1981, the FAA introduced the "Sterile Cockpit Rule" (§ 121.542) that prohibits distracting personal activities during critical phases of flight, which includes all ground operations involving taxi, take off, and landing, and flight operations below 10,000 feet, except cruise.

The FAA began to specifically prohibit personal use of electronic devices on the flight deck, effective April 14, 2014, for Part 121 air carriers. Section 121.542 (as amended) provides the framework to ensure that certain non-essential activities do not contribute to the challenge of task management on the flight deck or a loss of situational awareness due to attention to non-essential tasks. The use of personal wireless communication devices or laptop computers for personal use while at a duty station on the flight deck while the aircraft is being operated is strictly prohibited.

To complement § 121.542, the FAA issued InFO 14006, Prohibition on Personal Use of Electronic Devices on the Flight Deck, on May 20, 2014. InFO 14006 provides information not only to part 121 air carriers regarding the prohibition on personal use of electronic devices on the flight deck, but also encourages directors of safety and training managers for all operators under parts 135, 125, and 91K to include operating procedures in their manuals and crewmember training programs prohibiting flight crew members from using such devices for personal use during aircraft operation.

Federal Motor Carrier Safety Administration:

During Operation Safe Driver Week, held October 18-24, 2015, FMCSA, the Commercial Vehicle Safety Alliance, and many other stakeholders called on all drivers to reduce aggressive and distracted driving and save lives. Data were collected by 2,789 law enforcement officials at 706 locations across the United States and Canada. There were also numerous outreach events throughout the week at high schools, State capitals, State fairs, truck rodeos, sporting events and other locations. Last year during Operation Safe Driver Week, 21,012 CMV traffic enforcement contacts were made, compared to 19,980 in 2014; roadside inspections totaled 19,480 in 2015, compared to 24,184 in 2014. Operation Safe Driver continues to target problem behaviors by all drivers.

In addition to the Operation Safe Driver activities, FMCSA completed two research projects to

further understand and help reduce driver distraction in commercial vehicle operations.

The first research project, ***Driver Distraction: Eye Glance Analysis and Conversation Workload*** (FMCSA-RRR-14-001), is available on DOT's Web site at http://ntl.bts.gov/lib/56000/56200/56289/14-001-Cognitive_Distraction-FINAL-NOV_2015.pdf. The objective of this study was to better understand the risk associated with secondary task activity (with a specific focus on voice-related secondary tasks) while driving a truck or bus under real-world driving conditions and pressure.

The research team analyzed naturalistic data from commercial trucks and buses (weighing greater than 10,000 lbs.) during a four-month period. Unfortunately, the small sample size of specific secondary tasks prohibited an analysis of the data. To increase statistical power, the analysis focused on secondary task categories, such as visual, visual/manual (VM), talk/listen on an electronic device, and talk to passengers. The results were consistent regardless of the approach used. For example, the secondary task category of talk/listen on an electronic device was consistently found to have no significant impact on the risk of involvement in a safety-critical event compared to spurious baselines and random baselines. This result is consistent with other naturalistic truck driving research which found that talking/listening on a handheld device did not increase the risk of involvement in a safety-critical event, and talking on a hands-free phone or citizens band (CB) radio decreased the risk of involvement in a safety-critical event. In this study, visual and VM secondary task categories were consistently found to have no impact on the risk of involvement in a safety-critical event compared to spurious and random baselines. However, given the small sample size and grouping into secondary task categories, it is premature to indicate that visual or VM secondary tasks are safe to perform while driving a truck or bus.

The second research project, ***Using Driver Simulations to Measure the Impact of Distracted Driving on Commercial Motor Vehicle Operators*** (FMCSA-RRR-13-048), is available on DOT's Web site at http://ntl.bts.gov/lib/55000/55100/55167/13-048_Distracted_Driving_-_FINAL_-_June_2015.pdf. The objective of this study was to address the identified gaps in the literature by conducting applied research to better quantify the dangers of distracted driving. Using state-of-the art driving simulators in realistic traffic, this project focused on commercial driver's license operator performance while experiencing distractions in several driving scenarios combined with various attention-stealing distractions. A research design was created to account for real-world phenomena and used touchscreen devices, cell phones, and external distractions while CMV drivers drove a motion-based truck-driving simulator.

The results of this investigation show that the use of a cell phone, the use of a touchscreen mp3 player, the presence of external distraction(s), or any combination of the three causes deficits in driving performance. Overall, both performance and physiological measures showed evidence

of driver distraction. Performance measures suggested that the largest performance deficiencies come from actively using a touchscreen mp3 player. Electroencephalogram (EEG) measures showed that while both mp3 player and cell phone use increased workload and decreased attention, the cell phone was the highest distracting factor. Comparing the effect of the distracting scenario to the non-distracted scenario, the team found that manipulating a touchscreen mp3 player device is approximately three times more distracting among professional drivers. In addition, the team found that being engaged with multiple tasks while driving is approximately two to three times more distracting than non-distracted driving among professional drivers.

The two research projects built upon previous studies used to promulgate FMCSA's current regulatory requirements. In December, 2010 FMCSA proposed restricting only hand-held mobile telephone use by CMV drivers based on the Olson, et al. (2009) and Hickman, et al. (2010) studies found that "talking or listening to a hands-free phone" and "talking or listening to a hand-held phone" were relatively low-risk activities and included only brief periods when the drivers' eyes were off the forward roadway. Studies have not determined definitively that talking on a mobile telephone while driving presents a significant risk. The Hickman study shows that reaching for or dialing a cell phone while driving increased the odds of involvement in a safety-critical event. However, the study also shows that the act of talking or listening on a hands-free cell phone while driving decreased the odds of involvement in a safety-critical event.

Based on these studies, FMCSA determined that it is the action of taking one's eyes off the forward roadway to reach for and dial the mobile telephone that constitutes the high-risk activity. FMCSA's final rule published on December 2, 2011, restricted only hand-held mobile telephone use by CMV drivers while operating in interstate commerce. More recent studies vary with respect to the overall safety-related risk of talking on a cell phone while driving. FMCSA agrees that cognitive distraction is a safety risk; however, the Agency is not aware of data sufficiently precise to support a rulemaking action. FMCSA believes the actions taken in its 2011 final rule to restrict the use of hand-held mobile telephones by CMV drivers was sufficient to address the highest safety risk. FMCSA plans no further regulatory action to amend 49 CFR 392.82, which prohibits the use of a hands-free portable electronic device by a commercial driver's license holder while the driver is operating a CMV.

The FMCSA will continue to enforce its regulations, provide tools to enhance safe driving practices, and build upon its programs and the national momentum DOT has spearheaded for the last several years to curb these dangerous behaviors. More information on FMCSA and distracted driving can be found on FMCSA's Web site at http://www.fmcsa.dot.gov/rules-regulations/topics/distracted-driving/overview.aspx.

Federal Railroad Administration:

FRA is working with its research partners, rail labor, and rail management on regulatory, voluntary, and research efforts to reduce personal electronic device (PED) distractions for safety critical rail employees. For example, FRA worked with the Department's Volpe National Transportation Center (Volpe) to conduct an electronic device distraction focus group for railroaders. This focus group effort extended existing research and provided a current baseline for electronic device usage in the rail industry[21].

FRA established the Railroad Safety Advisory Committee (RSAC) working group on electronic device distraction, which recommended voluntary pilot programs for making use of distracting electronic devices socially unacceptable. To promote such programs, FRA awarded a grant for a peer-to-peer coaching program between 2012 and 2015. The railroad grantee continues to train its employees on coaching coworkers about the dangers of electronic device distraction. FRA developed a guide for railroads to develop similar programs. The working group also recommended that stakeholders develop outreach materials and programs. FRA developed such materials and in October 2012, then Federal Railroad Administrator Joseph Szabo recorded a message to railroad employees (http://www.youtube.com/watch?v=tW3p53Tbklc). Electronic device distraction outreach programs will need to be refreshed on a frequent basis.

In addition, FRA is in the final editing and publication process for its research report on mitigating distraction through sustained attention training. This research was conducted with the Volpe Center and FRA's Cab Technology Integration Lab simulator. As a result of this research, a commuter carrier developed a distraction awareness and mitigation training course that teaches locomotive crews strategies for managing distractions and the importance of sustained attention on the locomotive operating task.

FRA is also supporting a study of sociotechnical factors underlying workplace safety issues. The purpose of the study is to identify systemic factors and to provide a scientific basis for modifications that will improve performance. A passenger railroad developed this study in response to reports received through the FRA-sponsored Confidential Close Call Reporting System (C3RS) program. With FRA support, the railroad involved other passenger railroads in the study.

FRA has been working on an NPRM that would require inward- and outward-facing image recording devices, and the FAST Act now mandates that requirement for passenger railroads. The proposals in the NPRM would provide railroads with an effective method of determining employee compliance with prohibitions on the use of distracting electronic devices while operating trains and will act as a deterrent to prevent such violations from occurring.

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[21] "Safety Recommendation R-05-9 is classified "Closed—Acceptable Action." http://www.ntsb.gov/safety/safety-recs/_layouts/ntsb.recsearch/Recommendation.aspx?Rec=R-05-009.

Federal Transit Administration:

FTA funded and developed an E-Learning course entitled, *Curbing Transit Employee Distracted Driving*.[22] The course is designed to raise awareness of distracted driving with the purpose of reducing the risk of distracted driving by public transportation professionals. To date, 9,794 transit employees have completed the course. Elements of the course include: definition of the term "distracted," risks of driving while distracted, typical distractions, prevention tips, applicable regulations, laws, and company policies pertaining to the use of wireless devices.

National Highway Traffic Safety Administration:

NHTSA continued its research efforts in the area of driver distraction on several fronts in 2015. Four updates to distracted driving data were published in 2015 by the National Center for Statistics and Analysis. In addition, NHTSA research efforts continued the development of the Phase 2 Driver Distraction Guidelines that address portable and aftermarket devices. Research supporting the development of the Phase 3 Guidelines, which address voice-based driver-vehicle interfaces, also continued in 2015. The Agency also began three initiatives in 2015 to develop a training course for law enforcement, a monograph for prosecutors on investigating and prosecuting distracted driving cases, and a Lessons Learned Guide summarizing the highlights of the recently completed distracted driving High Visibility Enforcement demonstration projects. NHTSA published the report, Distraction by Cell Phones and Texting[23] in 2015.

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[22] Curbing Transit Employee Distracted Driving Federal Transit Administration
http://www.fta.dot.gov/newsroom/12910_14467.html 3/22/12 .
[23] Distraction by Cell Phones and Texting. National Highway Traffic Safety Administration
http://www.distraction.gov/downloads/pdfs/Distraction-Cell-Phones-Texting.pdf. 2015 .

6. Prevent Loss of Control in Flight in General Aviation[24]

What is the issue?

While airline accidents have become relatively rare in the United States, pilots and passengers involved in general aviation (GA) operations still die at alarming rates every year due to loss of aircraft control by the pilot.

Between 2008 and 2014, about 47 percent of fatal fixed-wing GA accidents in the United States involved pilots losing control of their aircraft in flight, resulting in 1,210 fatalities.

GA pilot proficiency requirements are much less rigorous than those of airline pilots. GA pilots are much more likely to have longer intervals between training sessions and longer intervals between flights.

They typically only need to complete a flight review, consisting of one hour of ground training and one hour of flight training, every 24 months. They almost exclusively maintain and improve skills on their own, and their conduct of safe flight depends more on individual abilities and judgment, potentially leaving them unprepared for situations that can lead to loss of control.

Statistically, approach to landing, maneuvering, and initial climb are the deadliest phases of flight for loss-of-control accidents. For example, on August 9, 2013, in East Haven, Connecticut, while attempting a tight circling approach in and out of clouds during gusty wind conditions, a Rockwell International 690B entered an inadvertent aerodynamic stall/spin and crashed into a house, killing the pilot, his passenger, and two children in the house.

What can be done?

In October 2015, the NTSB held a forum on "Humans and Hardware: Preventing General Aviation Inflight Loss of Control." The forum addressed some of the common causes of loss-of-control events, such as pilot inattention due to workload, distractions or complacency, and a lack of understanding how a stall actually relates to exceeding a wing's critical angle of attack (AOA), as opposed to the more common idea that it's just related to airspeed. Also noteworthy is that when airplanes are close to the ground, such as in a landing pattern, there is limited time and altitude available to recover from a stall, thus making these stalls particularly deadly.

The 2015 forum provided potential hardware solutions, such as the use of AOA indicators, and human solutions, such as increased pilot training to ensure a full understanding of stall phenomena. This training should also include understanding AOA concepts and how elements such as weight, center of gravity, turbulence, maneuvering loads, and other factors can affect an airplane's stall characteristics.

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[24] http://www.ntsb.gov/safety/mwl/Pages/mwl6-2016.aspx

Pilots should:

- *Be prepared to recognize stall characteristics and warning signs, and be able to apply appropriate recovery techniques before stall onset.*
- *Be honest with themselves about their knowledge level of stalls, and their ability to recognize and handle them.*
- *Use effective aeronautical decision-making techniques and flight risk assessment tools during both preflight planning and inflight operations.*
- *Manage distractions so that they do not interfere with situational awareness.*
- *Understand, properly train, and maintain currency in the equipment and airplanes they operate.*
- *Take advantage of available commercial trainer, type club, and transition training opportunities.*
- *Realize stall characteristics can vary with aircraft loading and are usually worse at aft CG (center of gravity).*

Airplane owners should consider installing an AOA indicator, which, coupled with pilot understanding and training on how best to use it, can enhance situational awareness during critical or high-workload phases of flight.

The Federal Aviation Administration, aviation advocacy groups, type clubs, and manufacturers, including kit manufacturers, are creating and maintaining educational initiatives that include general principles, best practices, and operational specifics as they relate to loss of control. These resources can be helpful in learning effectiveness countermeasures.

All stakeholders should recognize the importance of their roles in the reduction of loss-of-control accidents. However, individual pilots play the most critical role; they have both the ultimate responsibility and the ultimate opportunity to reduce these needless accidents through ongoing education, flight currency, self-assessment, use of available technologies, and vigilant situational awareness in the cockpit.

DOT Response:

The FAA is involved in a number of activities that will continue to reduce general aviation accidents related to the loss of aircraft control. Through the General Aviation Joint Steering Committee (GAJSC), which is comprised of government and industry safety experts, safety enhancements that prevent loss of control are identified, pursued, and implemented. The agency plans on continuing its work to update 49 CFR Part 23 (Part 23) to create airworthiness standards that minimize loss of control situations. To improve pilot knowledge of this important issue outreach and guidance efforts such as the Fly Safe national safety campaign are carried out. The FAA is also spearheading outreach efforts to raise awareness about risks inherent in certain weather conditions through initiatives such as *Got Weather?*

Federal Aviation Administration:

For over 100 years, nearly half of the existence of America itself, general aviation (GA) has enabled command of the open-sky for countless pilots. It is through the spirit of this inclusive club, that the collective American GA community has grown to be the largest and most diverse in the world, with more than 220,000 aircraft, including amateur-built aircraft, rotorcraft, balloons, and highly sophisticated turbojets. However, this growth has not come without costs.

Reducing GA fatalities by 10 percent over a 10-year period (2009-2018) continues to be a top priority of the FAA. Our annual fatal accident rate continues to trend down, with the FAA meeting its FY 2014 not to exceed target of 238. A longer perspective of our performance shows that since FY 1989, we have reduced GA fatal accidents by over half (from 480 to 238). We all agree that this number is still too high. The FAA continues to reduce GA accidents by using a primarily non-regulatory, proactive, and data-driven strategy to get results, which is similar to the strategy the FAA uses in commercial aviation.

Loss of control (LOC) — mainly aerodynamic stalls — accounts for the largest number of GA fatal accidents. On average, there is one fatal accident involving LOC every four days. A LOC accident involves an unintended departure of an aircraft from controlled flight. LOC can happen because the aircraft enters a flight regime that is outside its normal flight envelope and may quickly develop into a stall or spin. It can introduce an element of surprise for the pilot. LOC happens in all phases of flight. It can happen anywhere and at any time.

General Aviation Joint Steering Committee

The FAA fully supports the work of the General Aviation Joint Steering Committee (GAJSC). Comprised of both government and industry safety experts, the GAJSC is an effective partnership that adopted the goal of a continuous reduction in the risk of fatal GA accidents. It approaches this goal through a Commercial Aviation Safety Team (CAST)-like process of a data-driven, consensus-based approach to analyze safety data to develop specific interventions that will mitigate the root causes of accidents.

The GAJSC continues to focus on the leading categories of accidents, identifying accident precursors and addressing them with an optimal and effective package of actions. Because the GAJSC membership represents pilots, operators, aircraft manufacturers, training and academia, as well as others, the scope of operations included in the work of the GAJSC is very broad. The diversity of the GA fleet and operations requires greater emphasis on acquiring, sharing, and analyzing aviation safety data in a collaborative environment. This becomes especially important as historical accident causes are studied and mitigated. To accomplish this, the GAJSC also developed an incident-based risk reduction methodology that uses precursors to focus on risk prediction by identifying anomalies and trends. First adopted in GA by the

corporate and business communities, these types of risk mitigation strategies can generate corrective actions before accidents occur.

Based on almost a decade of trust and confidence, the Aviation Safety Information Analysis and Sharing (ASIAS) program allows industry and government members to share sensitive safety information in a protected environment. Digital and text-mining tools have been developed that enable a fusion of flightcrew safety reports, aircraft digital flight data recorder parameters, high definition terrain databases, weather data, and radar track data. The final product generates awareness and causal understanding of emerging safety threats never before possible, including risks that could be LOC precursors. On March 31, 2014, the FAA announced the start of a one-year project to illustrate the value, capabilities, and benefits of the ASIAS program for the GA community. The project explored potential new information sources such as GA Flight Data Monitoring (FDM), voluntary safety reports, manufacturer reports, and information collected from avionics using new common technologies such as mobile device platforms, including iOS and Android. The project report was finalized and will soon be available on www.gajsc.org.

The Safety Analysis Team, a team that guides the daily work of the GAJSC and monitors implementation and effectiveness of the developed mitigations, found that LOC–Inflight (LOC-I) was by far the leading cause of death in GA accidents. To mitigate the risks of LOC–I accidents, the GAJSC chartered two LOC working groups to look at LOC-I during: (1) approach and landing, and (2) all other phases of flight. From the distillation of lessons learned, the committee devised critical safety enhancements (SEs) that greatly reduce accident risk and ultimately save lives. The GAJSC follows a disciplined, proactive, data-driven approach to develop SEs. To date the GAJSC has completed 19 of the 38 SEs developed thus far and most are directed toward mitigating LOC accidents. The SEs cover a variety of solutions involving training, best practices, risk based flight reviews, proactive programs such as FDM, aeromedicine and technology just to name a few. Additional information about these working groups and associated SEs is available at: www.gajsc.org/loss-of-control-working-group.

An example of a GAJSC LOC SE is its findings on angle of attack (AOA) indicators. The combined results from the accident studies found that a properly installed and used AOA indicator would be one of the strongest mitigations against LOC–I accidents. Following the LOC–I working group studies, a commitment by GAJSC members resulted in the launch of the voluntary incorporation of AOA technology on GA aircraft by pilots and aircraft owners. Driven by an external vane or derived information from an avionics unit, AOA indicators help to prevent pilots from inadvertently entering into a stall and give pilots awareness of their AOA during all phases of flight. Proactive SEs like this one allow pilots to detect and correct problems before an accident occurs (as discussed below, the FAA is simplifying AOA requirements, which is helping to reduce their cost and increase their use). Effective mitigations like installation of AOA indicators can fully eliminate major accident categories.

Through the GAJSC, the FAA has also worked with industry to develop its new Airmen Certification Standards (ACS). Designed as a replacement for the FAA's aging practical test standards, the ACS focuses not only on stick and rudder skills, but also on the risk management and aeronautical decision-making elements that figure so prominently in LOC accidents.

Aircraft Design

The FAA continues to work on a new performance-based regulatory approach to airworthiness standards for Part 23 airplanes. These airplanes range from small piston-powered airplanes to complex high-performance executive jets. Accident studies continue to show that stall/departure related accidents occur below an altitude where the airplane could recover from a spin, even if the pilot reacted perfectly to the situation. Under the Part 23 rewrite rulemaking project, we plan to:

1) Reorganize Part 23 into performance-based requirements by removing the detailed design requirements from it. The detailed design provisions that would assist applicants in complying with the new performance-based requirements would be identified in means of compliance documents to support this effort;
2) Promote the adoption of the newly created performance-based airworthiness design standard as an internationally accepted standard by the majority of other civil aviation authorities;
3) Re-align the Part 23 requirements to promote the development of entry-level airplanes similar to those certified under Certification Specification for Very Light Aircraft;
4) Enhance the FAA's ability to address new technology;
5) Increase the GA level of safety provided by new and modified airplanes;
6) Amend the stall, stall warning, and spin requirements to reduce fatal accidents and increase crashworthiness by allowing new methods for occupant protection; and
7) Address icing conditions that are currently not included in Part 23 regulations.

The FAA is also working with manufacturers to build stall resistance into aircraft designs through the use of improved aerodynamics, limited pitch control capability, and AOA indicators to better inform the pilot. This work has contributed to the production of autopilots that provide automatic limiting to help prevent LOC incidents and accidents. In coordination with the National Aeronautics and Space Administration (NASA), the FAA conducted research and published results with academia and industry on design assurances and new methods for certifying autopilots, novel displays that enhance pilot situational awareness, and conducted a workshop with these partners to develop a roadmap for certifying technologies to prevent LOC-I. Research continues in these areas.

On February 5, 2014, the FAA took an important step to help improve safety in small aircraft by simplifying design and production approval requirements for an AOA indicator. AOA indicators

provide the pilot with a visual aid to prevent LOC of the aircraft in the critical phases of flight. Previously, cost and complexity of indicators limited their use to the military and commercial aircraft. Under new FAA guidelines, AOA devices can be added to small airplanes to supplement airspeed indicators and stall warning systems, giving pilots an additional tool to avoid a dangerous aerodynamic stall and subsequent loss of control. The FAA is updating a recently released AOA policy based on research with NASA, academia, and industry, and developing certification criteria for derived AOA systems using the existing attitude heading reference system.

The FAA continues to develop new training materials to help pilots avoid LOC accidents. Most recently, in November 2015, the FAA published an article focusing on Vmc (minimum airspeed a twin engine aircraft is controllable with only one engine operational) training and AOA indicators. Available on-line, this training stresses the importance of being prepared for engine failures by training using comprehensive Vmc practice demonstrations supervised by a certificated flight instructor. This article also emphasizes the value of equipping one's aircraft with an AOA system to avoid stall/spin accidents. In addition, the FAA recently posted an AOA awareness video on its FAA TV Web site (www.faa.gov/tv/?mediaid=1172). This valuable video presents an analysis of AOA devices in the GA environment, and promotes FAA policy concerning non-required/supplemental AOA based systems for GA airplanes.

On June 5, 2015, the FAA established a new policy effectively allowing vacuum-driven attitude indicators in small aircraft to be replaced with electronically-driven attitude indicators without the need of a standby attitude instrument. Older vacuum-driven attitude indicators are less reliable, often unavailable, and more expensive to maintain than electronically-driven indicators.

Amateur-Built

Amateur-Built and other experimental aircraft were involved in more than 25 percent of U.S. fatal GA accidents over the past five years and account for an estimated five percent of total GA fleet hours. With the help of outreach and updated safety materials developed by the FAA and GAJSC industry participants, this segment of the GA industry showed a significant decline in fatal accidents in FY 2013. LOC remains the leading cause of fatal accidents involving amateur-built aircraft. The FAA recently updated the Airmen Transition to Experimental or Unfamiliar Airplanes Advisory Circular (AC) 90-109A, on June 29, 2015, based on recommendations from the Amateur-Built Flight Standardization Board. The AC provides guidance and training experience recommendations to owners, pilots, and flight instructors who fly experimental airplanes.

The FAA also published the Additional Pilot Program (APP) for Phase 1 Flight Test AC 90-116, on September 23, 2014, to provide information and guidance on the APP for flight testing experimental aircraft. The APP was developed to improve safety by enhancing builder/owner pilot skills and mitigate risks associated with phase 1 flight testing of aircraft built from

commercially-produced kits through the use of a qualified additional pilot. The APP is optional and will provide another pathway to phase 1 flight testing.

Weather

The FAA is spearheading an outreach effort to raise awareness about risks inherent in certain weather conditions. The plan includes leveraging weather data collected by the NTSB, as well as data collected from the GAJSC dashboard, showing how many GA pilots encounter level 5 (extreme) weather. The first phase will be delivered at the National Air Traffic Controllers Association Communicating for Safety Conference in March 2016. This will be an orchestrated effort across multiple organizations to help provide a solution to high visibility weather concerns regarding GA and air traffic control services.

Got Weather? Most weather-related accidents are fatal, and a failure to recognize deteriorating weather continues to be a frequent case or contributing factor of accidents. While the GAJSC has produced several SEs related to weather as part of their work on LOC-I, the FAA and industry partners launched an eight-month national safety campaign in May 2014, titled "Got Weather?" to help GA pilots prepare for potential weather challenges. The campaign featured a monthly weather topic such as turbulence, thunderstorms, icing, crosswinds, and the resources available to pilots. Pilots were able to go to one user-friendly Web site to get fast facts about the topic and links to partner videos, safety seminars, quizzes, proficiency programs, online training, case studies, and more. We also distribute information and host seminars at major GA events, including Oshkosh, Sun 'n Fun, and the Great Alaska Aviation Gathering. The campaign reached approximately 4.5 million people. Additional information about this campaign is available at: www.faa.gov/about/initiatives/got_weather/.

More than three-quarters of Alaskan communities have no access to highways or roads and depend on aviation for access to food, mail, jobs, schools, medical services, and travel. For these communities, aircraft are essential to everyday life. The FAA finished installing 221 weather cameras in Alaska to provide pilots with real-time, visual weather information to help pilots determine when and where it's safe to fly. The program includes a recently updated Web site that enhances the navigational planning on an interactive map with easily accessible images and other weather data products. The pictures from this network of cameras are critical in helping pilots operating in Alaska to make better safety decisions. The program results in the added benefit of saving fuel by greatly reducing situations where pilots take off and have to return due to bad weather.

Other enhancements to weather diagnosis and forecast products include:

- On October 20, 2015, the Graphical Turbulence Guidance version 3.0 added low level (below 10,000 feet) and mountain wave turbulence to the existing capability of clear air turbulence, and extended the forecast time from 12 to 18 hours, which is available at: http://aviationweather.gov/turbulence/gtg.

- The Icing Product for Alaska- Forecast (IPA-F) is a gridded product depicting icing probability, severity, and super-cooled large droplets potential specifically for the Alaska region. IPA-F quality assessment activities will be completed in the summer of 2016 and will then be transitioned to the National Weather Service (NWS) for experimental running and future implementation.
- Ceiling and Visibility (C&V) Analysis-Alaska (CVA-AK) is a rapidly-updated display of C&V conditions across Alaska at or near instrumented and non-instrumented airfields and along data-sparse routes between airfields including treacherous and heavily-traveled mountain passes. CVA-AK exploits data fusion techniques using surface weather observations, numerical weather prediction models, and data derived from satellites and Alaskan weather cameras. An initial experimental product for further research and development is expected in 2017.
- Helicopter Emergency Medical Services (HEMS) provide transportation of critically ill and injured patients. Because of the time-critical nature of their mission and the often remote accident scene destination without weather reporting services, HEMS operators are especially vulnerable to weather hazards. The HEMS tool, rather than a weather product, is an interactive display that aggregates a number of existing weather products into a single, quick-glance, automated display. The 2015 transition to operations at the NWS's Aviation Weather Center, moved the tool to the www.aviationweather.gov Web site, brought improvements in product monitoring and availability, and added more core functionality and support for mobile devices. Future HEMS enhancements will improve the analyses and forecasts of instrument meteorological conditions (IMC).
- The Weather Technology in the Cockpit (WTIC) program is focused on GA preparedness and awareness to aid in decision making prior to a weather-related LOC event. The WTIC program has:
  o A goal to define the minimum weather required in the GA cockpit for a pilot to safely conduct a flight and make the pilot a more informed decision maker;
  o Addressed gaps in the pilot written examination as it relates to weather knowledge. The output from this research was one hundred weather-knowledge questions that will be added to the knowledge data bank for inclusion in the private pilot written examination;
  o Addressed causal factors that are associated with the high rate of GA weather related accidents where pilots carelessly or inadvertently flew from visual flight rules (VFR) into IMC conditions resulting in pilot disorientation and LOC of their aircraft; and
  o Funded research on the feasibility of providing advance notification to the pilot of adverse weather along their intended flight path or destination. The intent is to afford the GA pilot the opportunity to make an earlier and more informed weather-related decision prior to entering adverse conditions.

Outreach and Guidance

- The FAA and GA groups launched the "Fly Safe" national safety campaign to educate the GA community on how to prevent LOC accidents during the flying season. FAA Deputy Administrator Mike Whitaker officially kicked-off the campaign on June 6, 2015, at the Aircraft Owners and Pilots Association's Fly-In at the Frederick Municipal Airport, Frederick, MD. Users can join the campaign by using the hashtag #FlySafe and follow it on Facebook, Twitter, YouTube, and Instagram.
- Published six times a year, the FAA Safety Briefing (formerly FAA Aviation News) promotes aviation safety by discussing current technical, regulatory, and procedural aspects affecting the safe operation and maintenance of aircraft.
- The FAASTeam's Web site (www.faasafety.gov/) is a good resource for pilots, flight instructors, and mechanics to help improve their skills and knowledge. The site hosts the FAA Wings pilot proficiency program and contains online pilot training materials. These training materials include courses to help a pilot avoid the common pitfalls of VFR flight, such as Avoiding LOC and other courses associated with LOC.
- The FAA updated the following ACs addressing LOC:
  - AC 61-83H, Nationally Scheduled, FAA-Approved, Industry-Conducted Flight Instructor Refresher Course, was published on August 4, 2015, and now requires that LOC is taught as a core topic of instruction;
  - AC 61-98C, Currency Requirements and Guidance for the Flight Review and Instrument Proficiency Check, was published on November 20, 2015, and now includes a chapter titled "Reducing General Aviation Accidents," with a focus on LOC;
  - AC 120-109A, Stall Prevention and Recover Training, was published on November 24, 2015, and was revised to ensure correct responses to impending and full stalls; and
  - AC 120-111, Upset Recovery Training, was introduced on April 14, 2015, and provides recommended practices and guidance for academic and flight simulator training device training for pilots to prevent developing upset conditions and ensure correct recovery responses to upsets.

7. Promote Completion of Rail Safety Initiatives[25]

<u>What is the issue?</u>

Even on our best days, human beings can make mistakes.

Positive Train Control (PTC) prevents mistakes from turning tragic, by keeping trains from colliding or derailing even if their operators do not.

Strong rail tank car safety rules minimize the risks to people and property if a train carrying hazardous liquid such as crude oil derails or a collision occurs.

These measures save lives – but only where implemented. They should be implemented broadly and with minimal delays.

The good news is that Congress and regulators have issued federal mandates requiring PTC and improved tank car design. The bad news is that we have already seen delays in implementation by railroads, both public and private.

In the case of PTC, Congress passed a law in 2008 after a deadly PTC-preventable head-on collision between a commuter train and a freight train in Chatsworth, California, that killed 25 people and injured more than 100. The law demanded implementation by the end of 2015.

Many railroads worked hard – and spent billions of dollars – on PTC implementation, improving the safety of many tracks and trains. Despite these efforts, however, it became clear as the implementation deadline approached that tens of thousands of rail miles, and millions of rail passengers, would be left unprotected by PTC. Late last year, Congress acted to grant the railroads an additional three years to implement their PTC systems, until 2018.

Since 2008, the NTSB has investigated a long list of railroad accidents that would have been prevented by PTC, including the May 12, 2015, Amtrak derailment in Philadelphia, Pennsylvania, that killed eight and injured more than 200, and the December 1, 2013, Metro-North passenger train derailment in the Bronx, New York, that killed four and injured 61.

PTC uses GPS to prevent train-to-train collisions, overspeed derailments, and the unauthorized movement of trains into work zones. The NTSB has called for a system like this for more than 45 years, yet it still has not been fully implemented in our commuter, intercity, and freight railroads.

In recent years, we have seen enormous growth in railroad shipments of crude oil and other hazardous materials through our communities. Industry has increasingly relied on "pipelines on rails"—unit trains of hazardous liquids—as a means of transportation.

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[25] http://www.ntsb.gov/safety/mwl/Pages/mwl7-2016.aspx

But accident investigations have shown that present rail tank cars are not up to the task. On July 6, 2013, for example, a 4,700-foot-long train that contained 72 DOT-111 tank cars loaded with crude oil from the Bakken fields derailed in Lac-Mégantic, Quebec. At least 60 cars released an estimated 1.6 million gallons of crude oil, which triggered an intense fire. The fire engulfed the surrounding area and completely destroyed buildings and property. Forty-seven people died.

Ensuring the integrity of our railroad system—both passenger rail and freight rail—is critical to our everyday lives and the economy of the nation.

What can be done?

Congress' law (the Surface Transportation Extension Act of 2015) requires railroads to install PTC by 2018. The extension should allow many more railroads to comply with the law, but the NTSB encourages railroads not to wait for 2018. Implementation must be completed as soon as possible.

Furthermore, the law allows railroads to apply to the Department of Transportation (DOT) for new extensions. They should not do so.

Finally, the NTSB has recommended more frequent PTC implementation progress updates. Railroads should submit such updates to the Federal Railroad Administration (FRA), and the FRA should post them on its Web site.

Safer rail tank cars should also be introduced by industry as soon as possible. In 2015, the NTSB called for an aggressive schedule for replacing or retrofitting the current rail car fleet. The DOT issued new tank car regulations with a generous 2025 implementation deadline. It did not include a performance schedule or transparent completion reporting requirements.

Yet repeated tank car breaches during derailments demonstrate that safer tank cars are essential to the safe movement of hazardous liquids by rail. Each day that passes until our nation's present tank-car fleet is replaced or upgraded is a day lived with elevated risk.

Bottom line: We have laws and regulations to implement PTC and improve tank car design, but we must avoid delays. Safety delayed is safety denied, and any given day without these lifesaving advances might be the day of the next Philadelphia or Lac-Mégantic.

DOT Response:

We agree with the NTSB that PTC technology will prevent many crashes caused by human error, and the introduction of safer rail tank cars will minimize the risks of hazardous materials transportation to both people and property. Rail collisions, overspeed derailments, unauthorized trains movements into work zones, and the increased prevalence of crude oil and other hazardous materials by rail are significant safety issues that the Department has been addressing and will continue to address through Positive Train Control (PTC) technology and rail tank car

initiatives. FRA remains committed to using its oversight and enforcement tools, as well as providing technical and financial assistance, to ensure that railroads implement PTC. FRA will conduct reviews at least annually to ensure each railroad is complying with the implementation requirements outlined in Positive Train Control Enforcement and Implementation Act of 2015 (PTCEI Act), and will issue periodic updates on each railroad's implementation progress. To support PTC implementation FRA has provided funds through grants and loans, and will be working with FTA to issue $199 million in grants for commuter rail PTC in fiscal year 2017. PHMSA, in conjunction with FRA, issued a final rule on enhanced tank car standards for high hazard flammable trains (HHFT) in May, 2015. Since that final rule FRA and PHMSA have conducted audits to ensure compliance with the new rule. PHMSA and FRA have also undertaken further rulemaking actions to address HHFT requirements in the FAST Act. In particular, the FAST Act requires the Secretary to implement a reporting requirement to monitor industry-wide progress towards modifying tank cars used to transport flammable liquids.

Federal Railroad Administration:

Positive Train Control (PTC)

FRA's Positive Train Control (PTC) Implementation Task Force is assisting and pushing railroads to implement PTC as quickly and safely as possible. Simply put: this critical, Congressionally-mandated safety technology will prevent many accidents caused by human error and save lives. FRA began calling for PTC before Congress mandated its adoption and has worked diligently to support railroads with PTC implementation planning and execution. For more than three years, FRA sounded the alarm that most railroads were not making sufficient progress to meet the original December 31, 2015 PTC implementation deadline established by the Rail Safety Improvement Act of 2008. FRA highlighted its concerns about the challenges to PTC implementation in its 2012 and 2015 PTC Status Reports to Congress.

On October 29, 2015, President Obama signed into law the Positive Train Control Enforcement and Implementation Act of 2015 (PTCEI Act), which extended the statutory deadline for PTC implementation to at least December 31, 2018. The PTCEI Act also authorizes the Secretary of Transportation and FRA by delegation, to approve a railroad's alternative schedule and sequence for implementing certain operational, non-hardware aspects of a PTC system by up to December 31, 2020. To receive an extension beyond 2018 (but no later than December 31, 2020), a railroad must demonstrate to the satisfaction of the Secretary that it has fulfilled the statutory prerequisites established by the PTCEI Act.

FRA firmly believes that each covered railroad will and should be able to complete the safe implementation of PTC by the statutory deadline. FRA is currently reviewing each railroad's revised PTC implementation plan to verify that it contains all required information. As required by the PTCEI Act, FRA will conduct reviews at least annually to ensure that each railroad is

complying with its revised implementation plan, and FRA will publish on its Web site each railroad's annual PTC progress report. FRA also plans to issue periodic updates on each railroad's implementation progress.

Thus far, FRA has provided approximately $650 million in grant funds to support PTC implementation. This includes nearly $400 million in American Recovery and Reinvestment Act of 2009 grants through FRA's High-Speed Intercity Passenger Rail program, as well as Amtrak grants and other annual appropriations. In 2015, FRA issued a $967 million loan through the Railroad Rehabilitation and Improvement Financing Program to the New York Metropolitan Transportation Authority, the largest U.S. commuter railroad provider. In addition, FRA is working with the Federal Transit Administration (FTA) on the new $199 million PTC implementation grants authorized in the FAST Act, and overseeing the resources FRA has committed to assist commuter railroads to implement PTC.

FRA recognizes the significant safety improvement that will be achieved by implementation of PTC. FRA remains committed to providing the railroad industry guidance and technical and financial assistance and using its oversight and enforcement tools to ensure that railroads implement this life-saving technology expeditiously and safely. During the last seven years, FRA has met regularly with the railroads, hired staff to oversee PTC implementation, and worked with the Federal Communications Commission to resolve issues with spectrum acquisition and availability. FRA will continue to do so until every Class I, intercity passenger, and commuter railroad has implemented PTC fully and successfully.

Enhanced Tank Car Final Rule

FRA was actively involved in the development of the technical regulatory impact analysis for PHMSA's HM-251 rule, *Enhanced Tank Car Standards and Operational Controls for High Hazard Flammable Trains (HHFT)*,[26] issued on May 8, 2015. FRA developed an advanced model to assess risk mitigation measures related to tank car design, speed restrictions, and brake systems. Using physical and statistical principles, the model enables DOT to consider regulatory changes individually and in combination to optimize safety benefits. FRA is continuing to develop the model and expand its capabilities for future rulemakings and cost-benefit analyses.

The final rule establishes new minimum tank car design specifications and retrofit regulations that increase the safety of moving energy products by rail. Tank cars designed and retrofitted to these new regulations will provide superior product retention capability in accident scenarios through better puncture resistance, flame resistance, and valve protection. The rule also imposes a phase-out schedule for tank cars that do not meet the new standards and implements operational controls (such as speed restrictions, route analysis, and enhanced braking) to further

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[26] Federal Register, Vol.80, No. 89, Part II, pages 26644 to 26750, May 8, 2015.

reduce the likelihood and consequences of derailments involving large numbers of tank cars loaded with flammable liquids.

Oversight of the HHFT Regulatory Requirements

FRA is taking several actions to oversee implementation of and compliance with HM-251. The rule added HHFTs to the list of materials and trains for which a route risk assessment must be performed. In this regard, FRA has audited the Class I railroads to verify that they are performing risk assessments and moving HHFTs on low risk routes. To ensure that shippers of unrefined petroleum products in all modes are adhering to the new requirements, PHMSA and FRA conducted inspections that focused on shippers' compliance with written sample and testing plans for Bakken crude oil.

FRA and PHMSA are developing regulatory options that will ensure adequate distribution of crude oil route information to state, local, and other entities. On May 7, 2014, DOT issued an emergency restriction prohibition order (ERPO)[27] that required railroads to inform State emergency response commissions about Bakken crude oil unit trains moving thorough the commissions' states. HM-251 replaced the ERPO's notification requirement with an HHFT route risk analysis provision that requires communication with officials of State, tribal, local, and regional fusion centers to give first responders information about rail traffic through their jurisdictions. After issuance of the final rule, FRA and PHMSA required ongoing compliance with the ERPO requirement, while the agencies consider notification alternatives. FRA regularly audits compliance with the ERPO, including an initial audit of each Class I railroad that moves HHFTs and spot checks of selected states in each railroads' system.

During 2015, FRA and PHMSA (with Transport Canada) audited the Association of American Railroads' Tank Car Committee implementation of delegated authority to approve tank car designs for manufacture, modification, and repair to comply with the new HM-251 tank car specifications. FRA is working to finalize a final report with findings and recommendations based on the audit.

FAST Act

FRA is currently working with PHMSA to address the FAST Act requirements. The FAST Act included provisions that bolster the Department's efforts to improve the safety of rail transportation of energy products, including:

- Expanding the HM-251 tank car phase-out program to include all tank cars used to transport flammable liquids.

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[27] DOT-OST-2014-0067

- Mandating that tank cars designed to the DOT-117 design specification and cars retrofitted to the DOT-117R design specification have one-half-inch thick insulation blankets to satisfy the rule's thermal protection requirements.
- Adding a reporting requirement on industry progress toward meeting applicable deadlines for modifying rail tank cars that transport Class 3 flammable liquids and requiring summary status reports to Congress.
- Mandating further testing of HM-251's electronically controlled pneumatic (ECP) brake system requirements, and requiring the Department to update the HM-251 regulatory impact analysis and determine whether the ECP brake system requirements are justified based on the results of the additional study and testing.
- Mandating enhanced top fitting protection standards for tank cars retrofitted to meet HM-251.

Other Relevant FRA Actions

In addition to FRA's involvement in HM-251, which largely focused on mitigating the consequences of HHFT accidents and improving emergency response capabilities, FRA has undertaken other initiatives to prevent derailments or accidents, including:

- Issuing on April 17, 2015, the Wheel Inspections and Wheel Impact Load Detection Standards for HHFTs safety advisory.[28]
- Issuing on July 29, 2015, the final rule to enhance requirements for the safe securement of unattended rail equipment.[29]
- Issuing waivers for continuous rail integrity testing that enable railroads to perform detailed internal rail flaw inspections along greater lengths of track.
- Issuing on November 7, 2014, the final rule that establishes minimum standards for railroad training programs for safety related employees.[30]
- Increasing track and rail integrity oversight of crude oil unit train routes.
- Beginning rulemakings on risk reduction programs, fatigue management, and crew staffing.
- Planning for separate Railroad Safety Advisory Committee working groups to consider rail head wear regulation and to review regulations specific to handling of hazardous materials transportation by rail.

Federal Transit Administration:

Positive Train Control

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[28] SA 2015-01.
[29] Federal Register, Vol.80, No. 151, Part XIV, pages 47350 to 47386, August 6, 2015.
[30] Federal Register, Vol. 79, No. 216, Part II, pages 66460 to 66510, November 7, 2014.

To reiterate, Section 3028 of the FAST Act authorizes grants for positive train control. The discretionary program authorizes funding for FY 2017, and funds will be used for the installation of positive train control systems as required under 49 U.S.C. § 20157, which states that Class I railroad carriers and each entity providing regularly scheduled intercity or commuter rail passenger transportation shall submit to the Secretary of Transportation a revised plan for implementing a positive train control system by December 31, 2018. The Federal Railroad Administration (FRA) will issue the Notice of Funding Availability and select the recipients of the positive train control grants. FTA will administer the grants once the allocations to recipients are announced.

Office of the Secretary of Transportation:

The FAST Act in Section 7308 requires the Secretary to implement a reporting requirement to monitor industry-wide progress toward modifying rail tank cars used to transport Class 3 flammable liquids. Collecting and publishing summary data tank cars will help promote completion of rail safety initiatives. FRA, FMCSA, and OST-R will be coordinating in order to address this provision.

Pipeline and Hazardous Materials Safety Administration:

Rulemakings

PHMSA initiated a rulemaking to revise the applicability of the comprehensive oil spill response plans to trains transporting petroleum crude oil. The NPRM would also include an information-sharing component on high-hazard flammable trains in accordance with the FAST Act (§ 7302). We are currently working towards publishing an NPRM.

PHMSA has also initiated three new rulemakings in response to the FAST Act that address rail safety and emergency response as follows:

- Real-time emergency response and train consist information
- Thermal blanket and top fittings protection, and a modified phase-out schedule for legacy tank cars (for transport of Class 3 flammable liquid material)
- Grants NPRM information - removing requirements stipulating that grantees provide written statements agreeing to make at least 75 percent of the Federal *planning* funds awarded available to local emergency planning committees (LEPCs) and at least 75 percent of the Federal *training* funds awarded available for the purpose of training public sector employees employed or used by political subdivisions.

Safety Initiatives

PHMSA developed the Transportation Rail Incident Preparedness and Response (TRIPR) initiatives. Resource materials were developed in collaboration with a number of Federal and industry stakeholders to provide critical information on best practices related to rail incidents involving hazard Class 3 flammable liquids, such as crude oil and ethanol. The modules were made available in May 2015 and are located on the PHMSA Web site. PHMSA's Office of Hazardous Materials Safety also developed a "Sampling and Testing Program for Unrefined Petroleum-Based Products" brochure to assist shippers.

PHMSA initiated a task group with the Federal Railroad Administration (FRA) Rail Safety Advisory Committee to address a range of topics in consideration of revisions to the rail transportation requirements of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180), to enhance rail safety.

Electronically controlled pneumatic (ECP) braking initiatives- In response to the FAST Act, requiring the Secretary of Transportation to undertake an ECP Brake Study through the National Academy of Sciences, FRA and PHMSA jointly issued a Request for Information (RFI) to the NAS the week of February 22, 2016. Initial cost estimates to perform the study (NAS, Association of American Railroads) far exceed available R&D funding at PHMSA.

PHMSA added sampling and testing initiatives that support rail safety initiatives—HM-251 requires shippers to establish and maintain a sampling and analysis plan to ensure that crude oil being offered into transportation is properly classified. PHMSA's Office of Hazardous Materials Safety developed a "Sampling and Testing Program for Unrefined Petroleum-Based Products" brochure to assist shippers.

8. End Substance Impairment in Transportation[31]

What is the issue?

For more than 30 years, we have known that drinking and driving kills. In the last 15 years alone, data show that one-third of highway deaths involved an alcohol-impaired driver.

But our new reality is this: impaired driving does not just involve alcohol. Drugs can also affect the ability to drive or operate any vehicle.

Illegal, prescription, or over-the-counter drugs can have impairing side effects. But, unlike alcohol, drugs can affect each person differently, which makes tackling drugged-impaired driving or vehicle operation a particularly challenging endeavor.

NTSB investigations have found substance impairment as a cause or a contributing factor in numerous transportation accidents in recent years—and not just on the highway. Complex machinery such as cars, planes, trains, ships, and pipelines require operators to be at their best—not impaired by alcohol or drugs.

With more than 90 percent of transportation-related deaths each year occurring on our roadways, we look there first as we begin to define the problem.

In a 2013 AAA Foundation for Traffic Safety survey, 13 percent of drivers said they thought that they had driven close to or over the legal blood alcohol concentration (BAC) limit in the previous year. According to the Centers for Disease Control and Prevention, drivers make about 112 million alcohol-impaired trips each year.

According to the National Highway Traffic Safety Administration, the proportion of fatally injured drivers who had drugs in their system rose from 13 percent to 18 percent from 2005-2009. In 2012, 10.3 million people reported driving under the influence of illicit drugs in the past year.

But impairment isn't just a highway problem. The NTSB is seeing impairment-related accidents in all modes.

The NTSB recently studied drug use among fatally injured pilots. The prevalence of potentially impairing drugs increased from an average of 11 percent of fatally-injured accident pilots during the period from 1990-1997 to an average of 23 percent of accident pilots during the period 2008-2012. During the same time periods, positive marijuana results increased from 1.6 percent to 3.0 percent. But the most commonly found impairing substance in fatal crashes was diphenhydramine, a sedating antihistamine found in over-the-counter medications.

What can be done?

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[31] http://www.ntsb.gov/safety/mwl/Pages/mwl8-2016.aspx

When it comes to alcohol use, we know that impairment begins before a person's BAC reaches 0.08 percent, the current legal limit in the United States. In fact, by the time it reaches that level, the risk of a fatal crash has more than doubled. That is why states should lower BAC levels to 0.05— or even lower.

Unfortunately, for most drugs, the relationship between the amount consumed and crash risk is not well understood. We need more and better data to understand the scope of the problem and the effectiveness of countermeasures.

In commercial transportation industries, operators and enforcement authorities must not neglect required post-accident testing. Additionally, states should increase collection, documentation, and reporting of driver BAC test results, both for alcohol and drugs, following crashes.

Drivers and other transportation operators need good information to make informed decisions. While many recognize the impairment potential of illicit drugs, they may not appreciate the potentially impairing effects of prescribed or over-the-counter medications, especially in combinations.

Additionally, drivers of any vehicle type should discuss their transportation activities with their doctor before taking a medication, and discuss the impairing effect of any medical condition as it might increase their risk of having an accident. A person's medical condition and medications should not always exclude them from operating a vehicle, but such conditions and medications need to be monitored. If any medication label warns against operating heavy machinery, that warning includes vehicles.

Also, while the danger of drinking and driving is more broadly understood than that of driving under the influence of drugs, many do not know that even low levels of alcohol can degrade skills and increase crash risk.

Certain countermeasures have been shown to reduce the rate of alcohol-impaired driving and alcohol-related crashes, including stronger impaired driving laws and increased use of high-visibility enforcement, such as sobriety checkpoints.

Other countermeasures are needed to ensure that people who are caught driving while impaired (DWI) do not do so again. For example, requiring ignition interlocks for all alcohol impaired-driving offenders can ensure that vehicles will not start if the driver has been drinking. For repeat offenders, DWI courts (modeled after drug courts) provide a tailored approach that involves treatment and supervision.

Finally, emerging in-vehicle technology, such as the Driver Alcohol Detection System for Safety—a system that will use touch-based or breath-based systems to detect driver alcohol use—may one day ensure no drivers operate impaired.

DOT Response:

Substance impairment in transportation contributes to the deaths of thousands of members of the public, and DOT uses regulations, testing, education, research, and enforcement to reduce the safety impact of impairment in transportation. DOT tests safety-sensitive employees for marijuana and other specific drugs, and OST disseminated guidance to Medical Review Officers on the continued prohibition of marijuana, including the use of marijuana for recreational and medicinal purposes. FAA is working with the GAJSC to produce tools to help the general aviation community better understand the risks associated with medications, conducts timely post-incident drug and alcohol testing, maintains an informative Web site with educational materials and guidance, and continues enforcement of drug and alcohol testing regulations. FMCSA's drug and alcohol program targets high-risk carriers through field oversight efforts, and the Agency is in the process of drafting a final rule for a Commercial Driver's License Drug and Alcohol Clearinghouse as required by MAP-21. FMCSA also requested comment on a proposed form to communicate medication information from treating clinicians to Certified Medical Examiners. FRA is developing a training module to improve awareness of the impairing side effects of certain prescription and over-the-counter drugs. FTA unveiled two new prescription and over-the-counter pamphlets at its annual drug and alcohol National Conference, and continues to conduct audits of transit providing implementing drug and alcohol regulatory requirements. NHTSA continues research on Driver Alcohol Detection System for Safety (DADSS) technology. PHMSA issued a NPRM on pipeline safety in 2015 that expanded post-accident drug testing, and enforces its existing drug and alcohol regulatory requirements.

Office of the Secretary of Transportation:

Safety-sensitive employees in the commercial transportation industry are subject to the Department's drug and alcohol testing regulations in 49 CFR Part 40 and well as the Department's applicable Agency regulations. By statute, DOT is required to follow the Department of Health and Human Services (HHS) regarding the science of drug testing and the drugs for which we test. HHS, and therefore DOT, is limited to testing for Schedule I and Schedule II drugs only, as defined by the Controlled Substances Act. On May 15, 2015, HHS published a notice to change its Urine Mandatory Guidelines. Their proposal includes adding four synthetic opiates (oxycodone, oxymorphone, hydrocodone, and hydromorphone) to their drug testing panel. The Department of Transportation would welcome the addition of these synthetic opiates to the drug testing panel. Oxycodone, oxymorphone, hydrocodone, and hydromorphone are highly abused and addictive Schedule II drugs. Abuse by operators of trains, planes, pipelines, vessels, trucks, or buses could result in catastrophic outcomes for the traveling public.

According to Federal law, marijuana is a Schedule I, illegal drug. Under our Federally-regulated drug and alcohol testing program, marijuana use by safety-sensitive employees, including pilots, is not permitted. The Department tests for marijuana and other specific drugs. We have widely

disseminated guidance to DOT-qualified Medical Review Officers - who are licensed Medical Doctors or Doctors of Osteopathy - that medical and/or recreational marijuana use is not a legitimate medical explanation for a DOT positive drug test result. Similarly, we have done outreach to provide this information to DOT-regulated employers, employees and service agents who carry out the drug testing requirements under contract to the employers. Safety-sensitive employees who have a verified drug positive test result on a DOT-regulated test are required to be evaluated by a qualified Substance Abuse Professional (SAP), comply with the recommendations of the SAP, and have a negative test result on a return-to-duty test prior to returning to work. Subsequently, these individuals must undergo unannounced follow-up testing as recommended by the SAP.

Federal Aviation Administration:

The FAA takes substance abuse very seriously. Together, our regulations for post-accident testing and data collection, educational resources, and strong enforcement programs provide a powerful deterrent against the illicit use of drugs and misuse of alcohol by safety-sensitive employees in the commercial aviation industry. To date, our program has identified and removed more than 50,000 safety-sensitive employees from the aviation industry for drug and alcohol violations, in addition to other enforcement activities including civil penalties, certification suspensions, and certification revocations.

Post-Accident Testing

The FAA requires that each certificate holder for Parts 91K, 121, 135, and 145 operations obtain the Antidrug and Alcohol Misuse Prevention Program Operations Specification. We believe when this operation specification is issued, the principal operations inspectors have a clear understanding of the importance of conducting timely post-accident drug and alcohol testing.

Between August 14, 2012, and May 1, 2014, the FAA updated the "Frequently Asked Questions" sections of its Web site with additional questions and answers to raise employer awareness regarding post-accident drug and alcohol testing requirements. Subjects addressed include what constitutes a post-accident test; the definition of an accident; requirements for conducting drug and alcohol post-accident testing for safety-sensitive employees contributing to an accident; and requirements to report verified positive drug test results and alcohol misuse violations to the FAA.

The FAA also undertook several actions to assess and analyze data to better understand the problem and effectiveness of substance impairment countermeasures, including:

1. Development of a forensic toxicology laboratory methodology to perform analysis of designer drugs in postmortem fluids and tissues;
2. Assessment of the prevalence associated with the use of drugs in living pilots;
3. Development of a method for the analysis of cannabinoids in postmortem specimens;

4. Analysis of postmortem concentrations in human specimens obtained from aviation accidents, including opiates, benzodiazepines, anti-epileptics; paroxetine, tricyclics, and other drugs that can affect the human performance in aerospace operations;

5. Development of improved methods to discern between ethanol consumption and postmortem ethanol formation in forensic toxicology tissue specimens; and

6. Assessment of the prevalence of drugs and alcohol in pilots fatally injured in civil aviation accidents that occurred during 2009-2013.

Educational Resources

To promote understanding and voluntary compliance with the requirements of the drug and alcohol testing regulations, the FAA maintains an informative Web site containing educational material and guidance for aviation employers, pilots, and other safety-sensitive employees. The Web site includes Frequently Asked Questions, an educational video series, and a wide range of other resources to help educate and raise awareness among regulated employers and employees. This information is updated continuously based on input and questions from the industry, trends in noncompliance identified by inspections, changes in regulations or policy, and other feedback.

The General Aviation Joint Steering Committee (GAJSC) discovered the presence of impairing medications found postmortem in pilots involved in fatal GA accidents. In many cases, the impairing medication was available over the counter and a pilot could operate safely as a pilot in command as long as the proper amount of time passed between taking the medication and flying. As a result of this finding, it was determined some pilots may not always understand the proper wait time between taking a dose and flying or in some cases that a drug is considered impairing.

The GAJSC is working to produce tools to help the GA community better understand medications and the risks associated with sedating and impairing medications. The GAJSC also worked with the FAA Administrator and the senior leadership of the GA industry to address a joint letter to the GA community on the importance of not only understanding the medications they may be taking but understanding the underlying conditions causing their use. This outreach, conducted before the start of the 2014 summer flying season, along with other SEs designed to improve a pilot's understanding of medications and underlying conditions, will greatly help to reduce risks that stem from these issues.

Enforcement

Since 1986, FAA regulations have prohibited drug use by aviation safety-sensitive employees and required air carriers and other regulated aviation operators to establish drug testing programs. In 1991, FAA expanded its regulations to include alcohol misuse and require alcohol testing programs. The drug and alcohol testing regulations defined by Part 120 require regulated employers to test applicants for prohibited drugs before hiring them, to subject safety-sensitive employees to random drug and alcohol testing, test employees who show indications or signs of

possible drug use or alcohol abuse, test safety-sensitive employees after an accident, and conduct return-to-duty and follow-up testing of safety-sensitive employees who have successfully been rehabilitated after a drug or alcohol violation.

The drug and alcohol testing regulations are enforced by highly-trained FAA inspectors who inspect regulated employers' drug and alcohol testing programs and monitor their compliance on an ongoing basis. Under the FAA's Compliance and Enforcement Program, we take consistent and appropriate action against regulated entities that fail to comply with the drug and alcohol testing regulations. The FAA conducts random unannounced drug and alcohol testing on employees in safety-sensitive positions in accordance with Department of Transportation guidelines. Each year, the FAA collects testing, enforcement, and other program data from regulated employers and analyzes it to evaluate the effectiveness of our testing program.

Federal Motor Carrier Safety Administration

FMCSA is committed to ensuring that only safe commercial drivers and motor carriers are allowed to operate on our roads. FMCSA improves truck and bus safety through education, regulation, enforcement, research, and innovative technology.

In Fiscal Year (FY) 2015, 991 violations for use or possession of drugs or alcohol were cited against CMV drivers as a result of roadside inspection activity. Of these violations, 598 were drug related while 393 were alcohol related. FMCSA will continue targeting high-risk carriers through field oversight efforts such as investigations, safety audits, and roadside inspections to make certain that unsafe commercial drivers are removed from the Nation's highways.

FMCSA has reviewed extensive public comments received in response to the NPRM for the Commercial Driver's License Drug and Alcohol Clearinghouse and is in the process of drafting the final rule. The rule as proposed would establish a database under the Agency's administration that will contain drug and alcohol test result information for the holders of commercial driver's licenses. The proposed rule, mandated by Section 32402 of the Moving Ahead for Progress in the 21st Century Act (MAP-21), would require FMCSA-regulated motor carrier employers, Medical Review Officers, Substance Abuse Professionals, and consortia/third party administrators supporting DOT drug and alcohol testing programs to report verified positive, adulterated, and substituted drug test results, positive alcohol test results, test refusals, negative return-to-duty test results, and information on follow-up testing to the Clearinghouse. The proposed rule would also require employers to report actual knowledge of traffic citations for driving a commercial motor vehicle while under the influence of alcohol or drugs. The proposed rule would establish the terms of access to the database, including the conditions under which information would be submitted, accessed, maintained, updated, removed, and released to prospective employers, current employers, and other authorized entities. With respect to State access, the rule proposes that a chief commercial driver's license official from each State would be granted access to information in the Clearinghouse.

In addition, on November 25, 2015, FMCSA requested public comment on its plan to implement a new form that may be used on a voluntary basis by healthcare professionals in its National Registry of Certified Medical Examiners to communicate with treating clinicians who are responsible for prescribing certain medications. The medical examiners are responsible for issuing medical certificates for interstate truck and bus drivers. The new form would ensure the medical examiners fully understand the reasons the medications have been prescribed by the treating clinician and it would ensure that there are no disqualifying medical conditions, underlying medical conditions, or prescribed medications that could adversely affect the driver's ability to safely operate commercial motor vehicles on the Nation's highways.

In coordination with the OST's Office of Drug and Alcohol Policy and Compliance, FMCSA routinely provides a featured speaker at the Drug and Alcohol Testing Industry Association, the Federal Transit Administration, and the Substance Abuse Program Administrators Association conferences, which each attract over 500 attendees. During the conferences, FMCSA provides information about the FMCSA Drug and Alcohol program as well as the safety risks regarding the use of prescription medications.

Federal Railroad Administration:

To improve awareness of the potentially impairing side effects of certain prescription and over-the-counter drugs, FRA is developing a training module that will be made available for free on its Web site. The module will contain over 100 slides with suggested talking points and information on commonly used drugs and appropriate restrictions.

FRA appreciates the NTSB's recognition of the efficacy of FRA's post-accident testing program. However, the NTSB had concerns about why FRA conducts post-accident testing on the blood specimen only when the urine testing result is above a predetermined reporting cut off. Typically, blood specimens are collected four to eight hours after a post-accident event occurs; recently ingested substances are generally detectable in urine after four hours. FRA therefore requires the urine sample to be tested first. If the urine sample is dilute, shows any anomalies, or indicates a substance is present (even if below the cut-off levels), FRA analyzes the blood specimen. This protocol has proven effective.

Federal Transit Administration:

Since the Omnibus Transportation Employee Testing Act of 1991 required transit employers to drug and alcohol test safety sensitive employees, the FTA has developed a robust training and technical assistance program to assist employers with addressing how they can detect, deter, and prevent drug use and alcohol misuse in the transit environment. Annually, FTA conducts approximately 60 audits of transit providers implementing 49 CFR Part 655 (Prevention of Alcohol Misuse and Prohibited Drug Use in Transit Operators), and up to 120 clandestine, unannounced audits of drug and alcohol collection testing vendors implementing 49 CFR Part 40

(Procedures for Transportation Workplace Drug and Alcohol Testing Programs). During these audits we ask a series of questions with respect to how the employer addresses the issue of prescription/over-the counter drugs with their safety sensitive employees and what measures, if any, the provider has put in place.

Since the implementation of the Compliance Audit Program in 1996, FTA has addressed emerging issues identified during audits of the transit industry through the production of videos, laminated decision cards, toolkits, and guidance documents specifically targeting these identified emerging issues. Annually, FTA conducts a drug and alcohol National Conference where a range of topics are covered. Each year, a prescription/over the counter drug training session is held to educate transit providers on how to work with their safety sensitive employees in educating their personal physicians about their job function. At the 2015 conference, FTA unveiled two, prescription/over the counter drug, pamphlets aimed at educating employees and medical providers in making the right medication choice for safety-sensitive employees.

National Highway Traffic Safety Administration:

Annually, NHTSA organizes nationwide crackdowns with law enforcement to reduce impaired driving, with concentrated efforts during Memorial day weekend and during the December holidays. On December 17, 2015, US DOT and NHTSA announced the annual holiday crackdown with the unveiling of a new Drive Sober or Get Pulled Over ad that ran in movie theaters immediately before the blockbuster Star Wars: The Force Awakens. The ad, "Man in the Mirror[32]," depicts a young man's reflection in the mirror after a night of drinking where the reflection in the mirror tries to convince him that he's OK to drive. Another version depicts a young woman in the same scenario, a first for the agency. Both ads show the people who have been drinking can't be trusted to properly judge where they are sober enough to drive. The ads ran until January 1, 2016, via television, digital outlets, and thousands of theaters across the nations, and mark another innovative approach to the use of advertising in conjunction with high-visibility enforcement campaigns to combat impaired driving.

On June 4, 2014, NHTSA joined members of Congress, safety advocates and industry representatives at the U.S. DOT headquarters to highlight advances in the Driver Alcohol Detection System for Safety (DADSS) program, a research partnership between NHTSA and an industry consortium to develop technology to prevent alcohol-impaired drivers from operating their vehicles while under the influence. The event featured the unveiling of a test vehicle equipped with mock-up DADSS technology that researchers will use to examine driver interactions with the system.

Since 2008, NHTSA and the Automotive Coalition for Traffic Safety (ACTS) have collaborated on DADSS research. In addition to a testing vehicle, the event included displays of the two

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[32] Man in the Mirror Public Outreach Advertisement. http://www.nhtsa.gov/drivesober/ NHTSA Web site.

technology prototypes under development – one that detects alcohol levels by touch, another by sensing the driver's breath – to show progress in maturing them for automotive use. The project's objective is to complete the necessary research within the next 5 years that would support the introduction of technologies into the vehicle fleet. For more information on the Driver Alcohol Detection System for Safety (DADSS), please visit DADSS.org.

NHTSA has also been working on reducing the drug impaired driving problem through a multifaceted approach that includes data collection to provide a better understanding of the nature and scope of the drug impaired driving problem, the development and dissemination of tools for law enforcement, prosecutors and judges, and recommendations for improvements to State laws pertaining to drug impaired driving.

Regarding the issue of improving our understanding of the scope and magnitude of drugged driving, NHTSA has conducted several projects to collect never before available data on the use of drugs by drivers and the risk of driving after drug use. One study, the latest version of NHTSA's Roadside Survey of Alcohol and Drug Use by Drivers, found that the number of drivers with alcohol in their system has declined by nearly one-third since 2007, and by more than three-quarters since the first Roadside Survey in 1973. But that same survey found a large increase in the number of drivers using marijuana or other illegal drugs. In the 2014 survey, nearly one in four drivers tested positive for at least one drug that could affect safety[33].

A second study, the largest of its kind ever conducted, assessed whether marijuana use by drivers is associated with greater risk of crashes. The survey found that marijuana users are more likely to be involved in accidents, but that the increased risk may be due in part because marijuana users are more likely to be in groups at higher risk of crashes. In particular, marijuana users are more likely to be young men – a group already at high risk. The study, conducted in Virginia Beach, Va., gathered data over a 20-month period from more than 3,000 drivers who were involved in crashes, as well as a comparison group of 6,000 drivers who did not crash. The study found that drivers who had been drinking above the 0.08 percent legal limit had about 4 times the risk of crashing as sober drivers and those with blood alcohol levels at 0.15 percent or higher had 12 times the risk.

NHTSA plans a series of additional studies to further understand the risk of drugged driving, including a study of alcohol and marijuana and other drug use in Washington State before and after retail sales of marijuana stemming from the legalization of recreational use. We are also completing a study with the National Institute on Drug Abuse using the National Advanced Driving Simulator to assess how driver behavior is affected by marijuana use.

To assist law enforcement officers to identify and arrest drug-impaired drivers, NHTSA has developed several training programs that include the Standardized Field Sobriety Test (SFST),

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[33] Results of the 2013-2014 National Roadside Survey of Alcohol and Drug Use by Drivers. Traffic Safety Facts February 2015 file:///H:/2015/Downloads/812118-Roadside_Survey_2014.pdf

the Advanced Roadside Impaired Driving Enforcement (ARIDE) program, which is available as an instructor led program and is available as an online course of instruction, and the Drug Evaluation and Classification Program (DECP), now operated by the International Association of Chiefs of Police (IACP), that provides more intensive training in recognizing the signs and symptoms of drug use and results in officers being certified as Drug Recognition Experts (DREs).

NHTSA is also conducting research on oral fluid drug screening devices for law enforcement use in the field. Currently, obtaining test results to determine whether a suspect has recently used drugs involves drawing a blood sample (typically at a hospital), shipping it to a laboratory for toxicological testing, and then waiting weeks or months to get the results back. These new generation devices allow an officer to take a small saliva sample from a suspect, insert it into a portable device and get an indication of drug use within minutes.

To assist criminal justice professionals in preparing for and adjudicating drug-impaired driving cases, NHTSA has developed training for prosecutors (offered through the National Association of Prosecutors) and educational programs for judges (offered through the National Judicial College). To assist States to update their impaired driving laws, NHTSA has also made recommendations regarding ways to strengthen their impaired driving laws to more adequately deal with the drug impaired driver.

Pipeline and Hazardous Materials Safety Administration:

For more than 25 years, PHMSA has required operators under 49 CFR Part 199 to conduct drug and alcohol testing of covered employees who perform operation, maintenance, or emergency-response functions regulated by 49 CFR Parts 192, 193, or 195. PHMSA enforces its drug and alcohol testing regulations with routine inspections of its covered employers and service agents. Each year, a representative from PHMSA is a highlighted speaker at the Drug and Alcohol Testing Industry Association conference and the Substance Abuse Program Administrators Association conference. Through these two conferences, we provide outreach to more than 1,000 employers, service agents, and other interested parties in the transportation industry. At these conferences, PHMSA provides education on regulatory requirements, interpretations of their rule, and best practices.

On July 10, 2015, PHMSA issued the NPRM Pipeline Safety: Operator Qualification, Cost Recovery, Accident and Incident Notification, and Other Pipeline Safety Proposed Changes. This NPRM proposes changes as a result of an NTSB safety recommendation to PHMSA dated September 26, 2011. The NTSB has stated it believes PHMSA's proposal to modify the criteria used to make decisions about conducting post-accident drug and alcohol tests, and to require operators to keep a record of the reason why post-accident drug and alcohol tests were not conducted, is responsive to their recommendation. PHMSA is in the process of drafting the final rule.

9. Require Medical Fitness for Duty[34]

What is the issue?

When safety-critical personnel, such as public vehicle operators, have untreated medical conditions that prevent them from doing their jobs effectively, people can be seriously injured or die. In fact, they have done so in many accidents investigated by the NTSB. Requiring medical fitness for duty can prevent the accidents leading to these and other tragic outcomes.

In two train accidents—one in 1996 in Secaucus, New Jersey, and one in 2012 in Goodwell, Oklahoma—the engineers lacked the ability to see and interpret wayside signals due to deficient color vision. In a July 2002 aviation accident, a FedEx Boeing 727 flew into the ground while approaching the Tallahassee, Florida, airport because the flying pilot had a severe color vision deficiency which made it difficult for him to correctly identify the color of the airport's PAPI lights that were warning that the flight was too low.

In 2013, in the Bronx, New York, an engineer operated his train at 82 miles per hour into a curve with a speed restriction of 30 miles per hour. The train derailed, killing four and injuring 61. Undiagnosed sleep apnea affected the engineer's physical condition at the time of the accident. A week following the accident, his condition was diagnosed and subsequently successfully treated—but it was already too late.

It has long been recognized that untreated or undiagnosed medical conditions pose a safety risk to the traveling public. However, medical certification for safety-critical personnel varies across the modes of transportation.

For instance, medical certifications for railroad engineers are renewed every three years, and they cover only vision and hearing standards. The U.S. Coast Guard requires commercial ship captains to get comprehensive medical exams at regular intervals, but relies on mariners to self-report medical conditions and medication use.

For commercial drivers, the Federal Motor Carrier Safety Administration recently has required training and certification for health care providers who perform medical examinations. However, there is no mechanism to ensure recommended guidelines are followed. Moreover, chiropractors and other healthcare professionals with no experience prescribing medications are considered acceptable medical examiners.

The aviation medical certification system may be the most robust, but pilots are increasingly testing positive for over-the-counter sedating medications.

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[34] http://www.ntsb.gov/safety/mwl/Pages/mwl9-2016.aspx

Moreover, although the NTSB has found that obstructive sleep apnea has been a factor in multiple accidents, most transportation modes still lack a complete screening process for this condition.

What can be done?

The NTSB has made recommendations for a comprehensive medical certification system for safety-critical transportation personnel that includes these features:

- *a complete medical history of the applicant, taken at prescribed intervals, that includes medications, conditions, and treatments as well as a physical examination;*
- *specific historical questions and physical examination procedures to identify applicants at high risk for sleep disorders;*
- *identification of specific conditions, treatments, and medications that initially disqualify applicants for duty, with certification contingent on further testing (specific to each condition);*
- *explicit and uniform processes and criteria for determining when the applicant has a treated, but otherwise disqualifying, condition;*
- *certificates that are good only for a limited time for applicants with conditions that are currently stable but known to be likely to deteriorate, to ensure appropriate retesting;*
- *medical examiners who:*
    - *are licensed or registered to both perform examinations and prescribe medication in a given state;*
    - *are specifically trained and certified to perform medical certification exams; and*
    - *have ready access to information regarding disqualifying conditions that require further evaluation.*
- *a review system for medical examiners' work product(s) with both the information and capacity to identify and correct errors and substandard performance;*
- *the capacity to prevent applicants who have been deferred or denied certification from finding another provider who will certify them;*
- *a process for dealing with conditions which could impair safety and are diagnosed between certification exams; and*
- *guidance for medical providers that should be used when the provider believes a medical condition disqualifies an individual for duty.*

The goal is simple: ensure safety-critical professionals are medically fit for duty before they operate a vehicle.

DOT Response:

The Department believes safety-critical personnel must be able to effectively perform their jobs, and medical fitness for duty initiatives ensure that these individuals are regularly screened so that

their health does not affect safety. FAA works diligently to maintain and update certification standards, and has a medical priorities agenda to pursue. FCMSA continues to execute the Medical Examination Certificate requirements that took effect in 2014. FRA, in coordination with FMCSA and OST, issued an ANPRM on obstructive sleep apnea to inform future decisions on regulatory actions. FTA recently released a report on fatigue management requirements for a transit fitness for duty program. PHMSA is in the early stages of developing medical standards for its inspection and investigation workforce.

Federal Aviation Administration:

The FAA is responsible for protecting the safety of people who fly as well as the lives and property of people on the ground. The FAA continuously works with the aviation and medical communities to maintain medical certification standards to keep our skies safe. The FAA's top medical priorities are described below.

- Evaluation of trends in missed diagnoses during medical certification processes based on forensic toxicology data.
- Evaluation of diabetes, including insulin-dependent pilots to determine effectiveness of current medical certification processes.
- Assessment of pilots with waivers for glaucoma to determine glaucoma's characteristics, involvement in specific accidents, and associations with all-cause accident risk.
- Evaluation of the impact of advanced prosthetic devices as it relates to the medical certification process.
- Assessment of the characteristics and outcomes for Statement of Demonstrated Ability type aeromedical waivers.
- Assessment of fatal accidents to determine reporting accuracy of medical certification applications and provide insight on possible corrective measures.
- Evaluation of the introduction of new medical conditions for which AMEs can issue a medical certificate.

The entire medical certification process attempts to assess the ongoing risk of chronic or recurrent medical conditions using the best clinical and aerospace medicine information available. The decision to not grant a medical certificate reflects a concern that the risk of sudden or subtle incapacitation exceeds an acceptable level and the individual is not fit to fly on a long term basis. Far less than one percent of airmen are denied medical certificates.

Federal Motor Carrier Safety Administration:

FMCSA is committed to ensuring that only physically qualified commercial drivers operate on our nation's roadways. On May 21, 2014, a new regulation took effect requiring all interstate CMV drivers to receive a Medical Examination Certificate (MEC) from qualified professionals listed on FMCSA's National Registry of Certified Medical Examiners. To become certified,

qualified medical examiners must be trained and tested on FMCSA's driver physical qualification standards. The medical examiner certification requirement makes our roads safer by ensuring the examiners qualifying drivers know the minimum Federal physical qualifications.

FMCSA data shows that, as of February 1, 2016, there are approximately 46,000 certified medical examiners on the National Registry. Between May 21, 2014, and February 1, 2016, certified medical examiners conducted 8,567,502 medical examinations of commercial motor vehicle drivers. Of these medical examinations, 60.9 percent (5,043,107) yielded a 2-year MEC (the maximum period allowed), 32.0 percent (2,654,873) yielded a 1-year MEC, 5.5 percent (454,614) yielded a 3-month MEC, and 1.6 percent (130,117) yielded a less than 3 month medical card. Additionally, 2.5 percent (212,443) of the drivers examined were temporarily disqualified while 0.8 percent (70,279) of the drivers were determined to be medically unqualified.

FMCSA recognizes the NTSB's concern that a brief training program for certifying medical examiners cannot replace formal courses in pharmacology or experience prescribing medications. However, per 49 CFR 390.103, a person is eligible to receive medical examiner certification if the person is:

1. Licensed, certified, or registered in accordance with applicable State laws and regulations to perform physical examinations. The applicant must be an advanced practice nurse, doctor of chiropractic, doctor of medicine, doctor of osteopathy, physician assistant, or other medical professional authorized by applicable State laws and regulations to perform physical examinations;
2. Completes a training program that meets the requirements of § 390.105; and
3. Passes the medical examiner certification test provided by FMCSA and administered by a testing organization that meets the requirements of § 390.107 and that has electronically forwarded to FMCSA the applicant's completed test and application information no more than three years after completion of the training program required by paragraph (a)(2) of this section.

FMCSA has provided the framework at the Federal level to train, test, and certify medical professionals seeking to become a medical examiner. The decision to include subsets of medical professionals among the ranks of those qualified to perform occupational health assessments of commercial vehicle drivers within individual States resides with the respective State medical licensing authorities under the applicable provisions of State statutes and regulations.

FMCSA believes the data related to medical examinations conducted to date by the certified medical examiners clearly documents their knowledge of the physical qualifications required of commercial motor vehicle drivers. The fact that nearly 40 percent of the drivers examined

receive less than the standard 2-year medical certification demonstrates the MEs knowledge of physical conditions that affect driver performance and require more frequent examination to ensure the limiting medical condition has not worsened. An additional benefit of the National Registry is that drivers who previously received medical certifications from less qualified MEs are now receiving treatment for medical conditions that were either ignored or undetected, resulting in overall improvement of the health of the driver population.

Federal Railroad Administration:

FRA is addressing railroad employees' medical fitness for duty sequentially based on NTSB accident investigations of railroad accidents. For example, FRA, in coordination with FMCSA and OST, issued an ANPRM on obstructive sleep apnea to inform decisions on regulatory actions and the most effective and efficient tools to address safety risks associated with the condition. After it has fully considered how to address OSA, FRA will then consider strategies to address other medical conditions that are contributing causes to accidents.

In addition, FRA issued an interim interpretation to clarify its locomotive engineer and conductor qualification and certification regulations with respect to vision standards and testing. The interpretation was published in the Federal Register on November 24, 2015, and addresses further evaluation of persons who do not meet the regulatory vision threshold. It also provides best practices guidance for designing valid, reliable, and comparable vision field tests for assessing whether persons who do not meet those thresholds can perform safely as locomotive engineers and conductors. FRA is currently reviewing comments on its interpretation and will respond to them and finalize the interpretation later this year.

FRA believes that no medical condition should be disqualifying if the medical condition is adequately treated such that a safety-critical railroad employee can safely perform service.

Federal Transit Administration:

As mentioned above, the FTA tasked TRACS to conduct the research and analysis necessary to lay a foundation for requirements related to the fatigue management, which FTA believes should be a factor in a transit fitness for duty program. Specifically, FTA tasked TRACS to develop recommendations on the key elements that should comprise an SMS approach to a fatigue management program and identify the major organizational and behavioral challenges that may be faced in addressing transit employee fatigue, leveraging lessons learned from other modal organizations in implementing their strategies. FTA recently received a report[35] from TRACs and is evaluating the recommendations.

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[35] Establishing a Fatigue Management Program for the Bus and Rail Transit Industry. Transit Advisory Committee for Safety (TRACS) 14-02 Report http://www.fta.dot.gov/documents/TRACS_Fatigue_Report_14-02_Final_(2).pdf 7/30/2015

<u>Pipeline and Hazardous Materials Safety Administration</u>:

Although PHMSA currently has no plans for medical fitness for duty requirements in the pipeline industry, PHMSA is in the early stages of developing medical standards for its inspection and investigation workforce. Following an in-depth analysis of work conditions, physical hazards and the environment the PHMSA workforce routinely encounters, PHMSA has made a determination that its workforce is being placed into "arduous and dangerous" (in accordance with 5 CFR 339) situations that warrant the development of a program and will make a recommendation to PHMSA leadership for approval in Spring 2016.

10. Expand Use of Recorders to Enhance Transportation Safety[36]

What is the issue?

Transportation operators and investigators must know what happened in an accident to help prevent such an accident or mitigate the damage done in any future recurrence. No single tool has helped determine what went wrong more than recorders.

Yet, certain categories of aircraft, trains, ferries, and buses are still not equipped with these critical technologies.

For example, the NTSB has seen how an event data recorder in a motorcoach would have provided information after a crash about what may have gone wrong with the vehicle, how occupants were killed or injured, and what safety devices and systems were employed, if any.

In other cases, data and/or voice recorders may have been present, but some questions could only have been answered through the data provided from an image recorder. Image recordings can help to fill in the gaps by providing investigators and operators first-hand knowledge of crew/driver activities, for example in the cab of a train.

The information gleaned from image recordings can help operators improve operational and safety oversight. While some operators have implemented—or are in the process of implementing—image recorder programs and systems, there are no regulatory requirements to do so. So, most operators do not.

What can be done?

Crash-resistant data, audio, and image recorders are readily available and can be easily installed in vehicles, vessels, and aircraft that currently do not require crash-hardened recorders. Regulations should require their use, but until that time, operators should proactively procure this technology to improve the operational and safety oversight of their fleets, trains, aircraft, or vessels. The NTSB urges the following actions:

- *In aviation, the NTSB recommends the use of cockpit image recorders. We also suggest equipping smaller turbine-powered aircraft with image-recording devices and transport-category and Helicopter Emergency Medical Service rotorcraft with flight recorders. The NTSB encourages operators across the industry to routinely review recorded information in structured programs.*
- *In rail, the NTSB recommends focusing on equipping locomotive cabs with audio and image recorders, equipping some light rail vehicles with recorders, and railroads use recorded information for operational and safety oversight.*

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[36] http://www.ntsb.gov/safety/mwl/Pages/mwl10-2016.aspx

- *In marine, the NTSB recommends equipping ferry vessels with voyage data recorders so investigators can better determine the cause of accidents.*
- *In highway, the NTSB recommends implementing on-board video recording systems (see NTSB/SR-15/01). The NTSB suggests equipping buses and trucks with event data recorders, equipping heavy commercial vehicles with video event recorders, and motor carriers use recorded information for operational and safety oversight.*

DOT Response:

The Department agrees with the NTSB that the use of recorders could provide additional insights on incidents to inform DOT's safety activities; however, due to privacy, security, and cost considerations each Operating Administration must carefully consider the most appropriate implementation of recorder technology. The DOT activities related to event recording include rulemaking, guidance, and collaboration with stakeholders. The FAA published a Final Rule on rotorcraft flight recorders, works with program partners to detect emerging hazards using flight recorder data, provides cockpit voice recorder (CVR) guidance to industry, and is considering technology to enable the recording of aircraft displays in coordination with the International Civil Aviation Organization (ICAO). FMCSA published a final rule on electronic logging devices for Hours of Service requirements, is developing guidance for motor carriers implementing onboard safety monitoring (OSM) technology, is working to incorporate new safety technologies and practices into the Beyond Compliance program, and will be initiating a rulemaking to address the FAST Act requirements on windshield technology. FRA is preparing a NPRM requiring intercity passenger and commuter rail carriers to install inward- and outward-facing image recording devices. FTA continues to work with transit industry stakeholders to develop voluntary, consensus-based event data recorder standards for rail transit vehicles.

Federal Aviation Administration:

Alternatives to Cockpit Image Recorders

The FAA and the international community are considering alternative technology to enable recording of aircraft displays to provide accident investigators an accurate picture of the information displayed to flight crews. During the September-October 2015 meeting of ICAO's Flight Recorder working group, representatives from both the FAA and the Board expressed support for discussion of technology recording inputs taken directly from aircraft displays, as opposed to recording information taken from the sources that provide information to aircraft displays. This technology would provide investigators with a clear picture of the information presented to flight-crews without the associated privacy and legal concerns of image recorders. The FAA currently plans to continue discussion with the working group that could lead to proposal of new ICAO Standards and Recommended Practices (SARPs).

Furthermore, the FAA is in the process of developing policy related to accident site location and retrieval of flight data. Once ICAO finalizes proposed revisions to Annex 6 SARPs intended to

enable the concept of operations for a proposed Global Aeronautical Distress and Safety System, the FAA will be able to determine standards for a performance-based policy taking into account current aircraft equipage, operator capabilities and risk mitigations, and technologies available both currently and in the near future. This policy will consider a "whole system/operation" approach combining overall aircraft and ground systems, acceptance of risk based on specific operations and in-place mitigations, benefit to the public, and the economic burden placed on aircraft owners and operators.

The FAA does not intend to mandate the equipage of cockpit image recorders at this time due to privacy and security considerations, as well as the cost that equipage and maintenance would pose aircraft owners and operators when balanced with benefit to the public. While image recordings are undoubtedly of value to accident investigators, they present a very real privacy concern within the commercial pilot community. Accidental or unauthorized release of image recordings may have devastating effects on family members of flight deck crew members involved in accidents, and could involve extensive legal implications concerning many aviation industry organizations.

The FAA also has an obligation to put forward rules that are both clearly in the public interest and economically justified. While the cost of some image recording systems is low in comparison to parametric digital flight data recorders, they still represent a major investment for owners of aircraft operating under Part 91. The FAA does not possess any data justifying the cost burden that would be placed on owners and operators by mandating equipping GA aircraft with image recorders.

Rotorcraft Flight Recorders

On February 21, 2014, the FAA published the Helicopter Air Ambulance, Commercial Helicopter, and Part 91 Helicopter Operations Final Rule (79 FR 9932), which addresses operations for helicopter air ambulances, commercial helicopters, and GA helicopters. This final rule addresses the Board's suggestion to equip helicopter emergency medical service rotorcraft with flight recorders by establishing requirements that helicopter air ambulances be equipped with a flight data monitoring system to promote operational safety and provide critical information to investigators in the event of an accident. This final rule also revises requirements for equipment, pilot testing, and alternate airports for commercial helicopter operations intended to increase safety by providing certificate holders and pilots with additional tools and procedures to help prevent accidents.

Review of Recorded Information

The ASIAS program partners with CAST and the GAJSC to monitor known risks, evaluate the effectiveness of risk mitigations, and detect emerging hazards by bringing together 185 data sources. GA ASIAS is the expansion of the commercial ASIAS program designed to improve safety by incorporating new voluntary GA data sources submitted by the community, including

data ranging from corporate operators flying large aircraft to small, homebuilt, and experimental aircraft.

GA ASIAS will serve as the basis for an individual pilot to directly contribute to improving aviation safety by providing tools to analyze their own data, and use new data such as pilot safety reports, manufacturer reports, and flight data from mobile devices. Many operators in the corporate community will also be able to integrate their existing FDM programs into ASIAS. Data may also be included from small turbine, turboprop, and reciprocating aircraft from either onboard avionics or combining mobile app information with an external attitude and heading reference system unit. The FAA sponsors the development of tools to help pilots analyze these data. These tools, together with ASIAS, can help the GA community better understand their data and hopefully discover any risks that could lead to an accident.

Additionally, the FAA decided to extend the parameters of retaining audio, written, and recorded data from 15 days to 45 days to ensure a uniform standard for data retention, as well as enable the FAA to provide necessary and timely communication recordings requested by the Board. Currently, we developed a document change proposal to FAA Order JO 7210.3, Facility Operations and Administration, and anticipate publication in May 2016.

CVR Policies and Installation Guidance

The FAA provides cockpit voice recorder (CVR) guidance through two different means: Technical Standard Orders (TSO) and ACs. A TSO documents the design requirements for devices intended for installation and use aboard aircraft, but TSO approval does not give authority to install that device. Since a TSO article may be installed on a variety of aircraft, it does not provide installation guidance, for which manufacturers may have little control. Installation guidance is contained in ACs, which give installers and operators acceptable means of compliance for installation.

Although the FAA reviewed existing CVR policies and installation guidance addressing the quality of the inflight portion of audio data and found TSO guidance to be appropriate, we determined that the guidance contained in AC 25.1457-1A, CVR Installations, dated November 11, 1969, needs to be updated. We are currently developing a new AC to provide installation guidance including installed performance in actual operation, and anticipate publication in July 2016.

<u>Federal Motor Carrier Safety Administration</u>:

On December 16, 2015, FMCSA published the Electronic Logging Devices and Hours of Service Supporting Documents final rule in the Federal Register. The rule requires most commercial motor vehicle drivers who are required to keep records of duty status (RODS) to use ELDs by December 18, 2017. The requirements for ELDs will improve compliance with the HOS rules. Specifically, the rule: (1) requires new technical specifications for ELDs that address

statutory requirements; (2) mandates most drivers currently required to keep RODS to use ELDs; (3) clarifies supporting document requirements so that motor carriers and drivers can comply efficiently with HOS regulations; and (4) adopts both procedural and technical provisions aimed at ensuring that ELDs are not used inappropriately against commercial motor vehicle drivers.

Additionally, FMCSA tasked the National Surface Transportation Safety Center for Excellence at Virginia Tech to develop a manual for use by fleet management personnel prior to implementing onboard safety monitoring (OSM) technology, or for carriers that have implemented an OSM device but are having problems achieving results. The guidance document was completed on March 3, 2015, but was held pending publication of the final rule. FMCSA is currently preparing to announce the availability of the guidance document to all motor carriers.

With respect to video event recorders, Section §393.60(e) of 49, Code of Federal Regulations requires devices mounted at the top of the windshield to be located (1) not more than 6 inches below the top of the windshield, (2) *outside the swept area of the windshield wipers*, and (3) outside the driver's sight lines to the road and highway signs and signals. However, for optimal effectiveness, the forward lens of video event recorders must be mounted *within the swept area of the windshield wipers* for a clear view in inclement weather.

Since April 2009, FMCSA has allowed (via a temporary exemption that was subsequently renewed in 2011, 2013, and 2015) video event recorders to be used in CMVs provided they are mounted not more than 2 inches below the upper edge of the area swept by the windshield wipers, and outside the driver's sight lines to the road and highway signs and signals. The current exemption expires on April 16, 2017. FMCSA is not aware of any degradation in safety due to the use of video event recorders, mounted within the swept area of the windshield in accordance with the provisions of the temporary exemption.

Based on the above and in response to Section 5301 of the FAST Act, "Windshield Technology," FMCSA plans on initiating a rulemaking to amend Section §393.60(e) to permit certain devices to be mounted within the swept area of the windshield of CMVs. The Agency believes that amending Section §393.60(e) to expressly allow devices such as video event recorders to be mounted in the swept area of the windshield will prompt more motor carriers to voluntarily adopt such technology.

In addition to the above, FMCSA published a Federal Register notice on April 23, 2015, requesting comments and input regarding the potential development of a *Beyond Compliance* program, as required under the FAST Act § 5222, that would:

- Identify new safety technologies and safety management practices that the Agency wants to incentivize for early adoption;

- Determine the incentives for voluntary adoption; and
- Monitor ongoing compliance of early adoption.

FMCSA is in the process of evaluating (1) comments received in response to the notice, and (2) recommendations from the Motor Carrier Safety Advisory Committee (MCSAC), on the potential benefits and feasibility of a *Beyond Compliance* program. The MCSAC specifically included video event recorders as a potential safety technology for inclusion in a *Beyond Compliance* program.

Federal Railroad Administration:

Inward- and Outward-Facing Image Recording Devices

FRA has been preparing an NPRM for regulations requiring intercity passenger and commuter rail carriers to install inward- and outward-facing image recording devices in all controlling locomotives of passenger trains.   The rulemaking will also implement the FAST Act provision requiring installation of recording devices on passenger trains. In preparing the NPRM, FRA is considering relevant NTSB safety recommendations, FRA's Railroad Safety Advisory Committee (RSAC) Working Group, and recent FRA investigations of accidents and other railroad safety violations. Prior to enactment of the FAST Act, FRA had engaged RSAC on the subject of locomotive recording devices, and FRA announced in May 2015 that it would publish an NPRM addressing that topic.

Some rail carriers either have begun installing inward-facing cameras or announced that they will begin such installation, including the four largest U.S. freight railroads (Union Pacific Railroad, BNSF Railway Co., CSX Co., and Norfolk Southern Corp.). Amtrak also announced that it would install inward-facing cameras on certain locomotives in service on the Northeast Corridor. In addition, Metro-North Railroad and the Long Island Rail Road, the two busiest U.S. commuter railroads by weekday ridership, have announced they will begin installing inward- and outward-facing cameras on their locomotives.

Federal Transit Administration:

The FTA recognizes the value of event data recorders for purposes of accident reconstruction and has worked with the transit industry stakeholders to develop voluntary, consensus-based standards for rail transit vehicles. FTA encourages rail transit agencies to make enhancements during vehicle retrofits and overhauls, and recommends that public transportation agencies include event data recorders that comply with Rail Transit Vehicle Event Recorders Standards[37] or equivalent, to the extent practicable.

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[37] The Institute of Electrical and Electronics Engineers Standards Association Standard 1482.1-2013, IEEE Standard for Rail Transit Vehicle Event Recorders. http://standards.ieee.org/findstds/standard/1482.1-2013.html

Conclusion

The U.S. Department of Transportation's top priority is safety. Through strong leadership, regulations, enforcement, collaboration with stakeholders, guidance, financial assistance, training, education, and outreach the Department uses its role as the world's leader in transportation safety to reduce fatalities, injuries, and crashes that occur in transportation. As highlighted in this report the Department is actively pursuing and improving safety initiatives in the areas identified in the NTSB's 2016 Most Wanted List. Continuous improvement is never a completed activity, and DOT welcomes the opportunity to continue the dialogue on safety with NTSB, Congress, safety stakeholders, and the public. The Department has made recent, noteworthy progress in enhancing transportation safety, and we will continue to carry out our mission to serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system for the American people, today and into the future.