

# National Transportation Safety Board

## Fiscal Year 2018 Budget Request





## National Transportation Safety Board

Washington, DC 20594 | [www.nts.gov](http://www.nts.gov)

OFFICE OF THE VICE CHAIRMAN

May 23, 2017

The Honorable Michael R. Pence  
President  
United States Senate  
Washington, DC 20510

The Honorable Paul D. Ryan  
Speaker  
United States House of Representatives  
Washington, DC 20515

Dear Mr. President and Mr. Speaker:

The National Transportation Safety Board (NTSB) is an independent federal agency responsible for investigating and determining the probable cause of every civil aviation accident and significant accidents in other modes of transportation - railroad, highway, marine and pipeline. We develop and advocate recommendations to prevent future accidents or reduce their effects in terms of loss of life, injury, or damage to property and coordinate assistance to victims and their family members impacted by major transportation disasters. The NTSB also conducts safety studies and prepares safety reports based on analyses of transportation accident and incident data to identify safety improvements or evaluate the worth of transportation-related devices or policy.

The enclosed budget submission reflects the President's request of \$105.2 million for fiscal year (FY) 2018. This level is equal to the FY 2016 enacted appropriation and is a \$0.2 million increase from the FY 2017 discretionary level. Despite planned operational efficiencies, at this funding level a decrease of 5 full-time equivalents (FTE) will be required as funding is insufficient to cover the cumulative effect of the enacted pay raise in 2017, the President's provisional pay raise effective January 2018, and non-pay inflation. This will bring the NTSB's FTE count to 418.

While we have always strategically invested in training, outreach, equipment and systems, the speed of development in emergent areas of transportation including commercial space, unmanned aircraft systems, high-speed rail, state of the art railroad technology and autonomous vehicles outpaces our ability to respond. Therefore, we are requesting a \$4.4 million dollar increase over our Budget Request to build our ability to fully understand and use Emerging Transportation Technologies to improve transportation safety. Detailed information on the specific use and benefits associated with this funding can be found in the "Emerging Transportation Technologies" tab of this submission. Without this investment, our continued ability to provide outstanding investigative services and analyses in any type of transportation related investigation may be diminished.

The NTSB's accomplishments are many, as we have documented in the enclosed budget submission. These include not only continuing our tradition of expert and independent investigations and recommendations, but also challenging ourselves to develop innovative approaches to communicating with all stakeholders in transportation safety including the traveling public. In addition, we are proud of our sound financial management and the resulting 14th consecutive unmodified (clean) audit opinion for the FY 2016 consolidated financial statements. Although our budget is small, adequate funding is essential to fulfill our mission both now and in the future.

Sincerely,



Robert L. Sumwalt, III  
Acting Chairman

Enclosure

cc: The Honorable Mario Diaz-Balart  
Chairman  
Subcommittee on Transportation, HUD, and Related Agencies  
Committee on Appropriations  
US House of Representatives

The Honorable David Price  
Ranking Democratic Member  
Subcommittee on Transportation, HUD, and Related Agencies  
Committee on Appropriations  
US House of Representatives

The Honorable Susan Collins  
Chairman  
Subcommittee on Transportation, HUD, and Related Agencies  
Committee on Appropriations  
US Senate

The Honorable Jack Reed  
Ranking Democratic Member  
Subcommittee on Transportation, HUD, and Related Agencies  
Committee on Appropriations  
US Senate

National Transportation Safety Board

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490 L'Enfant Plaza, SW  
Washington, DC 20594  
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## ACRONYMS AND ABBREVIATIONS

ADMS	Accident Data Management System
AS	NTSB Office of Aviation Safety
ASI	aviation safety investigator
AST	FAA Office of Commercial Space Transportation
ATB	articulated tug barge
ATC	air traffic control
BNSF	Burlington Northern Santa Fe Railway
CFO	NTSB Office of the Chief Financial Officer
<i>CFR</i>	<i>Code of Federal Regulations</i>
CIO	NTSB Office of the Chief Information Officer
CISO	Chief Information Security Officer
CP	control point
CSD	Computer Services Division
CSXT	CSX Transportation
CVR	cockpit voice recorder
DOT	US Department of Transportation
EAD	Enterprise Architect Division
EEO	Equal Employment Opportunity
EEODI	NTSB Office of Equal Employment Opportunity, Diversity and Inclusion
EMS	emergency medical services
EPR	engine pressure ratio
FAA	Federal Aviation Administration
FDR	flight data recorder

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FHWA	Federal Highway Administration
FISMA	Federal Information Security Management Act
FMCSA	Federal Motor Carrier Safety Administration
FOIA	Freedom of Information Act
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTE	full-time equivalent employment
FY	fiscal year
GA	general aviation
GAO	Government Accountability Office
GPS	global positioning system
GSA	General Services Administration
HELP	Highway Emergency Lane Patrol
HR	Human Resources
HS	NTSB Office of Highway Safety
ICAO	International Civil Aviation Organization
IFR	instrument flight rules
IIC	investigator-in-charge
IMC	instrument meteorological conditions
IMO	International Maritime Organization
IT	information technology
mm	mile marker
MS	NTSB Office of Marine Safety
MWL	Most Wanted List
NAS	national airspace system

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NASA	National Aeronautics and Space Administration
NHTSA	National Highway Traffic Safety Administration
nm	nautical mile
NTSB	National Transportation Safety Board
OMB	Office of Management and Budget
OPM	Office of Personnel Management
OSHA	Occupational Safety and Health Administration
OSHP	Occupational Safety and Health Program
PED	portable electronic device
PIREP	pilot weather report
PTC	positive train control
RE	NTSB Office of Research and Engineering
RMD	Records Management Division
ROCC	Rail Operations Control Center
RPH	NTSB Office of Railroad, Pipeline and Hazardous Materials
SES	US Air Force Safety Center Space Safety Division
SMS	safety management system
SRC	NTSB Office of Safety Recommendations and Communications
SSA	Safe Skies for Africa
SSD	Systems Support Division
sUAS	small unmanned aircraft system
SUV	sport utility vehicle
TDA	NTSB Transportation Disaster Assistance Division
TMS	Talent Management System
TPA	traffic pattern altitude



UAS	unmanned aircraft system
UK	United Kingdom
UP	Union Pacific Railroad
USAF	United States Air Force
U.S.C.	<i>United States Code</i>
USCG	United States Coast Guard
VFR	visual flight rules
VMC	visual meteorological conditions
VTS	vessel traffic service
WMATA	Washington Metropolitan Area Transit Authority

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## EXECUTIVE SUMMARY

The National Transportation Safety Board (NTSB) is an independent federal agency responsible for investigating and determining the probable cause of every civil aviation accident and significant accidents in other modes of transportation - railroad, highway, marine and pipeline. We develop and advocate recommendations to prevent future accidents or reduce their effects in terms of loss of life, injury, or damage to property and coordinate assistance to victims and their family members impacted by major transportation disasters. The NTSB conducts safety studies and prepares safety reports based on analyses of transportation accident and incident data to identify safety improvements or evaluate the worth of transportation-related devices or policy.

The enclosed budget submission reflects the President's request of \$105.2 million for fiscal year (FY) 2018. This level is equal to the FY 2016 enacted appropriation and is a \$0.2 million increase from the FY 2017 discretionary level. Despite planned operational efficiencies, at this funding level a decrease of 5 full-time equivalents (FTE) will be required as funding is insufficient to cover the cumulative effect of the enacted pay raise in 2017, the President's provisional pay raise effective January 2018, and non-pay inflation.

This report spotlights many of our major accomplishments in FY 2016. The Board adopted 63 products including major accident reports, briefs, safety recommendations, safety alerts, forums and special investigation reports. Across the modes, additional briefs were adopted by Office Directors under delegated authority. Our Office of Research and Engineering laboratories received over 600 recording devices and completed more than 500 readouts, transcripts, and studies in support of investigations in all modes.

One of the areas of focus in FY 2016 was the continuation of efforts to address the influence of developing technology both on the transportation industry and on the tools we use in the investigative process. Advances in transportation technologies are quickly changing the landscape of the transportation sector. NTSB must gain familiarity, increase technical knowledge and engage with industry leaders in the emergent technologies of commercial space, unmanned aircraft systems, high-speed rail, state of the art railroad technology, autonomous vehicles, database management systems, and analytics. This will prepare staff to investigate when this technology is a factor in an accident and facilitate smooth working relationships with all parties to investigations. NTSB equipment and analytical tools must keep pace with innovation to be at the forefront of mitigating, preventing and investigating transportation accidents.

While we have always strategically invested in training, outreach, equipment and systems, the speed of development in emergent areas outpaces our ability to respond. Therefore, we are requesting a \$4.4 million dollar increase over our Budget Request to build our ability to fully understand and use Emerging Transportation Technologies to improve transportation safety. Detailed information on the specific use and benefits associated with this funding can be found in the "Emerging Transportation Technologies" tab. Without this investment, our continued ability to provide outstanding investigative services and analyses in any type of transportation related investigation may be diminished.

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# EMERGING TRANSPORTATION TECHNOLOGIES

## CONGRESSIONAL JUSTIFICATION For Emerging Transportation Technologies Request Amount - \$4.4 million

### Overview of Request

Technological advances are transforming transportation products and services at an astonishing rate. These advances are a harbinger of dramatic improvements in transportation safety but also pose new challenges for manufacturers and operators of transportation conveyances and the traveling public. In particular, the ability of transportation operators to use new technologies safely and effectively has only recently become a subject of serious attention. Despite these concerns with the impact of new technologies on transportation safety, it is equally clear that these technologies provide dramatically improved tools for use in investigating the causes of transportation accidents.

Transportation technologies continue to advance, and it is critical that the National Transportation Safety Board (NTSB) remain aligned with changing trends. Recent innovation in the transportation industry, such as autonomous vehicles, commercial space transportation, hyper-speed rail, solar-powered planes, and new recording technologies make it increasingly important to remain up-to-date on emerging developments and techniques in mitigating, preventing, and investigating transportation accidents.

The NTSB strives to use the most advanced tools in analyzing transportation accidents and, over many years, has made a significant number of recommendations to regulators, manufacturers, and operators to develop and deploy new technologies to enhance safety and prevent future accidents. Yet, the pace of technological change and its complexity and sophistication present new challenges to NTSB investigators and analysts. In recent years, for example, we have investigated—and continue to investigate—commercial space launch accidents, lithium ion battery fires in aircraft and commercial vehicles, unmanned aircraft system (UAS) accidents, and semi-autonomous vehicle accidents. We also anticipate our future involvement in investigating high-speed rail accidents and accidents on systems subject to positive train control (PTC).

We recognize that our ability to continue to provide outstanding investigative services and analyses requires the availability of funds to acquire additional staff, develop staff expertise, and employ appropriate equipment and analytical tools to investigate those transportation accidents where the latest technologies may have contributed to accident causation.

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## A. Aviation Safety

### 1. Commercial Space Transportation

The Office of Aviation Safety's (AS) Commercial Space Transportation Program supports the agency's broader mission of improving transportation safety through accident and serious incident investigations, collaborative outreach and education on commercial space vehicles, and development of safety investigation techniques in commercial space as well as sharing those techniques with the international communities. The purpose of this funding is as follows:

- Develop the necessary investigative expertise in an emerging segment of transportation.
- Improve transportation safety through comprehensive and technically proficient commercial space accident and/or incident investigation.
- Develop and apply innovative and efficient investigative tools to be used during commercial space investigations to increase the timeliness of the investigations (less than 1 year) while maintaining their high quality.

Examples of activities include the following:

**Training for NTSB staff.** Specific activities will focus on two areas: (1) support of investigator proficiency through a broad portfolio of technical training and policy outreach activities and (2) NTSB participation as observers in commercial space mishap investigations led by an operator. These activities will enable staff to gain a better understanding of key commercial space organizations, become familiar with how different organizations create/develop their system safety analyses and/or hazard analyses, determine risk factors and reliability, and gain a better understanding of rocket motors and associated systems.

**Outreach with Commercial Space Stakeholders.** AS staff has established relations with numerous commercial space stakeholders including manufacturers and other groups (such as Orbital ATK, SpaceX, Scaled Composites, Virgin Galactic, United Launch Alliance, and Aerojet Rocketdyne). These key stakeholders need to become familiar with our agency and our investigative methodology. AS also needs to maintain close contact with the key government stakeholders in commercial space flight—the Federal Aviation Administration (FAA) Office of Commercial Space Transportation (AST), the National Aeronautics and Space Administration (NASA) Office of Safety and Mission Assurance, and the US Air Force (USAF) Safety Center Space Safety Division (SES). AS staff needs to participate in quarterly quad chair meetings (FAA, NASA, NTSB, and USAF) and attend twice-a-year SES Space Safety Council meetings. AS staff also needs to provide update briefings at Commercial Spaceflight Federation Board meetings. This funding will enable AS staff to maintain these crucial relationships in this emerging industry. In addition, staff from the NTSB's Office of Research and Engineering (RE) will need to develop expertise in

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analyzing vehicle performance and the data collection systems used by commercial space operators.

**Cost Estimate.** For Commercial Space Transportation, the NTSB requests \$0.6 million, consisting of \$0.2 million for training and travel expenses and \$0.4 million for two full-time equivalent employees (FTEs).

## 2. Unmanned Aircraft Systems

The purpose of this funding is to support AS's mission through investigating UAS accidents and serious incidents and maintaining investigator education and technical proficiency with an emerging segment of aviation. In addition, this funding will support effective and efficient investigations throughout the various transportation modes by developing staff capabilities to use the latest technology associated with UAS.

The high-level objectives for the AS's Unmanned Aircraft Systems Safety Program are as follows:

- Improve aviation safety through comprehensive and technically proficient UAS accident and incident investigation.
- Develop and apply innovative and efficient investigative tools using UAS and associated technologies to maintain the quality and timeliness of NTSB investigations.

As the number and complexity of UAS operations continues to grow, it is inevitable that the number of NTSB UAS investigations will also increase. AS must plan for increased demand on mission resources to cover this emerging segment of the industry. Currently, a cross-office informal collection of staff is available for various specialist-type issues regarding UAS, but specific mission resources will be required to maintain our high quality investigative standards. The plan for fiscal year (FY) 2018 will propose formalizing "Team UAS" to support building the knowledge base and conducting expert investigations. Examples of projects include the following:

**Training.** The agency will develop a comprehensive and organized plan for technical and procedural training for staff members who will participate in various facets of UAS investigations. Specialists must be available to support all aspects of UAS accident and incident investigation in a similar manner that we cover major investigations. Training will focus on specific technical areas including, but not limited to, air traffic procedures and technologies, vehicle performance, recorded data logging, battery technology, operational training, and maintenance.

**Outreach with Other Investigative Agencies and Industry Stakeholders.** As noted above, the personnel in various NTSB offices have initiated contacts and networked with other agencies and entities with experience or roles in accident and incident investigation. FAA, military, and international investigators, as well as experienced industry contacts, should be maintained and broadened to ensure that the NTSB is aware of best practices and

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techniques and lessons learned from other investigations. The International Civil Aviation Organization (ICAO) has established a Remotely Piloted Airplane Safety Working Group, and the plan for FY 2018 will support this effort. NTSB outreach in numerous conferences and with other government agencies will enable us to explain and clarify the NTSB's role and safety initiatives and provide stakeholder go-team training.

**Development of UAS as an Accident Investigation Tool.** The second pillar of the NTSB involvement in UAS is in harnessing the capabilities of UAS and associated technologies to support the agency's mission. NTSB investigative staff in all modes are motivated professionals always seeking the best, most efficient, and thorough methods to pursue the mission of conducting world-class accident investigations and have always kept their fingers on the pulse of the latest investigative techniques and technologies. UAS aerial imagery and other associated capabilities fall directly into this category. Funding for these activities will enhance the agency's organic investigative capabilities and facilitate the coordination of airspace issues with the FAA. In addition, beyond the versatility and cost-effective access that an unmanned vehicle itself offers, the accelerating development of payloads and processing for UAS imagery introduces virtually limitless possibilities for innovation of investigative techniques. (Although unrelated to this specific request, the agency is seeking specific legislative authority to acquire by purchase unmanned aircraft.)

**Cost Estimate.** For UAS, the agency's budget submission includes \$0.3 million, consisting of \$0.2 million for 1 FTE and \$0.1 million for travel, training, and procuring the necessary equipment. Responsibilities of the FTE would include leading and coordinating the development of projects; working with agencies to implement and monitor projects; coordinating cross-agency learning; problem-solving with state and local officials on ways to promote data-driven, innovative service delivery with existing resources; and guiding the incorporation of project learning into programs and policy.

## **B. Rail Safety**

### **1. High-Speed Rail**

The Office of Railroad, Pipeline and Hazardous Materials (RPH) is responsible for investigating railroad accidents involving passenger and freight railroads and commuter rail transit systems. These accidents typically involve collisions or derailments. In addition, staff provide expertise in signal and train control systems, mechanical equipment, track infrastructure, and operations. To ensure effective high-speed rail accident investigations, staff must develop expertise in emerging high-speed rail technologies. The purpose of this funding is as follows:

- Train/hire subject matter experts in high-speed rail transportation.
- Build expertise to support thorough high-speed rail accident/incident investigations.



- Expand outreach with manufacturers and state and federal government counterparts on international high-speed railroads and high-speed railroad equipment.

**Training.** High-speed rail is a mature technology having operated across Europe and Asia for decades. US railroads have begun the investment into high-speed corridors that will provide efficient high-speed passenger transportation. Technical training and hiring of experts with high-speed rail experience will be necessary to support accident investigations on high-speed corridors involving emerging technology in signal systems, equipment, and infrastructure. Participation and interaction between NTSB railroad investigators in foreign high-speed railroad investigations as observers will enable the NTSB to begin developing investigative staff to identify safety issues, build expertise in extracting and analyzing recorded data and vehicle performance, and develop safety recommendations to ensure passenger safety. Participation will also provide opportunities for investigative staff to learn how other countries regulate and conduct safety oversight of those complex high-speed railroad environments.

**Outreach.** Investigative staff often develop professional relationships domestically with railroad/transit officials, rail equipment manufacturers, and government officials to expand lessons learned from rail accident investigations to prevent similar accidents from occurring. Similarly, it is vital that investigative staff develop contacts internationally with high-speed rail industry representatives. Attendance and participation in high-speed rail conferences, seminars, and trade shows will allow investigators to seek out high-speed industry experts to support high-speed railroad accident investigations in the United States. Subject-matter experts in new high-speed rolling stock, tilt technology, crash energy management, alternative fuels, and new and innovative construction materials will be integral to NTSB accident investigations. Additionally, subject-matter experts with knowledge of computer automation and modeling, new communication systems, and advanced signal and train control systems will be required. The infrastructure to operate high-speed trains will also involve tighter tolerances and maintenance requirements; therefore, staff familiarization with maintenance practices of high-speed systems is necessary.

**Cost Estimate.** The NTSB requests \$0.52 million for training, travel expenses and two FTEs.

## 2. State-of-the-Art Railroad Technology

Funding for this area will ensure rail investigators build expertise and maintain technical proficiency that will potentially expedite phases of an investigation when confronted with new technology. Technical proficiency on emerging technology implemented throughout the railroad industry is vital to enable railroad investigators to conduct thorough rail investigations involving PTC systems, tilt train technologies, alternative fuel motive power, computer automation, and advanced communication systems. Research and knowledge of new investigative approaches will assure quick identification of safety issues, provide analytical skills, and ideas for safety

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recommendations from accident investigations. Through observation and training, the agency can assess if procuring and maintaining a locomotive simulator and track signal simulator or workstation would allow rail investigators to expedite testing and analysis necessary during an investigation without relying or burdening a railroad for the use of their facilities, thereby maintaining our independence. The purpose of this funding is as follows:

- Research the efficacy for NTSB to obtain both a locomotive and track signal simulator or advanced work station(s) and evaluate their potential to support the mission of rail accident/incident investigations involving advanced train control systems, advanced signal control technology, and other emerging railroad technology by using the simulators or work station(s) to analyze collected accident data from emerging technologies when determining probable cause and potential safety recommendations.
- Research the types of data that will be available once these emerging technologies are fully deployed in the United States.
- Have the potential to expedite all phases of a rail investigation by affording rail investigators access to a locomotive simulator and a track signal and switch simulator.

**Advanced Train Control Systems.** US railroads have been mandated to implement PTC systems on certain rail corridors across the country. The system will be comprised of back-office technology, wayside technology, and locomotive technology. All three systems, coupled with advanced communications, contain advanced hardware and software. Technical training for railroad investigators to enable investigation of these advanced train control systems, train equipment, and computer automation systems is necessary to support future accident investigations. Further participation and interaction between NTSB railroad investigators with railroad equipment manufacturers and railroad technical training divisions will provide the agency with information necessary to make a determination related to the efficacy of owning and maintaining in house simulators. Investigative staff will research the functionality of these emerging rail systems, the interoperability designs required by current regulations, maintenance practices that railroads employ to maintain these complex systems, and, more importantly, the data repositories available to investigators during investigations. With this collected data, NTSB staff will be adept at applying methodologies necessary to examine accident details in greater depth and identifying preventable measures to mitigate future occurrences. The cost estimates below include the education and research elements of this proposed effort.

**Cost Estimate.** The NTSB requests \$0.134 million for research of advanced train control systems in support of acquiring a locomotive and track signal simulator or advanced work station(s).

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## C. Highway Safety

**Autonomous Vehicles.** Driverless cars are coming, and their potential for improving highway safety is promising. First and foremost, driverless cars will substantially affect the 35,000 lives that are lost every year on our streets and highways. Driverless cars could also increase the amount of traffic that our roads can safely carry because the precision of vehicle separation can be reduced to improve infrastructure capacity. Most crashes on our roads are due to driver error. The theory of driverless cars is that if there is no driver, there will be no driver error. Decades of experience in a variety of contexts has demonstrated that automation can improve safety, reliability, productivity, and efficiency. That experience has also demonstrated that there can be a downside. The first potential downside is that the theory of removing human error by removing the human assumes that the automation is working as designed. The question is, what if the automation fails? Will it fail in a way that is safe? If it cannot be guaranteed to fail safe, will the operator be aware of the failure in a timely manner, and will the operator then be able to take over to avoid a crash? The second potential downside is that even if the operator is removed from the loop, humans are still involved in designing, manufacturing, and maintaining the vehicles, as well as the streets and highways that they use. Each of these points of human engagement presents opportunities for human error. Moreover, human error in these steps is likely to be difficult to find and correct.

The purpose of this funding is as follows:

- Improve transportation safety through comprehensive and technically proficient automated vehicle crash and/or incident investigation. Cars today contain a host of vehicle electronics, many of which are relevant to crash investigations. The future of vehicle crash investigations will entail even more electronic systems using a variety of technologies: differential global positioning system (GPS), Lidar, radar, machine learning of camera imaging, and fleet learning. These components in vehicle control systems must be understood to investigate automated vehicle crashes. Crash reconstruction techniques are also evolving based on data available to document the movement and control of vehicles (for example, three-dimensional GPS layers of position data).
- Develop staff and staffing for the complexity of automated vehicles. Staff capabilities, both in the Office of Highway Safety (HS) and in the RE need a recorder specialist and systems engineer with expertise to work with automated vehicle command and control systems. The ability to handle large data sets and an understanding of forensic data techniques, for example, and the ability to crosscheck the event timing of data among different vehicle network systems will be required. Based on sensor type and processing algorithms, a wide range of data formats will need to be understood in order to analyze command and control of the vehicle.
- Develop technical capabilities to analyze systems data collected from automated vehicles. The current state of automotive engineering is a very

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competitive environment, and we anticipate experiencing a range of car manufacturers' responsiveness to engage as party members in NTSB investigations. Although there are no safety standards that dictate a common set of system functionality, as such, each vehicle type involved in an investigation will have its own unique systems. Our standard methods for downloading event data recorders are not applicable to automated vehicle crashes. To the extent that we can reverse engineer an understanding of the data that we do encounter with progressively more cases, we need to develop an independent capability to simulate the automated systems' role in the crash sequence.

**Cost Estimate.** The NTSB requests \$0.6 million in FY 2018, which includes \$0.2 million for training and travel expenses and \$0.4 million for two FTEs. The real need in future budget terms is human capital with the right expertise. To the extent possible, we will develop that expertise in existing staff through training and industry experience.

#### **D. Multi-Modal Accident Database Management System**

The purpose of this funding is to support NTSB investigative offices' ability to maintain a historical record of the accidents that it investigates. The NTSB maintains an aviation Accident Data Management System (ADMS) for the storage, retrieval, and management of information associated with its aviation accident/incident investigations. Aviation safety investigators use the ADMS to start a new case record for each investigation and subsequently manage that case through various report development milestones until the release of a final report. Staff relies on data from the aviation ADMS to monitor workflow, conduct safety research, support accident investigations, produce annual statistical reviews, and respond to Congressional requests. These data are also used to fulfill the United States' reporting requirements to the ICAO, government agencies, and industry organizations; individuals also regularly use the data for safety research.

The NTSB has identified a need, based, in part, on the demonstrated value of the aviation ADMS, to develop multiple ADMS variants for the other transportation modes. The requirement will involve, through evaluation of modal office needs, development of ADMS variants suitable for each modal office and subsequent ongoing maintenance of those systems. To limit development and maintenance costs and maximize the availability of shared data across modes, the newly developed ADMS variants will use the existing aviation ADMS framework.

The high-level objectives for the Multi-Modal Program ADMS are as follows:

- Improve the quality of accident data available to the public.
- Develop state-of-the-art transportation accident databases for each of the three other modal investigative offices to improve accident selection and allocation of limited resources.

- Improve the user interface of the current ADMS and thereby reduce staff time entering data; this improves accuracy, thereby improving the effectiveness of safety efforts based upon the data.

**Task Areas:**

The NTSB has been using the aviation ADMS since 2008. Through daily use of the system, in addition to completion of a product requirements document, NTSB staff has identified several new system features and enhancements aimed at improving the efficiency and quality of data entry, analysis, and presentation.

Tasks will include items in the following areas:

- Evaluation of modal office data collection and reporting requirements.
- Development of new modal ADMS variants based on the needs established in the data collection and reporting requirements task and the existing ADMS framework.
- Ongoing maintenance of the existing aviation ADMS, as well as the newly developed ADMS in other modes.
- Enhancements to both the existing and newly developed ADMS software for all modes, as identified.

**Cost Estimate.** For the Multi-Modal ADMS development, the agency’s budget request includes \$1.2 million (which includes \$0.2 million for 1 FTE). Responsibilities of the FTE would include leading and coordinating the development of the project; working with modal offices to improve the product and ensure that the product meets the modal offices’ needs; and coordinating modal office staff learning of the program.

**E. Data Analytics**

The NTSB’s ADMS is an electronic database containing the factual and analytical details of all aviation accidents and incidents investigated by the agency. NTSB investigators and analysts use this database, along with external information sources, in support of aviation investigations, safety recommendations, outreach, and fulfilling the NTSB’s responsibility to “conduct special studies on matters pertaining to safety in transportation and the prevention of accidents.” The purpose of this funding is to expand the NTSB’s capabilities for analyzing safety data beyond individual investigations and to use data analytics to improve the efficiency of investigations and efficacy of safety improvement activities.

FAA aviation safety oversight has been evolving over several years away from strict regulatory enforcement to support voluntary compliance policy and full-scale implementation of safety management systems (SMS) in air carrier, airport, and manufacturing operations. Expanded data analytics capabilities will allow the NTSB to

make better use of SMS and operational data for investigations and studies and strategically align NTSB safety efforts with those of the industry and the FAA, where appropriate.

**Task Areas:**

AS is leading an effort, along with staff from RE and the Office of the Chief Information Officer (CIO), using data analytics to identify improvements in the NTSB strategic use of safety data sources and visualization techniques to improve the following:

- Investigation and remediation of the highest consequence safety issues contributing to accidents that are most relevant for the aviation industry.
- Proactive identification of trends and emerging aviation safety risks in both airline and general aviation (GA) operations.

Staff will analyze aviation safety-related data from both internal and external sources to identify emerging areas of transportation safety risk and strategically examine issue areas for enhanced evidence documentation, realistic scoping of safety recommendations and safety alerts, and effectiveness of our products and outreach and advocacy initiatives. Improved data analytics will drive decision-making for investigation launch criteria, training priorities for staff, and outreach efforts and will provide data to support inquiries and safety initiatives from the transportation industry, Congress, and the public.

This effort compliments the NTSB Multi-Modal ADMS development, and, once established by AS, the data analytics effort could expand to include the other NTSB modal offices.

**Cost Estimate.** The NTSB requests \$1.0 million for this effort, which includes software, configuration, training, and \$0.6 million for 3 FTE. Responsibilities of the FTEs would include leading and coordinating the development of the project and working with industry and government sources to analyze and share safety data.



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## MISSION AND ORGANIZATION OVERVIEW

Since its creation in 1967 as an accident investigation agency within the newly created US Department of Transportation (DOT), the NTSB's mission has been to determine the probable cause of transportation accidents and incidents and to formulate safety recommendations to improve transportation safety. Our authority currently extends to the following types of accidents:

- All US civil aviation accidents and certain public aircraft accidents.
- Select highway accidents.
- Railroad accidents involving passenger trains or select freight train accidents that result in fatalities or significant property damage.
- Major marine accidents and any marine accident involving both a public and a nonpublic vessel.
- Pipeline accidents involving fatalities, substantial property damage, or significant environmental damage.
- Select accidents resulting in the release of hazardous materials in any mode of transportation.
- Select transportation accidents that involve problems of a recurring nature or that are catastrophic.

In 1974, Congress passed the Independent Safety Board Act, which severed the NTSB's ties to the DOT and authorized the agency to take the following additional actions:

- Evaluate the effectiveness of government agencies involved in transportation safety.
- Evaluate the safeguards used in the transportation of hazardous materials.
- Evaluate the effectiveness of emergency responses to hazardous material accidents.
- Conduct special studies on safety problems.
- Maintain an official US census of aviation accidents and incidents.
- Review appeals from individuals and entities who have been assessed civil penalties by the FAA.
- Review appeals from airmen and merchant seamen whose certificates have been revoked or suspended by the FAA and the US Coast Guard (USCG), respectively.

The NTSB also leads US teams assisting in foreign airline accident investigations conducted by foreign authorities under the provisions of International Civil Aviation Organization (ICAO) agreements. In 1996, the Aviation Disaster Family Assistance Act

further assigned us the responsibility of coordinating federal government resources and other organizations to support local, state, and airline efforts to assist aviation disaster victims and their families after accidents in which there is a major loss of life. A subsequent presidential memorandum directed federal agencies to support our agency when we assume the same responsibilities for major surface transportation accidents. The rail passenger disaster family assistance provisions of the Rail Safety Improvement Act of 2008 assigned us similar responsibilities for rail passenger disasters resulting in a major loss of life, regardless of the cause or suspected cause.

To date, the NTSB has investigated more than 144,000 aviation accidents and thousands of surface transportation accidents. On call 24 hours a day, 365 days a year, our investigators have traveled throughout the United States and to every corner of the world to perform investigations. Because of this dedication, we are recognized as the world's leading accident investigation agency.

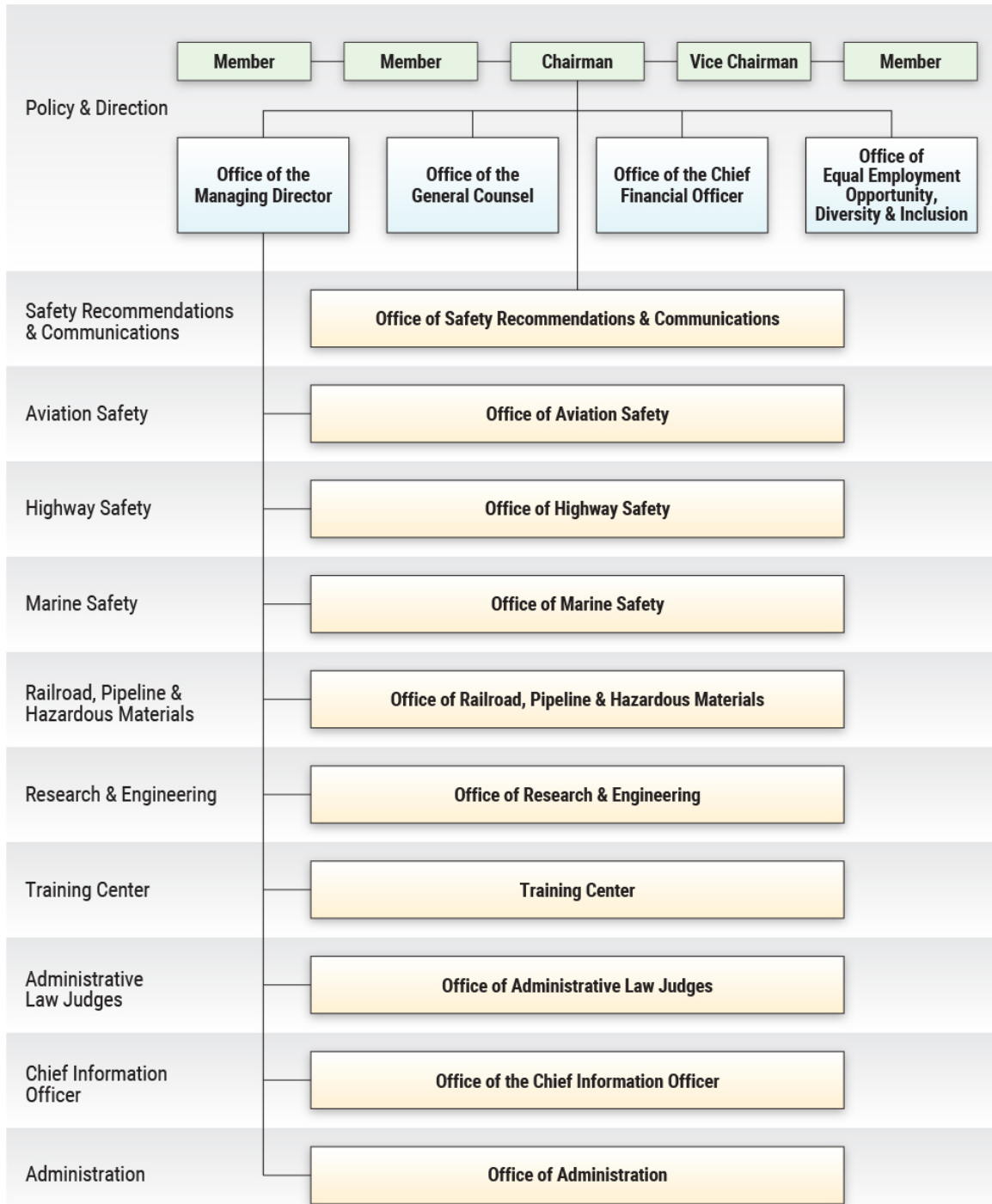
We have issued more than 14,400 safety recommendations to more than 2,300 recipients in all transportation modes as a result of NTSB investigations. Since 1990, we have published the Most Wanted List (MWL) of Transportation Safety Improvements, which highlights safety-critical actions that the DOT modal administrations, the USCG, the states, and other entities should take to help prevent accidents and save lives. Further information concerning the MWL appears in Appendix A.

We are not authorized to regulate transportation equipment, personnel, or operations or to initiate enforcement action. However, because of our reputation for objectivity and thoroughness, we have achieved such success in shaping transportation safety improvements that, over the last 5 years, those who are in a position to affect these changes have implemented more than 71 percent of the agency's recommendations. Many safety features currently incorporated into airplanes, helicopters, automobiles, commercial motor vehicles, trains, pipelines, and marine vessels had their genesis in NTSB safety recommendations. Further information concerning the status of our safety recommendations appears in Appendix B.

The five-member Board is composed of appointees nominated by the President and confirmed by the Senate. A Chairman (who is nominated by the President and subject to Senate confirmation) serves as the chief executive officer of the NTSB. The President also designates one of the Members as Vice Chairman.

The NTSB is headquartered in Washington, DC. We also have investigators located in offices in Ashburn, Virginia; Denver, Colorado; Anchorage, Alaska; and Federal Way, Washington as well investigators throughout the country who telework. The NTSB's training center is located in Ashburn, Virginia.

*National Transportation Safety Board Organization and Program Structure*



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## RESOURCE REQUIREMENTS

### Appropriation Language

#### *Salaries and Expenses - 950310*

“For necessary expenses of the National Transportation Safety Board, including hire of passenger motor vehicles and aircraft; services as authorized by 5 U.S.C. [*United States Code*] 3109, but at rates for individuals not to exceed the per diem rate equivalent to the rate for a GS-15; uniforms or allowances therefore, as authorized by law (5 U.S.C. 5901-5902), \$105,170,000 of which not to exceed \$2,000 may be used for official reception and representation expenses. The amounts made available to the National Transportation Safety Board in this Act include amounts necessary to make lease payments on an obligation incurred in FY 2001 for a capital lease.”

#### *Emergency Fund - 950311*

The Administration is not requesting new funding for the Emergency Fund for FY 2018.

## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

### Program and Financing Schedule (\$000s)

Identification Code: 95-0310-0-1-407	FY 2016	FY 2017	FY 2018
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**Obligations by Program Activity:**

0001 Policy and Direction	12,522	12,684	14,204
0002 Safety Recommendations and Communications	7,794	8,695	8,359
0003 Aviation Safety	30,700	31,959	31,706
0004 Information Technology and Services	8,070	6,432	6,067
0005 Research and Engineering	11,173	11,483	11,626
0006 Training Center	890	936	949
0007 Administrative Law Judges	1,957	2,049	2,075
0008 Highway Safety	7,216	7,471	7,568
0009 Marine Safety	7,559	4,897	4,962
0010 Railroad, Pipeline, and Hazardous Materials	8,541	9,154	9,052
0011 Administrative Support Services	8,203	9,159	8,602
0091 Direct Program Activities, Subtotal	104,625	104,919	105,170
0100 Sub-Total Direct Obligations	104,625	104,919	105,170
0806 Training Center	644	1,000	1,000
0811 Subleases	594	0	0
0899 Total reimbursable obligations	1,238	1,000	1,000
0900 Total New Obligations	105,863	105,919	106,170

**Budgetary Resources:**

1000 Unobligated balance brought forward, Oct 1	6,011	6,621	6,621
1050 Unobligated balance(total)	6,011	6,621	6,621
Budget Authority:			
1100 Appropriation, discretionary	105,170	104,919	105,170
1160 Appropriation (total discretionary)	105,170	104,919	105,170
1700 Spending authority from offsetting collections	1,687	1,000	1,000
1750 Spending auth. from offsetting collections,dis (total)	1,826	1,000	1,000
1900 Budget authority (total)	106,996	105,919	106,170
1930 Total budgetary resources available	113,007	112,540	112,791

**Memorandum (non-add) entries:**

1940 Unobligated balance expiring	-987	0	0
1941 Unexpired unobligated balance, end of year	6,011	6,621	6,621

Identification Code: 95-0310-0-1-407		FY 2016	FY 2017	FY 2018
<b><u>Change in Obligated Balance:</u></b>				
3000	Unpaid obligations, brought forward Oct 1 (gross)	18,985	18,121	21,121
3010	Obligations incurred, unexpired accounts	105,863	105,919	106,170
3011	Obligations incurred, expired accounts	657	0	0
3020	Obligated balance, Outlay (gross)	-105,894	-102,919	-106,170
3041	Recoveries of prior year unpaid obligations, expired	-1,490		
3050	Unpaid obligations, end of year	18,274	18,121	21,121
3100	Obligated balance, start of year (net)	18,985	18,121	21,121
3200	Obligated balance, end of year	18,121	21,121	21,121
<b><u>Budget Authority and Outlays, Net:</u></b>				
Discretionary:				
4000	Budget authority, gross	106,996	105,919	106,170
Outlays, gross:				
4010	Outlays from new discretionary authority	91,452	84,984	85,188
4011	Outlays from discretionary balances	14,442	17,935	20,982
4020	Outlays, gross (total)	105,894	102,919	106,170
Offsetting Collections Against Gross Budget Authority and Outlays:				
4030	Federal Sources	-1,249	-530	-530
4033	Nonfederal Sources	-456	-470	-470
4040	Total Offsetting Collections	-1,705	-1,000	-1,000
4080	Outlays, net (discretionary)	104,189	101,919	105,170
4180	Budget authority	105,170	104,919	105,170
4190	Outlays, net (total)	104,189	101,919	105,170



## EMERGENCY FUND

### Program and Financing Schedule (\$000s)

<b>Identification Code:</b> 95-0311-0-1-407	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
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**Budgetary Resources:**

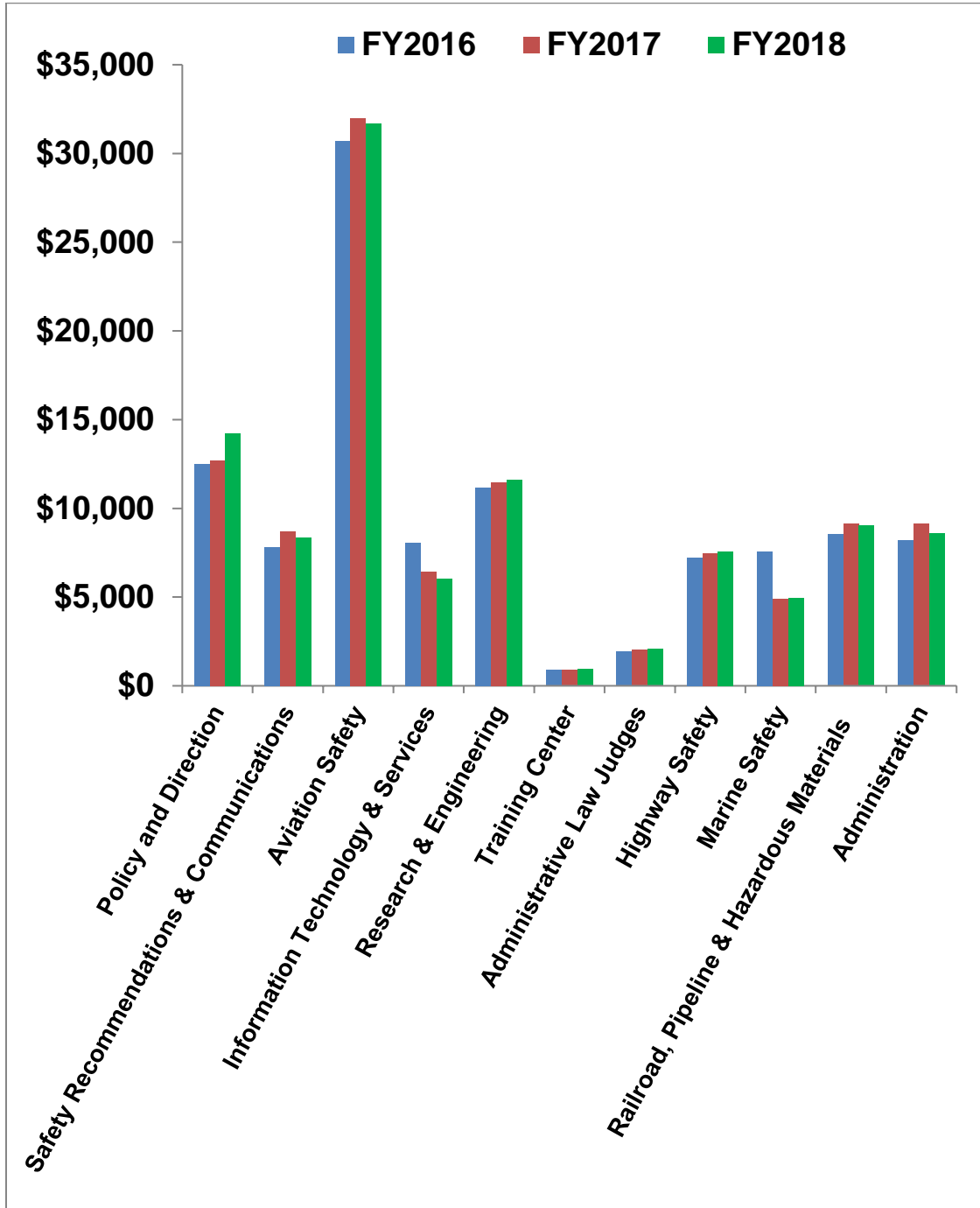
Unobligated balance:			
1000	Unobligated balance brought forward, Oct 1	1,998	1,998
1930	Total budgetary resources available	1,998	1,998

**Memorandum (non-add) entries:**

1941	Unexpired unobligated balance, end of year	1,998	1,998
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## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

Obligations by Program Activity (\$000s)



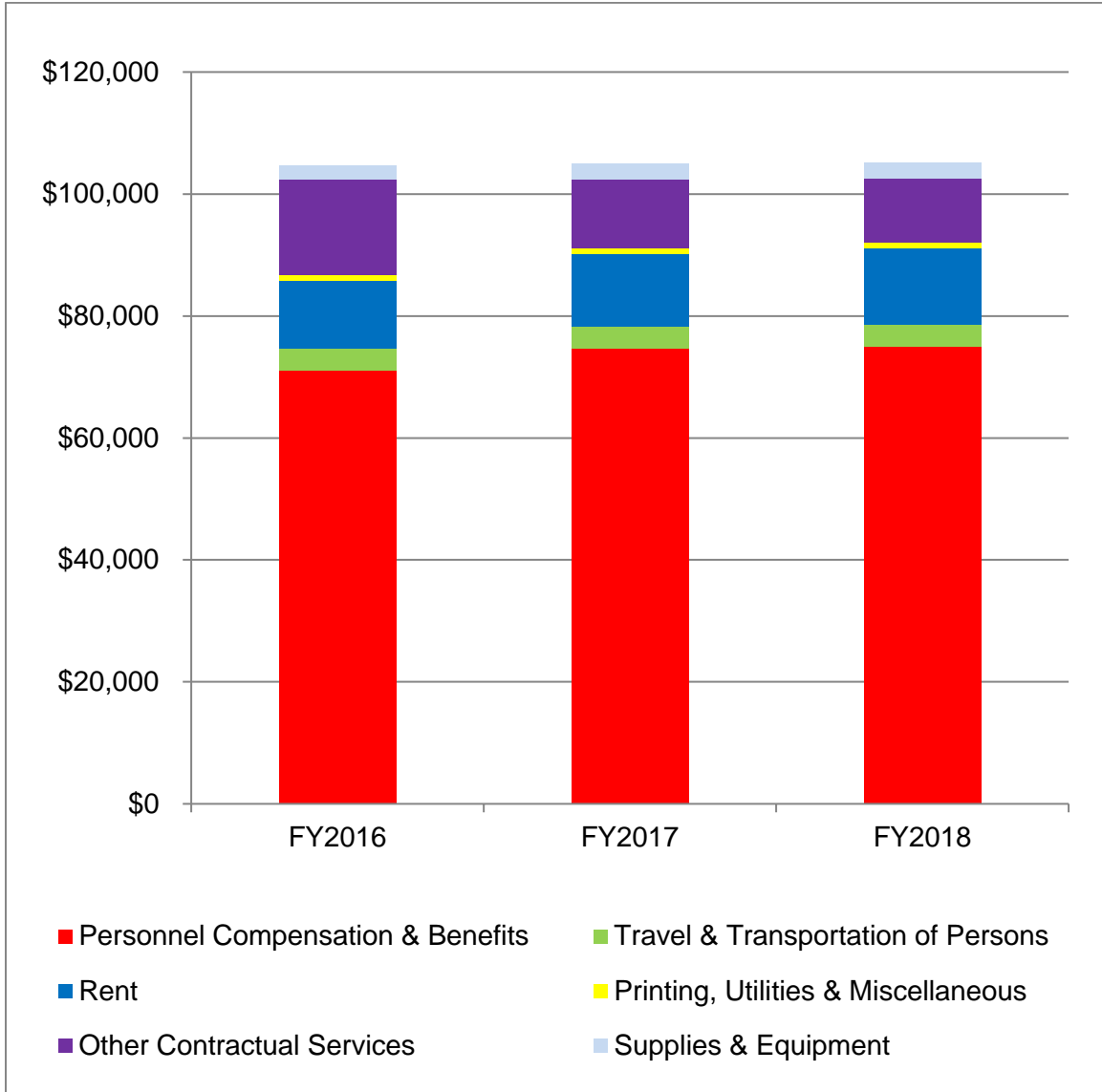
## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

### Obligations by Program Activity (\$000s)

Identification Code: 95-0310-0-1-407	FY 2016	FY 2017	FY 2018
Policy and Direction	12,522	12,684	14,204
Safety Recommendations and Communications	7,794	8,695	8,359
Aviation Safety	30,700	31,959	31,706
Information Technology and Services	8,070	6,432	6,067
Research and Engineering	11,173	11,483	11,626
Training Center	890	936	949
Administrative Law Judges	1,957	2,049	2,075
Highway Safety	7,216	7,471	7,568
Marine Safety	7,559	4,897	4,962
Railroad, Pipeline and Hazardous Materials	8,541	9,154	9,052
Administration	8,203	9,159	8,602
<b>Total</b>	<b>104,625</b>	<b>104,919</b>	<b>105,170</b>

## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

Obligations by Object Classification (\$000s)



## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

### Obligations by Object Classification (\$000s)

<b>Identification Code:</b>	<b>95-0310-0-1-407</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
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**Personnel Compensation and Benefits:**

11.1	Permanent Positions	49,500	51,083	51,038
11.3	Positions Other Than Permanent	2,544	2,730	3,172
11.5	Other Personnel Compensation	1,976	2,957	2,906
	<b>Total Personnel Compensation</b>	<b>54,020</b>	<b>56,770</b>	<b>57,116</b>
12.1	Personnel Benefits	17,064	17,900	17,896
	<b>Subtotal, Personnel Compensation and Benefits</b>	<b>71,085</b>	<b>74,670</b>	<b>75,012</b>

**Other Than Personnel Compensation and Benefits**

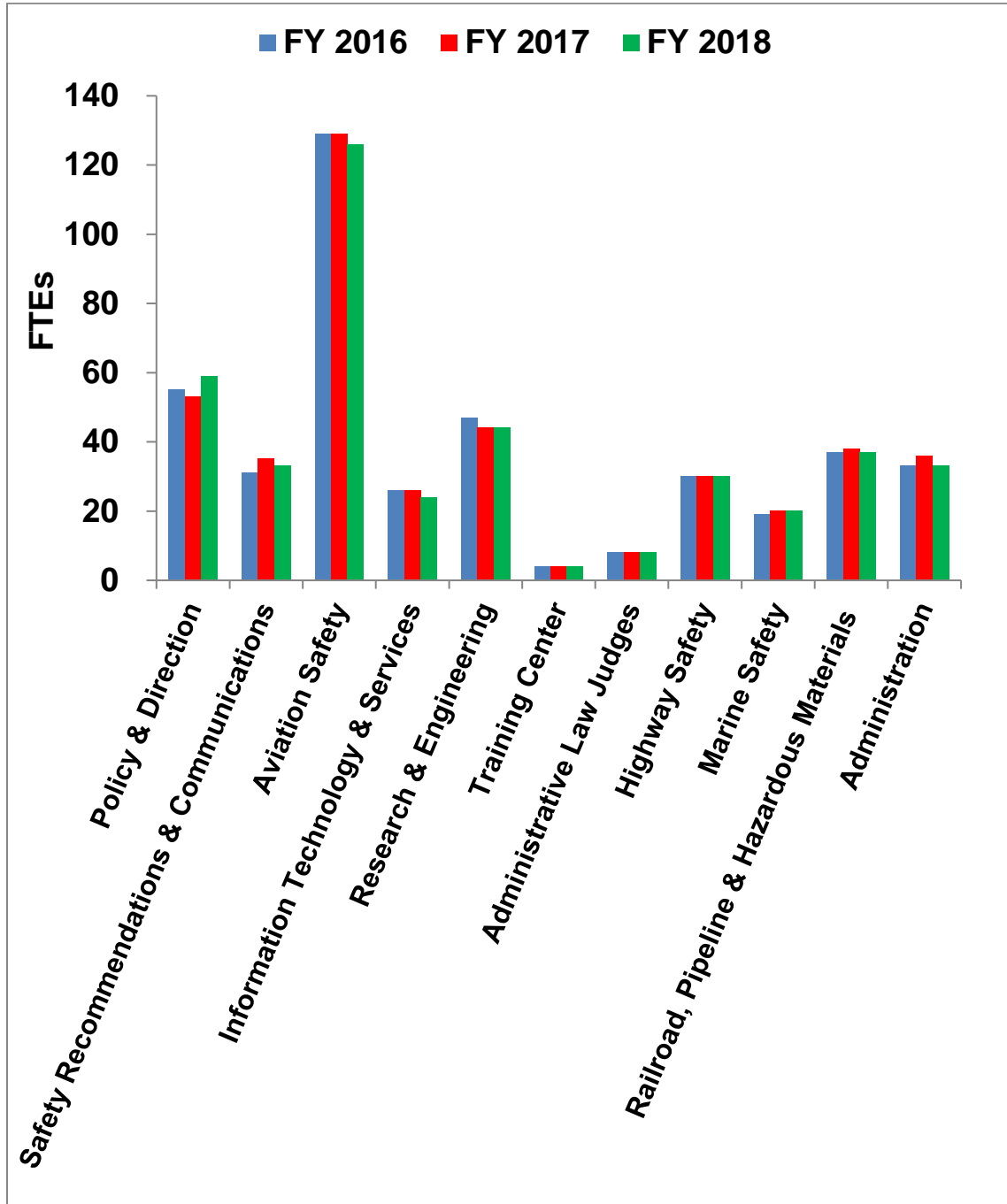
21.0	Travel and Transportation of Persons	3,472	3,462	3,535
22.0	Transportation of Things	68	70	70
23.1	Rental Payments to GSA	8,991	9,206	9,646
23.2	Rental Payments to Others	2,191	2,832	2,886
23.3	Communications, Utilities, and Miscellaneous Charges	848	872	879
24.0	Printing and Reproduction	109	112	113
25.0	Other Contractual Services	15,693	11,107	10,416
26.0	Supplies and Materials	551	566	571
31.0	Equipment	1,617	2,022	2,042
<b>99.9</b>	<b>Total Obligations</b>	<b>104,625</b>	<b>104,919</b>	<b>105,170</b>

**Personnel Summary:**

	Full-time equivalent (FTE) employment	419	423	418
-	Permanent	414	418	413
-	Other Than Permanent	5	5	5

## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

Staffing by Program Activity





## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

### Staffing by Program Activity

Identification Code: 95-0310-0-1-407	FY 2016	FY 2017	FY 2018
<b>Policy and Direction</b>	<u>55</u>	<u>53</u>	<u>59</u>
Chairman, Vice Chairman, Board Members	12	13	15
Office of the Managing Director	17	15	16
Office of the General Counsel	11	10	10
Office of the Chief Financial Officer	12	12	15
Office of EEO, Diversity and Inclusion	3	3	3
<b>Safety Recommendations and Communications</b>	31	35	33
<b>Aviation Safety</b>	129	129	126
<b>Information Technology and Services</b>	26	26	24
<b>Research and Engineering</b>	47	44	44
<b>Training Center</b>	4	4	4
<b>Administrative Law Judges</b>	8	8	8
<b>Highway Safety</b>	30	30	30
<b>Marine Safety</b>	19	20	20
<b>Railroad, Pipeline and Hazardous Materials</b>	37	38	37
<b>Administration</b>	33	36	33
<b>Total</b>	419	423	418

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## NATIONAL TRANSPORTATION SAFETY BOARD SALARIES AND EXPENSES

### Analysis of Changes - FY 2017 to FY 2018

\$ (1,107) Staff Increase/Decrease

A reduction in staff of 5 FTEs will be required to meet a funding level of \$105,170,000.

\$ 1,235 Pay Raise

Funds cover the annualized costs of the President's 1.9 percent provisional pay raise effective January 2018.

\$ 364 Non-pay Inflation

Inflation of 2.0 percent is used for non-pay costs based on economic assumptions for discretionary programs.

\$ (241) Other

The requested funds cover increases in rent for General Services Administration (GSA) and non-GSA occupancy agreements and increases in shared services offset by operational efficiencies.

\$ 251 Total

### Summary of Changes

\$ 104,919 FY 2017 level (423 FTEs)

\$ 251 Total Increase

\$ 105,170 FY 2018 level (418 FTEs)

## POLICY AND DIRECTION

<b>Policy and Direction</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$12,684	53
FY 2018 Request	\$14,204	59
Increase/Decrease	\$1,520	6

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. An increase in staff of 6 FTEs includes bringing the Board to full staffing. No other program changes are planned.

### Program Description

Policy and Direction program resources fund the offices of the Chairman, Vice Chairman, and Members of the Board, as well as the Offices of the Managing Director, General Counsel, Chief Financial Officer, and Equal Employment Opportunity, Diversity, and Inclusion. Collectively, these offices provide overall leadership, management, and direction for the NTSB.

#### *Chairman, Vice Chairman, and Board Members*

The Chairman serves as the chief executive officer for the agency. The Chairman, Vice Chairman, and Board Members preside at NTSB Board meetings; review and approve all NTSB reports, safety studies, and safety recommendations; provide appellate review of FAA certificate and certain civil penalty actions, as well as USCG license actions; and act as spokespersons at accident scenes. They also advocate safety recommendations with the transportation community, federal agencies, state and local governments, and the public.

#### *Office of the Managing Director*

The Office of the Managing Director assists the Chairman in the discharge of executive and administrative functions. The office coordinates activities of the entire staff, manages the day-to-day operation of the agency, and develops and recommends plans to achieve program objectives. The Managing Director is responsible for the overall leadership, direction, and performance of the agency, as well as its communications and organizational efficiency, including oversight of the NTSB Response Operations Center. The center provides support 24 hours a day, 365 days a year, for agency-wide operational requirements, including accident launches and the collection and dissemination of information related to transportation accidents and incidents.

Additionally, two organizational units reside within the Office of the Managing Director. The Training Center manages workforce development and external training

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functions. The Executive Secretariat is responsible for the processing and archiving of external correspondence.

### ***Office of the General Counsel***

The Office of the General Counsel provides advice and assistance on legal aspects of policy matters, legislation, testimony, NTSB rules, and ethics. The office also provides timely and objective review of airman appeals of certificate actions and certain civil penalties and seaman license actions, acting on behalf of the NTSB on particular procedural aspects of enforcement cases; makes decisions as to the release of official information pursuant to the requests or demands of private litigants, courts, or other authorities for use in litigation not involving the United States; ensures compliance with statutes concerning public access to information through publication of NTSB decisions and releases under the Freedom of Information Act (FOIA); provides counsel and staff assistance to the US Department of Justice when the NTSB is a party to judicial proceedings; and provides internal legal assistance and guidance regarding accident and incident investigations, hearings, appearances as witnesses, acquiring evidence by subpoena and other means, and the taking of depositions.

### ***Office of the Chief Financial Officer***

The Office of the Chief Financial Officer (CFO) manages NTSB financial resources, develops the agency's budget requests for submission to the Office of Management and Budget (OMB) and Congress, and executes the budget for resources appropriated to the NTSB by Congress. The CFO also prepares the agency's financial statements, as required by the Accountability of Tax Dollars Act; oversees property and inventory control programs; and analyzes the fee structure for services that the agency provides on a reimbursable basis. Additionally, the CFO is responsible for ensuring compliance with the Federal Managers' Financial Integrity Act.

### ***Office of Equal Employment Opportunity, Diversity and Inclusion***

The Office of Equal Employment Opportunity, Diversity and Inclusion (EEODI) advises and assists the Chairman and NTSB office directors in carrying out their responsibilities relative to Title VII of the Civil Rights Act of 1964, as amended, and other laws, executive orders, and regulatory guidelines affecting diversity development and the processing of Equal Employment Opportunity (EEO) complaints. These services are provided to managers, employees, and job applicants by the director and two full-time staff, three collateral-duty employees (one Hispanic employment program manager, one federal women's program manager, and one disability program manager), and volunteer special emphasis program managers. To maintain the integrity and impartiality of the agency's EEO complaints resolution program, external EEO counselors and investigators are contracted to help employees and job applicants who file formal or informal complaints of alleged discrimination. In addition, the office manages an alternative dispute resolution program. EEODI services also include providing required educational training to NTSB

staff, raising diversity awareness at the agency, engaging in targeted outreach, helping with internal recruitment initiatives, and providing career enhancement advisory services.

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## SAFETY RECOMMENDATIONS AND COMMUNICATIONS

<b>Safety Recommendations and Communications</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$8,695	35
FY 2018 Request	\$8,359	33
Increase/Decrease	(\$336)	(2)

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. A reduction in staff of 2 FTEs is required to meet the FY 2018 request level. No other program changes are planned.

### Program Description

The Office of Safety Recommendations and Communications (SRC) comprises six divisions: Safety Advocacy, Safety Recommendations, Media Relations, Government and Industry Affairs, Transportation Disaster Assistance (TDA), and Digital Services. SRC ensures information regarding NTSB investigations, activities, advocacy, and safety recommendations is accurately and effectively communicated to a range of stakeholders, including elected officials and their staff at the federal, state, and local levels; industry representatives; media; victims of transportation accidents and their families; and the public. SRC's mission begins at the scene of an accident, continues through NTSB safety investigations and recommendation issuance, and is maintained through advocacy efforts to secure favorable action on safety recommendations that are not yet implemented. In addition to using traditional communication methods, the office also uses digital and social media to facilitate robust public and stakeholder engagement.

### *Safety Advocacy Division*

The Safety Advocacy Division is responsible for the following:

- Developing and administering the NTSB Most Wanted List (MWL) based, in part, on open safety recommendations. The MWL is the agency's preeminent advocacy tool and highlights issues whose resolution would significantly impact transportation safety at the national and state levels. A new list is announced biennially at a press conference. Although the NTSB actively advocates for the acceptance of all its safety recommendations, follow-up efforts are generally more aggressive for the recommendations supporting MWL issues.

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- Developing the MWL advocacy strategy and working with Board Members and NTSB staff to promote MWL issues.
  - Developing and implementing the agency’s advocacy program to highlight state-related safety recommendations.
  - Collaborating with the Government and Industry Affairs Division to obtain support for programs and legislation at state and local levels consistent with agency recommendations.
  - Disseminating safety information and increasing public awareness of NTSB activities in transportation safety through the “Safety Compass” blog, other social media venues, and conference presentations.
  - Developing and maintaining contact with safety advocacy organizations and providing information on NTSB activities and safety recommendations.

### ***Safety Recommendations Division***

The Safety Recommendations Division is responsible for the following:

- Working with modal offices to develop draft safety recommendations that are actionable, effective, and measurable.
- Supporting and tracking safety recommendation implementation.
- Reviewing responses from safety recommendation recipients and drafting classification response letters for Board Member review and approval.
- Maintaining the safety recommendation database, which includes information on recommendation recipients, status, adoption, and implementation.
- Analyzing safety recommendation status and implementation and generating summary reports.

### ***Media Relations Division***

The Media Relations Division is responsible for the following:

- Serving as national spokespeople for the NTSB.
- Serving as the primary point of contact for all media activity and disseminating information about NTSB activities to the public. This includes collaborating with other SRC divisions to ensure the integrated, coordinated, and synchronized release of information including imagery, media relations products such as news releases and feature releases, and social media content to build public support of the NTSB’s mission, initiatives, and campaigns.
- Providing media relations support for Board Members and investigators, including developing key messages, supporting talking points, facilitating interviews, and conducting media training. Proactively identifying

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opportunities to engage the media to communicate key messages to identified audiences.

- Providing input to senior leadership regarding public and media perceptions of NTSB actions and policies and creating and maintaining a library of public affairs guidance for issues of media interest to align messaging and promote unity of effort within the agency.
- Providing strategic and tactical media-relations support for forums, meetings, roundtables, and other special investigative events.

### *Government and Industry Affairs Division*

The Government and Industry Affairs Division serves as the principal point of contact for government entities regarding the NTSB mission and supports outreach to industry stakeholders. The division is responsible for the following:

- Informing Congress, federal agencies, and state and local governments regarding NTSB activities and advising the Chairman, Vice Chairman, Board Members and staff on congressional and legislative matters.
- Coordinating responses to requests for information and assistance from Congress, the White House, the Government Accountability Office (GAO), other federal agencies, and state and local governments through correspondence and briefings.
- Helping the Chairman, Vice Chairman, and Board Members, and staff with legislative testimony.
- Providing launch support to the Chairman, Vice Chairman, Board Members, and accident investigators.
- Monitoring federal and state legislative activity relevant to NTSB recommendations.
- Coordinating development of NTSB legislative proposals and providing technical assistance to Congress and states in drafting legislation.
- Supporting modal offices in planning and executing forums and roundtables.
- Helping staff identify appropriate resources in state and local government to support investigations and other projects.
- Collaborating with the Safety Advocacy Division in support of its advocacy programs.



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## ***Transportation Disaster Assistance Division***

The TDA Division is responsible for the following:

- Carrying out NTSB statutory duty under the Aviation Disaster Family Assistance Act (49 U.S.C. section 1136) and the rail passenger disaster family assistance provisions of the Rail Safety Improvement Act of 2008 (49 U.S.C. section 1139).
- Responding to all major aviation accidents and rail accidents, as required by law.
- Supporting accident investigations in other modes of transportation, including regional aviation.
- Coordinating the federal services provided to accident survivors and victims' families, including crisis counseling, victim recovery and identification, and communication with foreign governments.
- Briefing families during the on-scene phase of an investigation and as needed throughout the investigation to provide updates and address family member concerns.
- Notifying victims and their family members regarding all NTSB proceedings and investigative products.
- Providing training and educational outreach regarding family assistance operations to other government agencies, organizations potentially affected by or involved in NTSB accident investigations, airline and airport personnel, transportation operators in other modes, and state and local governments to help ensure their preparedness for a major transportation disaster.

## ***Digital Services Division***

The Digital Services Division is responsible for the following:

- Public and stakeholder engagement via digital media.
- Implementing digital strategies to highlight NTSB's investigative and safety advocacy messages.
- Managing digital communications programs and platforms (website, social media, and visual media) to ensure consistent messaging across various digital channels and agency compliance with digital government policies and orders.
- Providing leadership and guidance regarding digital technology adoption for agency communications programs.
- Producing videos and animations, providing photography support, producing original graphics, and editing images in support of agency activities such as

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accident launches, development of investigative products, advocacy, and other NTSB activities.

## Accomplishments and Workload

### *Safety Advocacy Division*

The Safety Advocacy Division oversees the agency’s premier advocacy tool: the MWL program. Staff coordinated the development of and strategy for communicating the 2016 MWL, which was announced at a press conference in January 2016.. Staff also assisted the 10 advocacy teams in developing strategic communication and outreach plans, providing management support that included identifying and participating in speaking engagements, coordinating advocacy trips, drafting presentations, and assuming greater responsibility in scheduling and developing social media content, including the NTSB “Safety Compass” blog. During the year, division staff conducted 163 advocacy activities. Division staff also coordinate the NTSB’s response to the DOT Report to Congress on the MWL.

This year, Safety Advocacy staff developed and distributed two editions of the *Advocacy Spotlight* newsletter, which is released periodically via e-mail and social media outlets, to communicate with stakeholders and advocacy partners within and outside the NTSB, encourage support for safety issue areas, and highlight advances made in MWL issue areas. The division also unveiled its new product line, called “Lessons Learned,” in May 2016 after completion of the investigation into the May 12, 2015 derailment of Amtrak passenger train 188 in Philadelphia, Pennsylvania. The Lessons Learned content, released via several Facebook posts, discussed distraction, occupant protection, PTC, and recorders.

The division advocated for safety recommendations issued to specific states, supporting legislation for primary enforcement of seat belt laws in Massachusetts, impaired driving laws in California, and improvements in primary enforcement and distracted driving laws in Maryland, for example.

The division hosted transportation safety communications professionals from all modes of transportation at two Communicators Roundtables in FY 2016. Staff also supported advocacy work with several groups, giving presentations at the National Black Caucus of State Legislators Annual Conference, the Safety Council Annual Law Enforcement Awards, and the fifth annual Youth Open House and Transportation Safety Education Day, as well as speaking to the Maryland Teen Safe Driving Coalition, Students Against Destructive Decisions, the National Highway Traffic Safety Administration (NHTSA), the Governors’ Highway Safety Association, and the National Organizations for Youth Safety. Staff also participated in the National Safety Council and University of Iowa campaign entitled “My Car Does What?”; the Safe Kids webinar, “Town Hall on Child

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Passenger Safety Laws”; and an additional 17 safety advocacy events across the United States.

### ***Safety Recommendations Division***

In FY 2016, the Safety Recommendations Division staff reviewed and analyzed 579 responses from recommendation recipients and developed draft recommendation classification responses for Board review and approval. Additionally, the staff assisted the modal offices in developing and issuing 124 new safety recommendations.

Safety Recommendations staff developed 39 summary statistical reports on specific recommendation topics to support NTSB Board Members, NTSB staff, and the public. Topics addressed in these reports included a summary of recommendations issued related to balloon safety, recommendations concerning freight train derailments, and recommendations associated with “duck boat” operations. Additionally, division staff met with Board Members on 13 occasions to discuss recommendation status and staff efforts to encourage their acceptance. Division staff also provided input on recommendation development during the report-planning phase of 16 NTSB accident investigations conducted by the NTSB modal offices.

Outreach activities by Safety Recommendations staff included two presentations describing the safety recommendation process, one at the Air Venture Air Show in Oshkosh, Wisconsin, and one for aviation managers attending a training session at the NTSB Training Center. Division staff also participated in 32 meetings with government and industry organizations, including the Federal Highway Administration (FHWA), the FAA, NHTSA, the Federal Railroad Administration (FRA), the Federal Transit Administration (FTA), the USCG, the American Trucking Associations, and the Regional Airline Association to discuss and support the acceptance of previously issued recommendations. Safety Recommendations staff also participated as team members in two NTSB investigative processes including an evaluation of runway incursions and an evaluation of commercial balloon safety. Finally, Safety Recommendations staff initiated two internal evaluations of factors influencing safety recommendation acceptance. One project will evaluate the influence of industry-specific recommendations among nonrecipients within that industry community (bleed-over effect). The other project will examine factors that influence how regulatory agencies respond to NTSB recommendations.

### ***Media Relations Division***

In FY 2016, the Media Relations Division issued 86 news releases and media advisories, facilitated more than 150 interviews, responded to or handled hundreds of media inquiries, and provided media relations training to more than 500 people in the transportation industry and within the NTSB through more than 20 training evolutions. The Media Relations staff directly supported 17 events including Board meetings, roundtables, forums, and advocacy events. Media Relations staff deployed for seven launches led by an

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NTSB Board Member and four investigator-in-charge (IIC)-led launches. Media relations efforts supporting the launch of the 2016 MWL resulted in 800 known news stories.

The division's focus on product effectiveness and quality has resulted in news releases that frequently featured quotes from NTSB leadership, included hyperlinks to featured content, and incorporated NTSB imagery. These news release elements capitalize on the digital information environment to more fully engage the public and stakeholders in NTSB news.

### *Government and Industry Affairs Division*

The Government and Industry Affairs Division is the NTSB's principal liaison with Congress, federal agencies, state and local governments, and industry stakeholders. As part of the division's outreach activities, staff responded to hundreds of requests for information on each mode and initiated outreach to congressional, state, and local officials who have expressed an interest in improving transportation safety. In addition, staff arranged 43 briefings between NTSB and congressional, state, and local officials on various NTSB investigations and safety issue areas. Division staff also arranged for congressional staff tours of the NTSB's laboratories to provide them with a better understanding of the NTSB's investigative process.

In response to congressional oversight and to educate congressional and state legislative staff regarding NTSB's activities, Government and Industry Affairs staff prepared the NTSB Chairman to testify at one congressional hearing, submitted 11 statutorily required reports to Congress, and coordinated the responses to seven engagements from the GAO. Staff organized meetings between the NTSB and the GAO on topics such as electronically controlled pneumatic brakes; school bus safety; small, unmanned aircraft systems (sUASs); train crew emergency response preparedness; pipeline materials and corrosion; and the Washington Metropolitan Area Transit Authority (WMATA). Additionally, staff supported a Board Member's testimony before the Massachusetts Joint Committee on the Judiciary on primary enforcement seat belt legislation, as well as before the New Jersey Assembly Committee on Transportation and Independent Authorities on distracted driving legislation and before the Montgomery County (Maryland) Council on the Silver Spring, Maryland, pipeline rupture investigation. Division staff also arranged staff-level briefings for congressional and state and local officials on ongoing investigations and recommendations, including NTSB's investigation into the January 12, 2015, WMATA accident at L'Enfant Plaza in Washington, DC, and WMATA safety oversight.

Division staff coordinated review of major legislation, including the FAA and Surface Transportation reauthorization acts, providing technical and draft assistance and ensuring that NTSB safety recommendations were considered. In addition, staff worked with the NTSB general counsel, managing director, and modal offices to develop legislative proposals for possible NTSB reauthorization legislation.

The Government and Industry Affairs Division supported three accident launches on scene and the remaining major NTSB launches, as well as several GA regional

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investigations, from headquarters. The division is the main point of contact for additional inquiries from local, state, and federal officials as these investigations continue.

### ***Transportation Disaster Assistance Division***

During FY 2016, TDA Division staff launched to six aviation accidents, one marine accident, two highway accidents, one rail accident, and one pipeline accident. Staff provided non-launch support for an additional 268 domestic aviation accidents, 13 international aviation accidents, 11 rail accidents, 11 highway accidents, 1 pipeline accident, and 2 marine accidents. Staff managed an average of 30 cases per week. TDA staff also assisted family members of transportation accident victims and served as a technical resource for the Chairman and Board Members regarding family member attendance at five Board meetings.

TDA staff participated in 52 outreach training events, resulting in direct contact with approximately 3,900 participants. Staff responded to inquiries for information from 7 international agencies and organizations; 42 US federal agencies and departments within agencies; 51 state and local agencies; 101 transportation industry organizations; and 65 professional organizations, educational institutions, and other aid organizations.

In collaboration with the NTSB Training Center, TDA staff organized a 2.5-day course that provides an overview of family assistance operations associated with transportation disasters. The April 2016 rendition of this course had 41 attendees from across the transportation industry, local, state, and federal agencies and other entities interested in family assistance operations, and the September course had 65 attendees. Additionally, division staff coordinated a 2-day course focused on victim accounting after transportation mass casualty incidents. Course faculty consisted of three NTSB staff members and five guest presenters representing the local and state emergency management and medicolegal communities, hospitals, and federal agencies. The course had 33 attendees from across the transportation industry, local, state, and federal agencies and other entities involved in victim accounting operations. TDA staff also participated in five other training courses hosted by the NTSB Training Center.

During FY 2016, TDA staff coordinated a one-day Air Carrier Industry Disaster Response and Family Assistance Meeting. This yearly meeting serves as an opportunity for the air carrier community to discuss their family assistance programs and to share insights from recent family assistance responses. There were 89 attendees representing 44 domestic and foreign air carriers, as well as Amtrak and the American Red Cross.

In support of the air carriers that hold responsibilities under the Aviation Disaster Family Assistance Act (49 U.S.C. section 1136), TDA also organized a 1-day seminar titled “Standardization Program for Air Carrier Family Assistance Trainers.” Approximately 45 representatives responsible for training their organization’s family assistance response teams participated in the seminar.

TDA’s outreach efforts to airport communities continued during FY 2016. TDA staff are participating in the Transportation Research Board Airport Cooperative Research

Program's efforts to develop guidance and training materials for airports interested in developing family assistance programs. TDA staff conducted seven airport disaster response seminars and exercises and were invited to participate in the Aircraft Rescue and Fire Fighting Working Group Chief Leadership Conference and the American Association of Airport Executives Emergency Management Conference. These airport-related outreach events resulted in direct contact with approximately 937 attendees.

In FY 2016, TDA developed a series of web conferences focused on a variety of family assistance topics designed to enhance outreach efforts with various stakeholders. The inaugural web conference focused on family assistance legislation and the Federal Family Assistance Plan for Aviation Disasters. At this conference, 141 participants represented over 60 domestic and foreign air carriers. The second web conference was developed in collaboration with the US Department of State and explored the roles and responsibilities of each of the two agencies after accidents that occur within the United States involving foreign carriers or foreign nationals and accidents that occur overseas involving US citizens. The web conference also addressed ICAO initiatives focused on family assistance matters. At this conference, 97 participants represented 61 domestic and foreign air carriers.

### *Digital Services Division*

In FY 2016, the Digital Services Division completed more than 600 requests for information release via the web, social media, or visual media (graphics, publications, and video). Digital Services staff supported 13 major accident investigation launches; 9 Board meetings; and 11 public forums, symposia, or other events. Division staff managed outgoing agency communications on the public website as well as on the agency's five social media platforms, increasing engagement with the public and other stakeholders, and developed an editorial calendar to consistently produce informational content for the agency's digital platforms.

In addition, Digital Services staff led a major redesign and development project for the new NTSB website, working with stakeholders from across the agency to improve the functionality and usability of the website and to implement recommended improvements. TDA was one of the participants in the Web Redesign Team, focusing on propelling the NTSB's current website design into a more user-friendly and accessible site for family members and survivors affected by an accident. TDA's areas of interest for this project include, but are not limited to, data integration, investigation information sharing and display, and investigation tracking processes.

## AVIATION SAFETY

<b>Aviation Safety</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$31,959	129
FY 2018 Request	\$31,706	126
Increase/Decrease	(\$253)	(3)

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. A reduction in staff of 3 FTEs is required to meet the FY 2018 request level. No other program changes are planned.

### Program Description

The mission of the Office of Aviation Safety (AS) is as follows:

- Investigate all air carrier, commuter, and air taxi accidents and certain serious incidents; in-flight collisions; fatal and nonfatal GA accidents and serious incidents; UAS and public aircraft accidents and serious incidents; and commercial space launch/reentry accidents.
- Participate in the investigation of major airline crashes in foreign countries that involve US carriers, US-manufactured or -designed equipment, or US-registered aircraft to fulfill US obligations under ICAO agreements.
- Investigate safety issues that extend beyond a single accident to examine specific aviation safety problems from a broader perspective.

AS conducts investigative activities through five specialty divisions based in Washington, DC, and a regional investigation management structure consisting of four regions. Investigators are located throughout the country. International aviation activities are coordinated from the Washington, DC, office.

### *Major Investigations Division*

The Major Investigations Division of AS performs the following functions:

- Provides IICs for air carrier domestic aircraft accident and incident investigations, certain public aircraft accidents and incidents, commercial space launch/reentry accidents, and UAS accident and incident investigations.



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- Coordinates the preparation of comprehensive aviation accident and incident reports and manages aviation investigative hearings, forums, and conferences.
  - Coordinates and supervises the efforts of NTSB group chairmen and external investigation participants who are provided by industry, other government agencies, and foreign authorities (for US investigations involving foreign-operated, -registered, -manufactured, or -designed aircraft).
  - Provides accredited representatives to assist in the investigation of civil aviation accidents that occur in other countries. (The accredited representative informs domestic aviation interests of the progress of an investigation, while providing needed technical expertise, as requested, to foreign accident investigation counterparts, and informs FAA and US industry representatives of issues that may affect US aviation safety or the safety of aircraft or aircraft components manufactured in the United States.)
  - Develops NTSB investigative capabilities and agency strategy in new and innovative transportation industries to improve safety. Current areas of development include increasing NTSB comprehensive and technical proficiency in UAS accident and incident investigation as well as use for accident scene documentation and commercial space launch/reentry accident investigation.

As applicable for domestic accident and incident investigations, a specialist in operational factors, aviation engineering, human performance, or survival factors (and other NTSB organizational elements, as appropriate) may act as a group chairman on a major investigation to examine issues in their specialty area. Group chairmen lead their respective groups in the technical investigation of an accident under the direction of the IIC and produce a factual report that is placed in the NTSB public docket. They also produce analytical reports that are used in developing the draft accident report and proposed safety recommendations. NTSB technical specialists may also provide specialized assistance through the US-accredited representative in foreign accident and incident investigations.

### ***General Aviation Accident Investigations Division***

The General Aviation Accident Investigations Division staff comprises recent graduates selected from the Federal Pathways Program. They are responsible for investigating and documenting minor accidents (data collection investigations), conducting some nonfatal limited investigations and engine teardowns, and assisting with foreign accident notifications and investigations. This division has reduced the workload of more senior journeyman and senior accident investigators so that they can better focus on investigating more complex accidents, developing safety recommendations, conducting external industry safety outreach, and advocating safety initiatives.



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## ***Operational Factors Division***

The Operational Factors Division examines issues related to air traffic control (ATC), flight operations, and meteorology, as follows:

- ATC facilities, procedures, and flight handling, including developing flight histories and animations from air route traffic control centers and terminal facility radar records.
- Operations of the air carrier and airport; training, experience, and operational performance of flight crews; and FAA surveillance of flight operations.
- Meteorological/environmental conditions that may have caused or contributed to an accident and pertinent meteorological products, procedures, and services provided by government and industry.
- Commercial space crewmember training, experience, and operational performance.

## ***Aviation Engineering Division***

The Aviation Engineering Division examines all issues related to powerplants, structures, systems, system safety, and maintenance as follows:

- Powerplant components, including the airworthiness of aircraft engines and propellers.
- Integrity of aircraft structures and flight controls, including the adequacy of design and certification.
- Airworthiness of aircraft flight controls and electrical, pneumatic, hydraulic, and avionics systems.
- Hazards and associated safety risks introduced by aircraft systems and equipment failures, including the adequacy of design and certification.
- Service history and maintenance of aircraft systems, structures, and powerplants.
- Airworthiness of helicopters, including powerplants, structures, and control systems.
- Commercial spacecraft engines, structure, and systems.

## ***Human Performance/Survival Factors Division***

AS human performance specialists assess the knowledge, experience, training, and physical abilities of those whose actions may have caused or contributed to an accident or incident. They review the adequacy of established procedures, examine work habit patterns and interrelationships among crewmembers and managers to assess organizational factors and safety culture, and investigate the ergonomics of equipment design and the potential

effects of that design on operator performance. A human performance investigation may also include an assessment of sleep and rest cycles and drug or alcohol use.

Survival factors specialists examine factors that affect the survival of those involved in accidents, including the causes of injuries sustained by occupants of the aircraft or by others. They also examine safety procedures, search and rescue operations, crashworthiness, equipment design, emergency response and escape, crewmember emergency procedures training, and airport certification.

### ***Writing and Editing Division***

The Writing and Editing Division manages the development of and writes major aviation reports, as well as writes and edits accident briefs, safety recommendation reports, special investigation reports, safety alerts, responses to notices of proposed rulemaking, and general correspondence. The division also manages NTSB's aviation accident database.

### ***Regional Offices***

Although many regional accident/incident investigations may be much smaller in scope than those led by IICs at the Washington, DC, headquarters, they are conducted in a similar manner. Often, a single aviation safety investigator (ASI) conducts the investigation, gathering detailed information and working with party representatives. During each investigation, ASIs consider ways to prevent similar accidents from recurring through a more immediate and informal solution (known as a safety accomplishment) or through the formal safety recommendation process. In addition, ASIs often provide support to major accident investigations and may identify accidents that have broader safety issues to be addressed in a forum, at a Board meeting, or through a special investigation report. In these cases, additional staff from headquarters are often assigned to assist the ASIs in gathering the facts, developing the analysis, and drafting the final report.

See Appendix C for AS regional office locations.

## **Accomplishments and Workload**

This office's accomplishments include issuance of a number of products related to transportation safety arising from completed and ongoing investigations. Some of the office's more significant products completed October 1, 2015 through September 30, 2016 are highlighted below, together with information on other efforts and focus areas important to both the current and future mission of the agency.

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## Accident Reports

Accident reports are issued for major accidents and are adopted by the Board.

### **Runway Excursion During Landing, Delta Air Lines Flight 1086, Boeing MD-88 New York, New York March 5, 2015**

On March 5, 2015, Delta Air Lines flight 1086, a Boeing MD-88, N909DL, was landing on runway 13 at LaGuardia Airport, New York, New York, when it departed the left side of the runway, contacted the airport perimeter fence, and came to rest with the airplane's nose on an embankment next to Flushing Bay. The 2 pilots, 3 flight attendants, and 98 of the 127 passengers were not injured; the other 29 passengers received minor injuries. The airplane was substantially damaged. Flight 1086 was a regularly scheduled passenger flight from Hartsfield-Jackson Atlanta International Airport, Atlanta, Georgia, operating under the provisions of 14 *Code of Federal Regulations (CFR)* Part 121. An instrument flight rules (IFR) flight plan had been filed. Instrument meteorological conditions (IMC) prevailed at the time of the accident.

During the approach of the accident flight, the flight crews of two preceding airplanes reported good braking action on the runway, so the flight crew expected to see at least some of the runway's surface after the airplane broke out of the clouds. However, the flight crew saw that the runway was covered with snow, which was inconsistent with their expectations based on the braking action reports and the snow clearing operations that had concluded less than 30 minutes before the airplane landed. The snowier-than-expected runway, along with its relatively short length and the presence of Flushing Bay directly off the departure end of the runway, most likely increased the captain's concerns about his ability to stop the airplane within the available runway distance, which exacerbated his situational stress.

The captain made a relatively aggressive reverse thrust input almost immediately after touchdown to decelerate the airplane during the landing roll. Reverse thrust settings are expressed as engine pressure ratio (EPR) values. Both pilots were aware that 1.3 EPR was the target setting for contaminated runways. As reverse thrust EPR was rapidly increasing, the captain's attention was focused on other aspects of the landing, which included steering the airplane to counteract a slide to the left and ensuring that the spoilers had deployed (a necessary action for the autobrakes to engage). The maximum EPR values reached during the landing were much higher than the target setting of 1.3 EPR. The high EPR values caused rudder blanking (which occurs on MD-80 series airplanes when smooth airflow over the rudder is disrupted by high reverse thrust) and a subsequent loss of aerodynamic directional control. Although the captain stowed the thrust reversers and applied substantial right rudder, right nosewheel steering, and right manual braking, the airplane's departure from the left side of the runway could not be avoided because directional control was regained too late to be effective.

The NTSB determined that the probable cause of this accident was the captain's inability to maintain directional control of the airplane due to his application of excessive

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reverse thrust, which degraded the effectiveness of the rudder in controlling the airplane's heading. Contributing to the accident were the captain's (1) situational stress resulting from his concern about stopping performance and (2) attentional limitations due to the high workload during the landing, which prevented him from immediately recognizing the use of excessive reverse thrust.

As a result of this investigation, the NTSB issued safety recommendations to the FAA, Boeing, US operators of MD-80 series airplanes, and the Port Authority of New York and New Jersey.

Recommendations: 14 new, 1 reiterated  
Report adopted: September 13, 2016

### **Aerodynamic Stall and Loss of Control During Approach, Embraer EMB-500 Gaithersburg, Maryland December 8, 2014**

On December 8, 2014, an Embraer EMB-500 airplane (marketed as the Phenom 100), N100EQ, registered to and operated by Sage Aviation LLC, crashed while on approach to runway 14 at Montgomery County Airpark, Gaithersburg, Maryland. The airplane impacted three houses and the ground about 3/4 mile from the approach end of the runway. A postcrash fire involving the airplane and one of the three houses, which contained three occupants, ensued. The pilot, the two passengers, and the three people in the house died as a result of the accident. The airplane was destroyed by impact forces and postcrash fire. The flight was operating on an IFR flight plan under the provisions of 14 *CFR* Part 91.

The NTSB's investigation found that the pilot did not use the airplane's wing and horizontal stabilizer deice system during the approach, which led to ice accumulation on those surfaces, an aerodynamic stall at a higher airspeed than would occur without ice accumulation, and the occurrence of the stall before the aural stall warning sounded or the stick pusher activated. Because the deice system was not activated by the pilot before landing, the band indications (low speed awareness) on the airspeed display did not appropriately indicate the stall warning speed. The NTSB's aircraft performance study found that there would have been sufficient warning of an aerodynamic stall had the wing and horizontal stabilizer deice system been used during the approach. Once the airplane stalled, its altitude was too low to recover.

The NTSB determined that the probable cause of this accident was the pilot's conduct of an approach in structural icing conditions without turning on the airplane's wing and horizontal stabilizer deice system, leading to ice accumulation on those surfaces, and without using the appropriate landing performance speeds for the weather conditions and airplane weight, as indicated in the airplane's standard operating procedures, which together resulted in an aerodynamic stall at an altitude at which a recovery was not possible.

As a result of this investigation, the NTSB issued safety recommendations to the FAA, the General Aviation Manufacturers Association, and the National Business Aviation

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Association to support safe operation of turboprop airplanes that require a type rating and are certified for single-pilot operations and flight in icing conditions, such as the EMB-500.

Recommendations: 3 new  
Report adopted: June 7, 2016

### ***Accident Briefs***

Accident briefs are more limited in scope than major accident reports, with the primary purpose of determining probable cause. They may be adopted by the Office Director under delegated authority or may be adopted by the Board. Not all completed briefs are included here. There have been 1,221 briefs completed by AS in FY 2016. The briefs below are examples of the types of accidents that our regional investigators investigate each year.

#### **Airbus Helicopters AS350B Tahoma, California August 1, 2014**

On August 1, 2014, an SNIAS (Airbus Helicopters) AS350B, N3597T, collided with terrain on the shoreline of Buck Island Lake, near Tahoma, California. The helicopter was registered to and operated by Heli-Flite Inc. (doing business as Aris Helicopters), under the provisions of 14 *CFR* Part 135. The airline transport pilot and one passenger sustained serious injuries; the remaining two passengers were not injured. The helicopter sustained substantial damage during the accident sequence. The local flight departed from a helispot at Loon Lake, California, with a planned destination of Buck Island Lake. Visual meteorological conditions (VMC) prevailed, and a company flight plan had been filed.

Given the helicopter's estimated gross weight, it was likely operating very close to or slightly above its hovering ceiling. Therefore, it is likely that the pilot attempted to hover the helicopter out of ground effect at an altitude above its hovering ceiling, which resulted in it settling with power. The NTSB determined that the probable cause of this accident was the pilot's loss of helicopter control due to settling with power while maneuvering for takeoff.

Recommendations: None  
Brief adopted: August 10, 2016

#### **Fairchild SA227-AC Loss of Control La Alianza, Puerto Rico December 2, 2013**

On December 2, 2013, a Fairchild SA227-AC, N831BC, operating as IBC Airways flight 405 ("Chasqui 405"), was destroyed during a rapid descent and subsequent inflight breakup near La Alianza, Puerto Rico. The captain and the first officer died. Night VMC prevailed. The international cargo flight was operating on an IFR flight plan between

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Las Americas International Airport, Santo Domingo, Dominican Republic, and San Juan International Airport, San Juan, Puerto Rico, under the provisions of 14 *CFR* Part 135.

The moderately loaded cargo airplane was not equipped with a flight data recorder (FDR) or cockpit voice recorder (CVR) (although it previously had a CVR in its passenger configuration), nor was it required by FAA regulations. There were also no avionics on board with downloadable or nonvolatile memory. As a result, there was limited information available to determine what led to the uncontrolled descent or what occurred as the flight crew attempted to regain control of the airplane.

The NTSB determined that the probable cause of this accident was the flight crew's excessive elevator input during a rapid descent under night lighting conditions, which resulted in the overstress and breakup of the airplane. Contributing to the accident was an initial loss of airplane control for reasons that could not be determined because post accident examination revealed no mechanical anomalies that would have precluded normal operation.

Recommendations: None  
Brief adopted: July 25, 2016

### **Cirrus SR22 Airplane and Robinson R44 II Helicopter Midair Collision Frederick, Maryland October 23, 2014**

On October 23, 2014, a Cirrus SR22 airplane, N122ES, operated by a private individual, and a Robinson R44 II helicopter, N7518Q, operated by Advanced Helicopter Concepts, collided in midair approximately 1 mile southwest of the Frederick Municipal Airport, Frederick, Maryland. The airplane departed controlled flight after the collision, the ballistic parachute system was deployed, and the airplane landed nose-down in a thicket of low trees and brush. The helicopter also departed controlled flight, descended vertically, and was destroyed by impact forces at ground contact. The private pilot on board the airplane was not injured, and his passenger sustained a minor injury. The flight instructor, commercial pilot, and a passenger in the helicopter died. VMC prevailed, and an IFR flight plan was filed for the airplane, which departed Cleveland, Tennessee, on a personal flight about 1247. No flight plan was filed for the helicopter, which departed Frederick Municipal Airport on an instructional flight. The flights were conducted under the provisions of 14 *CFR* Part 91.

The NTSB determined that the probable cause of this accident was the failure of the helicopter pilots and the airplane pilot to maintain an adequate visual lookout for known traffic in the traffic pattern, which resulted in a midair collision. Contributing to the accident were the airplane pilot's descent below the published airplane traffic pattern altitude (TPA) and the helicopter pilot's climb above the proper helicopter TPA as prescribed in the FAA's *Aeronautical Information Manual* for airports without published helicopter TPAs. Also contributing to the accident were the lack of a published helicopter

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TPA, the absence of radar equipment in the tower, and the controller's inadequate task prioritization.

Recommendations: None  
Brief adopted: May 23, 2016

**Cessna 152 Visual Flight Rules (VFR) Flight into Instrument Conditions  
New Smyrna Beach, Florida  
January 13, 2015**

On January 13, 2015, a Cessna 152, N757ZM, collided with a public beach at New Smyrna Beach, Florida. The commercial pilot died, and the airplane was substantially damaged by impact forces. The airplane was registered to a private company and was operated by the pilot under the provisions of 14 *CFR* Part 91 as a personal flight. Night IMC prevailed for the flight, and no flight plan was filed. The local flight originated from Massey Ranch Airpark, Edgewater, Florida.

The NTSB determined that the probable cause of this accident was the pilot's failure to maintain control of the airplane while operating under VFR in night IMC, likely due to spatial disorientation. Contributing to the outcome was the radar controller's failure to follow published guidance for providing assistance to VFR pilots having difficulty flying in instrument conditions.

Recommendations: None  
Brief adopted: April 14, 2016

**Piper PA-32RT-300T Loss of Control  
Near Hugheston, West Virginia  
April 11, 2014**

On April 11, 2014, a Piper PA-32RT-300T, N39965, impacted trees and terrain near Hugheston, West Virginia. The commercial pilot and passenger died, and the airplane was destroyed. IMC prevailed along the route of flight, and an IFR flight plan was filed. The personal flight departed Akron Fulton International Airport, Akron, Ohio, and was destined for Spartanburg Downtown Memorial Airport, Spartanburg, South Carolina. The airplane was registered to C.W. Air, LLC, and operated under the provisions of 14 *CFR* Part 91.

The NTSB determined that the probable cause of this accident was the pilot's loss of airplane control while operating in IFR conditions.

Recommendations: None  
Brief adopted: March 9, 2016



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**King Air B200 Impact With Building  
Wichita, Kansas  
October 30, 2014**

On October 30, 2014, a Raytheon Aircraft Company King Air B200 airplane, N52SZ, impacted the FlightSafety International building located on the airport infield during initial climb from Wichita Mid-Continent Airport, Wichita, Kansas. The airline transport pilot, who was the sole occupant, died, and the airplane was destroyed. Three building occupants died, two occupants sustained serious injuries, and four occupants sustained minor injuries. The airplane was registered to and operated by Gilleland Aviation, Inc., Georgetown, Texas, under the provisions of 14 *CFR* Part 91 as a ferry flight. The flight was originating from Wichita Mid-Continent Airport at the time of the accident and was en route to Mena Intermountain Municipal Airport, Mena, Arkansas.

The NTSB determined that the probable cause of this accident was the pilot's failure to maintain lateral control of the airplane after a reduction in left engine power and his application of inappropriate rudder input. Contributing to the accident was the pilot's failure to follow the emergency procedures for an engine failure during takeoff. Also contributing to the accident was the left engine power reduction for reasons that could not be determined because a post accident examination did not reveal any anomalies that would have precluded normal operation and thermal damage precluded a complete examination.

Recommendations: None  
Brief adopted: March 1, 2016

**Cessna 208B Impact with Terrain  
Kwethluk, Alaska  
April 8, 2014**

On April 8, 2014, a Cessna 208B Caravan airplane, N126AR, impacted terrain about 22 miles southeast of Kwethluk, Alaska. The airplane was being operated by Hageland Aviation Services, Inc., doing business as Ravn Connect, Anchorage, Alaska, as a VFR training flight under the provisions of 14 *CFR* Part 91. The two crewmembers, a check airman and a newly hired second-in-command pilot, died, and the airplane was destroyed. Day VMC prevailed at the time of the accident, and company flight-following procedures were in effect. The local training flight had departed Bethel Airport, Bethel, Alaska.

The NTSB determined that the probable cause of this accident was the check airman's delayed remedial action and initiation of a recovery procedure after a simulated pitch trim excursion, which resulted in a loss of airplane control.

Recommendations: None  
Brief adopted: February 26, 2016



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**Cessna 208B Impact with Terrain  
St. Mary's, Alaska  
November 29, 2013**

On November 29, 2013, a Cessna 208B Grand Caravan airplane, N12373, impacted terrain about 1 mile southeast of St. Mary's Airport, St. Mary's, Alaska. The airplane was being operated as flight 1453 by Hageland Aviation Services, Inc., doing business as Era Alaska, Anchorage, Alaska, as a VFR scheduled commuter flight under the provisions of 14 *CFR* Part 135. Of the 10 people on board, the commercial pilot and 3 passengers died, and 6 passengers sustained serious injuries. The airplane was substantially damaged. Night IMC prevailed at St. Mary's Airport at the time of the accident, and company flight-following procedures were in effect. Flight 1453 departed from Bethel Airport, Bethel, Alaska, destined for Mountain Village, Alaska. Before reaching Mountain Village, the flight diverted to St. Mary's due to deteriorating weather conditions.

The NTSB determined that the probable cause of this accident was the pilot's decision to initiate a VFR approach into an area of IMC at night and the flight coordinators' release of the flight without discussing the risks with the pilot, which resulted in the pilot experiencing a loss of situational awareness and subsequent controlled flight into terrain. Contributing to the accident were the operator's inadequate procedures for operational control and flight release and its inadequate training and oversight of operational control personnel. Also contributing to the accident was the FAA's failure to hold the operator accountable for correcting known operational deficiencies and ensuring compliance with its operational control procedures.

Recommendations: None  
Brief adopted: February 26, 2016

**US Airways Flight 1702  
Philadelphia, Pennsylvania  
March 13, 2014**

On March 13, 2014, US Airways flight 1702, an Airbus A320, N113UW, experienced substantial damage after the captain rejected the takeoff after rotation on runway 27L at Philadelphia International Airport, Philadelphia, Pennsylvania. The airplane came to rest on the edge of the runway, and the crew and passengers exited via the emergency slides. Of the 149 passengers, 2 pilots, and 3 flight attendants on board, 2 passengers reported minor injuries related to the evacuation. The flight was operating under 14 *CFR* Part 121 as a regularly scheduled passenger flight from PHL to Fort Lauderdale/Hollywood International Airport, Fort Lauderdale, Florida.

The NTSB determined that the probable cause of this accident was the captain's decision to reject the takeoff after the airplane had rotated. Contributing to the accident was the flight crew's failure to follow standard operating procedures by not verifying that the airplane's flight management computer was properly configured for takeoff and the

captain's failure to perform the correct action in response to the electronic centralized aircraft monitoring alert.

Recommendations: None  
Brief adopted: February 10, 2016

### *Domestic Investigative Workload Summarized by State*

The following table summarizes statistical information on domestic accident/incident investigations initiated from October 1, 2015, through September 30, 2016, by state. Investigation types are defined after the table.

State	Major Investigation	Field Investigation	Limited Investigation	Data Collection Investigation	Incident Investigation	Grand Total
ALABAMA		3	6	7		16
ALASKA		7	26	56	1	90
ARIZONA		8	13	21		42
ARKANSAS		5	8	9	2	24
CALIFORNIA		23	47	49	7	126
COLORADO		9	8	16		33
CONNECTICUT			3	3		6
DELAWARE			2	1		3
FLORIDA		16	39	30	3	88
GEORGIA		8	18	15	1	42
HAWAII		3	4	1	1	9
IDAHO		4	6	13		23
ILLINOIS		3	15	10		28
INDIANA		3	10	9		22
IOWA		2	8	6		16
KANSAS			9	12		21
KENTUCKY		1	6	4		11
LOUISIANA		3	11	7		21
MAINE			2	3		5
MARYLAND		2	2	14		18
MASSACHUSETTS		1	6	3		10
MICHIGAN		2	14	10	2	28
MINNESOTA		1	13	10		24
MISSISSIPPI		1	4	3		8
MISSOURI		4	14	11		29
MONTANA		3	2	15		20
NEBRASKA		5	4	4		13
NEVADA		5	10	14		29

State	Major Investigation	Field Investigation	Limited Investigation	Data Collection Investigation	Incident Investigation	Grand Total
NEW HAMPSHIRE			4	6		10
NEW JERSEY		2	5	10		17
NEW MEXICO		2	10	10		22
NEW YORK		6	15	13	1	35
NORTH CAROLINA		2	11	18		31
NORTH DAKOTA		1	5	3		9
OHIO	1	3	12	15		31
OKLAHOMA		2	10	9		21
OREGON		3	9	17		29
PENNSYLVANIA		5	13	15		33
RHODE ISLAND			2	2		4
SOUTH CAROLINA		2	8	8	1	19
SOUTH DAKOTA		2	4	2	2	10
TENNESSEE		5	14	6	1	26
TEXAS	1	13	55	50	1	120
UTAH		4	5	11		20
VERMONT			1	3		4
VIRGINIA		3	9	16		28
WASHINGTON		2	13	15	1	31
WEST VIRGINIA		1	3	4		8
WISCONSIN		4	17	7		28
WYOMING		2	3	2		7
Other			1	1		2
<b>Grand Total</b>	<b>2</b>	<b>186</b>	<b>539</b>	<b>599</b>	<b>24</b>	<b>1,350</b>

**Major Investigation:** A major investigation is a significant event, involving the launch of a team consisting of an IIC and one or more NTSB investigators or the use of significant NTSB investigative resources. These accidents typically involve loss of life, multiple injuries, considerable property damage, a new aircraft design, or significant public interest.

**Field Investigation:** A field investigation requires at least one NTSB investigator to travel to the accident site and conduct a follow-up investigation. Field accidents typically involve at least one fatality in an airplane that is FAA certified in the “normal” category. This category also encompasses field investigations involving an aircraft that is operated by a federal, state, or local government.

**Limited Investigation:** This category represents NTSB investigations in which

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investigators do not travel to the scene. An FAA inspector documents the accident site, and an NTSB investigator conducts the remainder of the investigation from the office or during a follow-up examination. These accidents typically do not involve fatalities. This category also encompasses limited investigations involving an aircraft that is operated by a federal, state, or local government.

***Data Collection Investigation:*** This category of investigation does not involve investigator travel and does not require significant investigative efforts. A brief report is completed for these investigations. These accidents must meet the following criteria:

- No fatalities or “critical” serious injuries.
- Statement from the pilot documenting that no mechanical malfunctions or safety issues were known.
- Lack of any obvious safety issues.
- Minimal public or industry visibility.

***Incident Investigation:*** This category defines occurrences involving one or more aircraft in which there is a hazard or potential hazard to safety, but the event is not classified as an accident because of the degree of injury or the extent of damage or because the circumstances of the injury or damage fall outside the definition of *aircraft accident* contained in 49 *CFR* 830.2. Incident investigations cover a broad range of events and may include the following:

- Damage to an aircraft that does not occur while passengers are on board.
- Runway incursion.
- Pilot deviation.
- Near midair collision.
- Aircraft malfunction.

When the NTSB conducts a full investigation of an incident, similar to an accident investigation, it determines probable cause. The NTSB focuses on those incidents that involve safety issues of high potential consequence and/or are of a systemic, recurring nature. An incident investigation may involve investigator travel.

## ***International Investigations***

The United States is a signatory to the Chicago Convention on International Civil Aviation, which is administered by ICAO. The NTSB is charged with fulfilling the US obligation for accident and incident investigations in accordance with Annex 13 of this agreement in full coordination with the US Department of State.

The international investigative process is critical to maintaining aviation safety in the United States and throughout the world. When an aircraft operated by—or designed, manufactured, or registered to—a US company has been involved in an accident in a

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foreign state, NTSB participation in that investigation enables the United States to ensure the airworthiness and operation of its aircraft operated here in the United States and overseas. ICAO Annex 13 protocols also define the NTSB's engagement with international authorities whose products or operations are involved in accidents within the United States. This international process of collaboration plays an important role in enabling the NTSB to identify safety concerns and issue appropriate recommendations. The NTSB has issued numerous safety recommendations that have resulted in safety improvements worldwide directly due to our participation in these foreign investigations.

In FY 2016, AS was notified of and assisted on 301 international investigations. Of these, investigators launched or traveled in support of 19 investigations. Several accidents required significant US involvement, including the following:

- **Singapore Airlines Flight SQ368, Singapore.** On June 27, 2016, Singapore Airlines flight SQ368, a Boeing 777, returned to Singapore after declaring an emergency due to engine problems. After touchdown, the right engine and wing caught fire. None of the 222 passengers and 19 crewmembers reported any injuries. The accident is being investigated by the Transport Safety Investigation Bureau of Singapore. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design for the airplane.
- **Egypt Air Flight 804, Mediterranean Sea.** On May 19, 2016, an Airbus A320-200, registration SU-GCC, operating as Egypt Air flight 804 from Charles de Gaulle Airport, Paris, France, to Cairo, Egypt, was en route at 37,000 feet over the Mediterranean Sea when the airplane's transponder signal ceased. The accident is being investigated by the Egyptian Civil Aviation Authority. The NTSB has appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture for the aircraft engines.
- **Mitsubishi MU2B-60, Iles-de-la-Madeleine, Quebec, Canada.** On March 29, 2016, a Mitsubishi MU2B-60, US-registered N246W, owned by Marquise Aviation Corporation Trustee, was destroyed when it impacted terrain under unknown circumstances 2 kilometers southwest of Iles-de-la-Madeleine Airport, Quebec, Canada. IMC prevailed at the time of the accident. The two pilots and five passengers died. The flight originated from St. Hubert, Quebec, Canada, and was en route to Iles-de-la-Madeleine Airport. The accident is being investigated by the Transportation Safety Board of Canada. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of registry for the airplane.
- **FlyDubai Flight FZ981, Rostov-on-Don, Russia.** On March 19, 2016, FlyDubai flight FZ981, a Boeing 737-800 airplane, impacted airport terrain during a second approach attempt in bad weather to Rostov-on-Don Airport in southern Russia. The 55 passengers and 7 crewmembers died, and the airplane was destroyed. The accident is being investigated by the Russian Interstate Aviation Committee. The NTSB appointed a US-accredited representative in

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accordance with ICAO Annex 13 because the United States is the state of manufacture and design for the airplane.

- **Augusta Westland AW609, Italy.** On October 30, 2015, an Augusta Westland tilt rotor aircraft, AW609, US-registered N609AG, experienced a loss of control during a test flight and impacted the ground near Tronzano Vercellese, Italy. The pilot and copilot died, and the aircraft was destroyed. The accident is being investigated by the Agenzia Nazionale Per La Sicurezza Del Volo. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of registry for the aircraft.

### *US Comments/Foreign Accident Reports*

The NTSB completed comments on behalf of the United States on several international investigations in which the United States had significant involvement under Annex 13, including the following:

#### **Crash After Takeoff, Shorts SD3 Sint Maarten, Netherlands Antilles October 29, 2014**

On October 29, 2014, a Shorts SD3-60, operated by Skyway Enterprises, crashed shortly after takeoff into the water adjacent to Sint Maarten-Juliana Airport, Sint Maarten, Netherlands Antilles. The two pilots on board died, and the airplane was destroyed. The flight was operating as a 14 *CFR* Part 135 international cargo flight and was destined for San Juan-Luis Munoz Marin International Airport, San Juan, Puerto Rico. The Department of Civil Aviation of Sint Maarten is investigating the accident. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design of the airplane. The United States provided comments on the department's draft report in June 2016.

#### **Crash on Approach to Muhammed Murtala Airport, Boeing MD-83 Lagos, Nigeria June 3, 2012**

On June 3, 2012, a Boeing MD-83, operated by Dana Airlines Limited as flight 992, crashed into a densely populated area during a forced landing after a total loss of power in both engines while on approach to Muhammed Murtala Airport, Lagos, Nigeria. VMC prevailed at the time, and the airplane was on an IFR flight plan. All 153 persons on board the airplane, including the 6 crewmembers, died. There were 10 confirmed ground fatalities. The airplane was destroyed, and there was a postimpact fire. The domestic scheduled commercial flight was operating from Abuja International Airport, Abuja, Nigeria, to Muhammed Murtala Airport.

The Nigeria Accident Investigation Bureau is investigating the accident. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design of the airplane and engines. The

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US team included representatives from the NTSB, the FAA, Boeing, and Pratt & Whitney Engines. The United States provided comments on the bureau's draft report in March 2016.

**Tire Failure During Takeoff, Boeing 767  
Madrid, Spain  
December 5, 2013**

On December 5, 2013, a Boeing 767-300ER, operated by Delta Air Lines as flight 415, experienced a tire failure during takeoff and then departed the paved surface of the runway while conducting an emergency landing at Madrid-Barejas International Airport, Madrid, Spain. There were no injuries to the 203 passengers and crewmembers on board, and the airplane was substantially damaged. The international scheduled passenger flight was destined for John F. Kennedy International Airport, New York, New York.

The Spanish Comisión de Investigación de Accidentes e Incidentes de Aviación Civil investigated the accident. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design of the airplane and engines. The US team included representatives from the NTSB, the FAA, Boeing, and Goodyear. The United States provided comments on the commission's draft report in March 2016.

**Crash While En Route to Algiers, Algeria, Boeing MD-83  
Near Gossi, Mali  
July 24, 2014**

On July 24, 2014, Air Algérie flight AH5017, a Boeing MD-83, crashed near Gossi, Mali, while en route from Ouagadougou Airport, Ouagadougou, Burkina Faso, to Algiers-Houari Boumediene Airport, Algiers, Algeria. All 110 passengers and 6 crewmembers on board died. The accident was investigated by a Malian Commission of Inquiry. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design of the airplane. The United States provided comments on the commission's draft report in March 2016.

**Crash During Climb, ATR-72  
Taipei, Taiwan  
February 4, 2015**

On February 4, 2015, TransAsia Airways flight GE-235, an ATR-72, crashed during initial climb from Taipei-Sung Shan Airport, Taipei, Taiwan. Of the 53 passengers and 5 crewmembers on board, 35 died. The Aviation Safety Council of Taiwan investigated the accident. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design of the propeller. The United States provided comments on the council's draft report in March 2016.



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**Crash During Approach, Boeing 737  
Kazan, Russia  
November 17, 2013**

On November 17, 2013, Tatarstan Airlines flight 363, a Boeing B737-500, registration VQ-BBN, crashed while attempting to land on runway 29 at Kazan Airport, Kazan, Russia. All 44 passengers and 6 crewmembers on board died, and the airplane was destroyed from impact forces and post crash fire. The domestic passenger flight originated from Domodedovo International Airport, Moscow, Russia.

The Russian Interstate Aviation Committee, Accident Investigation Commission investigated the accident. The NTSB appointed a US-accredited representative in accordance with ICAO Annex 13 because the United States is the state of manufacture and design of the airplane and engines. The US team included representatives from the NTSB, the FAA, Boeing, and Pratt & Whitney Engines. The United States provided comments on the commission's draft report in November 2015.

***Safety Recommendation Reports***

AS investigators often identify safety issues during the course of field, limited, or incident investigations that warrant further scrutiny. Safety recommendation reports are used to make recommendations on issues identified during such investigations in which a major report is not warranted. Safety recommendation reports may be issued at any time during an accident investigation. If the Board determines that a recommended course of action requires immediate attention to avoid imminent loss of life due to a similar accident, the safety recommendation is designated as “urgent.” In FY 2016, AS developed safety recommendation reports for issuance by the Board on the following topics:

- Two safety recommendations were issued to the FAA concerning ineffective air traffic controller identification and response to imminent or existing emergency situations. Five accidents were cited in which controllers should have recognized that a pilot was experiencing an emergency. The Board determined that the current training provided to air traffic controllers is not effective in preparing them to provide appropriate assistance to aircraft in distress.
- Three safety recommendations were issued to the FAA and one recommendation was issued to the European Aviation Safety Agency concerning two 2015 accidents involving helicopters manufactured by Airbus Helicopters. In both accidents, the impact forces were survivable for occupants, but fatal and serious injuries occurred because of postcrash fires that resulted from an impact-related breach in the fuel tanks.
- Five safety recommendations were issued to the airplane manufacturer Bombardier, Inc., concerning a June 2015 incident involving United Express flight 4776 (operated by CommutAir), a Bombardier DHC-8-202, which



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experienced an in-flight fire at the right windshield terminal block while on approach to Bradley International Airport, Windsor Locks, Connecticut.

### ***Completed and Ongoing Special Investigations***

NTSB special investigations usually involve analysis of data from multiple accidents centered on a common safety issue. Products of the special investigation process generally include a report with safety recommendations.

#### **Runway Incursions**

A runway incursion is any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft. Although a fatal runway incursion has not occurred in the United States since 2006 in Lexington, Kentucky, runway incursions continue to be a daily event in the national airspace system (NAS) with serious incursions presenting a potential for loss of life. Airport operations in the NAS have been declining over the past several years, yet serious runway incursions have been increasing. Data show an increasing trend in runway incursions resulting from an error by an air traffic controller, a pilot, an airport employee, a process or procedure, equipment failure or malfunction, or a combination of these elements. Accordingly, the NTSB has begun a runway incursion special investigation to identify the root cause(s) of these incursions and mitigations to the threat of runway incursions. This special investigation report will focus on runway incursion causes, effects, and mitigation efforts. The report will include an overview of runway incursion history, mitigation efforts to date, areas of concern, and recommendations and suggestions to reduce the frequency and severity of systemic and airport-specific runway incursions.

#### **Pilot Weather Reports (PIREPs) in the National Airspace System**

PIREPs are one of the most important datasets for real-time identification of aviation weather hazards. Pilot- and aircraft-reported information provide the only in-situ identification of aircraft icing and turbulence severity and provide verification of cloud tops and bases and the strength and altitudes of low-level windshear. The information provided can be used in real-time by air traffic controllers, dispatchers, and meteorologists to provide timely and accurate warnings and alerts to pilots in the NAS to help avoid hazardous weather encounters. This special investigation report examines PIREP-related findings across a number of accident investigations conducted since 2012 and explores how weather information is communicated between pilots, dispatchers, controllers, and others. The report identifies common breaking points that result in the failure to disseminate accurate and pertinent weather information. Improvements in the PIREP system, as recommended in the special investigation report, will not only enhance safety in the near term within the constraints of the current PIREP system but also will serve as

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the foundation for supporting the long-term solutions associated with Next Generation Air Transportation System and other emerging technologies.

## *Safety Alerts*

Safety alerts are brief information sheets that pinpoint a particular safety issue. They are primarily used to alert the GA community, which may not otherwise be reached through safety recommendations, of safety issues identified during the course of multiple investigations. Safety alerts provide information on the problem, examples of accidents, what pilots can do so that they do not repeat the same mistakes, and references for pilots to find additional information. These alerts are posted on the NTSB website, and brochures are distributed at outreach events that staff attends throughout the year. During FY 2016, AS developed the following safety alerts for issuance by the Board:

- **Pilots: Help ATC Help You: Do not hesitate to tell controllers if you have an emergency (issued August 26, 2016).** Recent investigations revealed that pilots might hesitate to declare an emergency to ATC because they are embarrassed about asking for help or think that they can handle it on their own. Even if pilots indicate that they have a problem or need help, the controller may not treat the situation as an emergency unless the pilot specifically declares it as such. ATC can be a powerful tool to a pilot in distress, offering priority handling, information about weather and traffic conflicts, and other emergency services to help the pilot complete the flight safely. This safety alert is intended to provide guidance to pilots on the use of ATC in emergency situations.
- **Control Foreign Object Debris: Account for all items after performing maintenance tasks! (issued June 20, 2016).** Since 2010, numerous accidents occurred in which maintenance personnel mistakenly left items in or near aircraft after maintenance or did not clean up residual debris; this foreign object debris migrated to critical flight systems or became ingested into the engine, leading to the accidents. This safety alert is directed to mechanics and others who help with aircraft maintenance.
- **Arriving at a Major Fly-In Event? Keep your focus on safety! (issued March 22, 2016).** Since 2007, several accidents occurred involving airplanes landing at major fly-in events. In these accidents, pilots lost control while landing and inadvertently exceeded their own performance limitations or those of their aircraft while operating in these unusual and demanding environments. This safety alert is designed to raise pilot awareness on a variety of measures important to maintaining aircraft control during arrival at such events.
- **Visual Illusions: The ground may be closer than it appears (issued March 22, 2016).** The NTSB has investigated many GA accidents in which flat light or whiteout conditions played a role. These conditions make it difficult for pilots operating under VFR to perceive depth, distance, or altitude. The purpose of this safety alert is to provide pilots resources to help them mitigate this risk.

- **Pilots: Fueling Mistakes and Line Personnel: Fueling matters (issued February 17, 2016).** These safety alerts address the risk of airplanes being incorrectly fueled with Jet A rather than aviation gasoline (avgas). Directed to pilots and line personnel who fuel aircraft, these safety alerts contain tips and resources to help prevent fueling mistakes.

## *Forums/Symposiums*

An NTSB forum or symposium is a public proceeding focused on a specific transportation safety topic in which invited participants provide presentations and answer questions from a panel of technical specialists. During FY 2016, AS organized the following Board-convened forums:

### **PIREPs: Pay it Forward...Because Weather for One is Weather for None June 21 – 22, 2016**

This 2-day forum focused on the need to improve the PIREP and weather dissemination process in the NAS and on future improvements and emerging technologies that may provide pilots greater awareness of weather conditions. Topics for the panel discussions included the following: the use and significance of PIREP information to weather services, air traffic controllers, pilots, and researchers; the lifecycle of a PIREP; PIREP training, education, and operations; and future improvements and emerging technologies for PIREPs. More than 16 aviation stakeholders and partners, including federal agencies, airlines, associations and academic organizations, participated in this forum, the results of which will be used in the NTSB's related special investigation report.

### **Humans and Hardware: Preventing General Aviation Inflight Loss of Control October 14, 2015**

This 1-day forum examined the problem of loss-of-control GA crashes and explored possible solutions. The agenda included an overview of the types of loss-of-control accidents, human performance and medical issues, potential pilot training improvements, and technological enhancements that can reduce loss-of-control accidents. The forum featured presentations from pilots, instructors, GA advocacy groups, the FAA, and manufacturers of potential technological countermeasures, among other contributors.

## **Other Efforts and Focus Areas**

### **Commercial Space Transportation Program Development**

The NTSB has been involved in commercial space investigations for over 30 years. In 2015, the agency completed the investigation of the first fatal commercial space launch accident, SpaceShip2, and completed the investigation into a Pegasus launch anomaly in 1993. In addition, since the mid-1980s, the NTSB has assisted in multiple other space investigations, including the Challenger Space Shuttle accident in 1986, the Titan II launch

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anomaly in 1988, the Columbia Space Shuttle accident in 2003, and the Genesis spacecraft mishap in 2004.

However, the growth of nonfederal, commercial space transportation operations has continued to accelerate under the oversight of the FAA’s Office of Commercial Space Transportation (AST). According to the FAA’s Commercial Space Transportation Forecasts report, projections show the growth of new commercial launch service providers for both cargo and human spaceflight transportation will continue to increase through the year 2021.

To prepare for this increasing number of commercial space launches and reentries, the NTSB has been developing specific and comprehensive policies and procedures to ensure the agency is in a position to effectively investigate accidents in this burgeoning industry. The Major Investigations Division has established strong relationships with numerous commercial space stakeholders, including launch operators (such as SpaceX, ULA, and Virgin Galactic) and other government agencies (such as the FAA/AST, NASA, and the United States Air Force (USAF)) to ensure that the NTSB is aware of best practices and techniques from other investigations, as well as to ensure the industry understands the NTSB investigative process in the event of a significant mishap.

### **Unmanned Aircraft Systems Program Development**

The use of civil UAS, particularly small UAS (sUAS), is growing rapidly, along with many recent regulatory changes concerning their operation. In particular, the FAA and the DOT’s Office of the Secretary issued a final rule in 2016 that adds new Part 107 to 14 *CFR* on the operation of sUAS. The FAA also recently issued a new “blanket Certificate of Waiver or Authorization” for commercial Section 333 and public aircraft operators. Although AS has already investigated a number of UAS accidents and incidents since 2006, the NTSB expects that these new FAA regulations and authorizations will result in a significant increase in the number of UAS operations in the NAS and, therefore, an increased risk of accident and incident occurrences involving unmanned aircraft moving forward. Operators of any civil UAS, other than those operated for hobby or recreational purposes, are required to report all accidents and certain incidents based on requirements contained in 49 *CFR* Part 830. AS is charged with investigating all commercial, civil UAS accidents and serious incidents, and to accomplish this mission mandate, the office must maintain investigator education and technical proficiency with this emerging segment of aviation.

In addition to AS’s investigation of UAS accidents and incidents under its mission mandate, the office is also exploring the innovative use of UAS technologies to facilitate on-scene investigation work. sUAS-mounted remote sensors and video could offer substantial benefits in finding and documenting wreckage and impact scars, particularly for aviation, rail, highway, and marine accidents that occur in hazardous or remote locations. AS believes such technology could improve the efficiency of on-scene work as well as offer enhancements to the quality of investigative data. To evaluate these potential benefits, AS is currently leading the conduct of a proof-of-concept project to demonstrate

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the use of UAS for on-scene documentation in all modes of transportation that the NTSB investigates and expects this proof-of-concept project to continue into FY 2017 as standard operating procedures and image documentation and analysis methods are developed and refined.

### **Loss of Control Accidents MWL Outreach**

One of the issue areas highlighted in the current MWL is “Prevent Loss of Control in Flight in General Aviation.” Statistically, approach to landing, maneuvering, and climb are the deadliest phases of flight for loss-of-control accidents. GA pilots typically need to complete a flight review, consisting of 1 hour of ground training and 1 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. NTSB staff has focused on the issue of loss of control accidents during outreach presentations throughout the year, including at Sun ‘n Fun in April 2016, the Experimental Aircraft Association’s AirVenture in July 2016, and numerous local fly-in celebrations throughout the country.

### **NTSB ADMS Software Upgrades and Improvements**

During FY 2016, AS undertook a number of projects to improve the efficiency of its processes and the accuracy of data that the agency is required to maintain. Such work included the following:

- Upgrading software to access legacy case data, allowing for easier correction of identified mistakes.
- Developing data quality validation rules to improve the accuracy of collected data.
- Improving data reporting capabilities to help ensure effective oversight and use of limited investigative resources.
- Expanding system search capabilities to allow investigative staff to more easily find relevant cases and safety issue areas.
- Developing automatic system notifications to meet the United States’ reporting requirements to ICAO, helping to minimize the administrative burden on investigative staff.
- Beginning work to enable mobile access to the office’s accident data management system.
- Introducing a new report format with user-friendly features, including links to the public docket, safety messages, and related products; a 1-page data summary report; and better incorporation of data tables and images.

## Safety Analytics and Issues Analysis

The NTSB recognizes the value of data to help us more strategically focus our resources on the most significant issues driving aviation safety. To that end, AS initiated a proof-of-concept project to evaluate ways to capitalize on the use of safety data sources and visualization techniques to improve our ability to focus on (1) investigation and remediation of the highest consequence safety issues contributing to accidents that are most relevant for the aviation industry and (2) proactive identification of trends and emerging aviation safety risks in both airline and GA operations. Staff will analyze aviation safety-related data from both internal and external sources to strategically identify emerging issues driving safety risk; issue areas for enhanced evidence documentation; factors supporting the scoping of safety recommendations and safety alerts; and effectiveness of our products, outreach, and advocacy. Such analytics could also help drive launch decision-making, training priorities for staff, and will provide data to support aviation-related inquiries from Congress and the public.

## Ongoing Significant Aviation Accident and Incident Investigations

Location	Date	Description	Fatalities
Lockhart, TX	07/30/2016	Balloon impact with power lines	16
Italy, TX	07/06/2016	Bell helicopter test flight and impact with terrain	2
Akron, OH	11/10/2015	Hawker 125 impact with apartment building	9
Fort Lauderdale, FL	10/29/2015	Fire during taxi for takeoff	0
Frisco, CO	07/03/2015	Airbus Helicopters AS350 crash in parking lot	1
Ketchikan, AK	06/25/2015	Sightseeing flight impact with terrain	9

Note: Accidents noted are those where significant resources are being devoted to the investigation and where it is anticipated a product such as an accident report or brief will be adopted.

## HIGHWAY SAFETY

<b>Highway Safety</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$7,471	30
FY 2018 Request	\$7,568	30
Increase/Decrease	\$97	0

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. No program changes are planned.

### Program Description

The Office of Highway Safety (HS) investigates accidents that have a significant effect on public confidence in highway transportation safety, highlight national safety issues, or generate high public interest and media attention. Such accidents may include collapses of highway bridge or tunnel structures, mass casualties and injuries on public transportation vehicles (such as motorcoaches and school buses), and collisions at highway–railroad grade crossings. We are also interested in accidents that involve new safety issues or technologies. HS conducts special studies based on trends emerging from NTSB accident investigations and from other research and accident data that identify common risks or underlying causes of accidents.

The NTSB is the only organization that performs independent, comprehensive, and transparent multidisciplinary investigations to determine the probable causes of highway accidents, with the goal of making recommendations to prevent similar accidents. Our investigations restore public confidence in the nation’s highway systems and provide policymakers with unbiased analysis.

HS comprises the Investigations Division and the Report Development Division.

### *Investigations Division*

The HS Investigations Division manages the multidisciplinary go-teams launched to accident sites to collect the factual and analytical information for investigations. Currently, major HS accident investigations are conducted by one of three teams, with six investigators on each team (for a total of 18 investigators). Each team is led by an IIC and includes five other investigators with expertise in vehicle, highway, human performance, survival, and motor carrier factors. To enhance geographic coverage and



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reduce response time, team members are located throughout the country, including in California, Colorado, Delaware, Massachusetts, Texas, Washington, and Washington, DC.

HS staff is also augmented by personnel from other NTSB offices who provide expertise in vehicle simulations, medical issues, occupant protection, fire science, metallurgy/materials, hazardous materials, statistical data analysis, video analysis, communications (accident notification), public/government/family affairs, legal issues, and recommendation follow-up.

### ***Report Development Division***

The HS Report Development Division manages the development of accident investigation reports. Project managers and writer-editors review the contents of the docket provided by the investigators for accuracy and completeness, research and develop national highway safety issues based on this information, and write and edit the report. This division is also responsible for managing public hearings and forums on national highway safety issues.

## **Accomplishments and Workload**

This office's accomplishments include issuance of a number of products related to transportation safety arising from completed and ongoing investigations. Products completed October 1, 2015 through September 30, 2016 are highlighted below, together with information on other efforts and focus areas important to both the current and future mission of the agency.

### ***Accident Reports***

Accident reports are issued for major accidents and are adopted by the Board.

#### **Commercial Truck Collision with Stopped Vehicles on Interstate 88 Naperville, Illinois January 27, 2014**

On January 27, 2014, a Freightliner truck-tractor in combination with a semitrailer, operated by DND International Inc., collided with stopped vehicles that were providing assistance to a disabled truck-tractor combination vehicle in the right lane of eastbound Interstate 88 near Naperville, Illinois. One of the stopped vehicles was a Highway Emergency Lane Patrol (HELP) truck, which was using an active yellow arrow board to direct traffic away from the area. An Illinois State Police patrol car also stopped and activated its flashing blue and red lights. As a result of the collision, the Illinois State Toll Highway Authority worker operating the HELP truck died. The Illinois State Police Trooper was seriously injured in a postcrash fire that completely consumed his patrol car, and the driver of the Freightliner combination vehicle was seriously injured.

The NTSB determined that the probable cause of the crash was the DND International Inc., driver's delayed response to the stopped vehicles ahead of him in the



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roadway because he was fatigued due to inadequate sleep. Contributing to the circumstances that resulted in the crash was the failure of DND International Inc., to ensure that its driver adhered to federal hours-of-service regulations. Also contributing to the crash was inadequate safety oversight by the Federal Motor Carrier Safety Administration (FMCSA).

The investigation focused on the safety issues of commercial driver fatigue and the inadequacy of FMCSA efforts to address the safety deficiencies for high-risk carriers or prioritize action to halt their operations. As a result of the investigation, the NTSB issued new safety recommendations and reiterated one safety recommendation to the FMCSA.

Recommendations: 4 new recommendations, 1 reiterated recommendation  
Report adopted: February 9, 2016

**Truck-Tractor Semitrailer Median Crossover Collision with Medium-Size Bus on Interstate 35  
Davis, Oklahoma  
September 26, 2014**

On September 26, 2014, a Peterbilt truck-tractor in combination with a semitrailer, operated by Quickway Transportation Inc., was traveling north on Interstate 35 near Davis, Oklahoma. About the same time, a 32-passenger medium-size bus—transporting 15 members of the North Central Texas College softball team—was traveling south on Interstate 35. After negotiating a slight rightward curve at a speed of about 72 mph, the truck-tractor departed the left lane and entered the 100-foot-wide earthen median. The truck-tractor continued through the median, traveling more than 1,100 feet without evidence of braking or steering. The combination vehicle then entered the southbound lanes of Interstate 35 and collided with the bus. After the impact, the bus rolled onto its right side, and the truck tractor continued off the roadway into a wooded area. Four passengers on the bus were fully or partially ejected and died, and both drivers and the remaining passengers were injured.

The NTSB determined that the probable cause of this crash was the failure of the truck-tractor driver to control his vehicle due to incapacitation likely stemming from his use of synthetic cannabinoids. Contributing to the severity of injuries were the lack of restraint use by the bus passengers and the lack of appropriate crashworthiness standards for medium-size buses.

The investigation identified the truck driver's drug use, passenger restraint systems, crashworthiness of medium-size buses, vehicle data recording, and median barriers as safety issues. The NTSB issued safety recommendations to the FMCSA; the NHTSA; the FHWA; the 50 states, the District of Columbia, and Puerto Rico; the American Trucking Associations, American Bus Association, United Motorcoach Association, Owner-Operator Independent Drivers Association, and Commercial Vehicle Safety Alliance; and the American Association of Community Colleges. In addition, the NTSB

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reiterated safety recommendations to NHTSA, the FHWA, and the American Association of State Highway and Transportation Officials.

Recommendations: 7 new recommendations, 9 reiterated recommendations  
Report adopted: November 17, 2015

### ***Accident Briefs***

Accident briefs are more limited with the primary purpose of determining probable cause. They may be adopted by the Office Director under delegated authority or may be adopted by the Board. Not all completed briefs are included here. There have been eight briefs completed to date in FY 2016.

#### **Bus Roadway Departure and Collision with Moving Train Penwell, Texas January 14, 2015**

On January 14, 2015, a Blue Bird prison bus was traveling westbound on Interstate 20 near Penwell, Texas, when it departed the roadway and collided with a moving train. The bus, operated by the Texas Department of Criminal Justice, was occupied by 12 inmates and 3 correctional officers (including the driver). At the time of the bus roadway departure, a Texas Department of Public Safety trooper was stopped on the right shoulder of Interstate 20 investigating a previous crash. The video camera in the trooper's patrol car captured a portion of the crash sequence. The bus was traveling in the left lane at an estimated speed of 57 mph. As the bus approached a two-lane bridge, it was positioned behind one truck-tractor semitrailer combination vehicle and alongside another combination vehicle. A section of W-beam guardrail, damaged in a previous crash, was partially intruding into the left lane. Although the bus driver applied the brakes momentarily, the bus struck this section of the guardrail and moved sharply to the left. The bus departed the left edge of the westbound roadway, overrode the previously damaged guardrail, entered the median, and became airborne between the westbound and eastbound parallel bridges. At the same time, a Union Pacific (UP) freight train was traveling southbound under the highway overpass. The bus fell about 20 feet onto an earthen area at the base of a concrete slope, on the east side of the railroad tracks, and continued forward, striking a railcar. The crash resulted in 10 fatalities: 2 correctional officers (including the driver) and 8 inmates. The remaining 5 bus occupants sustained serious injuries.

The NTSB determined that the probable cause of this crash was the bus loss of control due to striking a portion of damaged guardrail intruding into the left travel lane of Interstate 20 westbound. Contributing to the crash was the displaced and damaged condition of the guardrail due to multiple previous impacts by other vehicles in separate crashes, attributed to icy road conditions in the eastbound lanes.

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The investigation identified the snow and ice control procedures used by the Texas Department of Transportation as a safety issue. As such, the NTSB issued safety recommendations to the Texas Department of Transportation.

Recommendations: 2 new recommendations  
Brief adopted: April 21, 2016

**15-Passenger Van Roadway Departure and Overturn  
Lake City, Florida  
February 21, 2014**

On February 21, 2014, a Ford E-350 XLT Super Duty 15-passenger van was traveling northbound on Interstate 75 near Lake City, Florida. The van, operated by the First Baptist Church of New Port Richey, Florida, was transporting three adults and seven children, ranging in age from 11 to 16 years old, to a church camp in Covington, Georgia. During the trip, the driver of the van became concerned by a vibration he perceived to be coming from one of the vehicle's tires and pulled off the highway into a rest area to investigate. Finding nothing visibly wrong, he continued on the trip. After traveling an additional 13 miles on Interstate 75, the driver lost control of the vehicle when the left rear tire experienced a complete tire tread separation near US Route 90. The van moved to the right; departed the roadway onto a grassy, sloped embankment; and rolled 270 degrees about its longitudinal axis. During the rollover, the driver, one adult passenger, and two children were ejected from the vehicle. The two ejected adults died as a result of the crash. The remaining van occupants received injuries of varying severity. After the crash, it was determined that the left rear tire had been subject to a manufacturer-initiated recall.

The NTSB determined that the probable cause of this crash was the failure of the left rear tire due to a tread separation, which led to the loss of vehicle control. Contributing to the crash were the failure of the tire merchant to adhere to its training material and provide the purchaser with a tire registration form as required and record-keeping discrepancies that inadvertently allowed an outdated address to be used in the recall notification process. Contributing to the severity of the injuries was the nonuse of available seat belts.

The investigation identified deficiencies with Wal-Mart Stores Inc.'s tire registration processes, and the NTSB issued safety recommendations to Wal-Mart Stores, Inc. for improvement.

Recommendations: 2 new recommendations  
Brief adopted: October 27, 2015

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## *Special Investigations*

Special investigations usually involve analysis of data from multiple accidents centered around a common safety issue. Products of the special investigation process generally include a written report and stand-alone safety recommendations.

### **Selected Issues in Passenger Vehicle Tire Safety Special Investigation Report**

In February 2014, the NTSB investigated two fatal tire-related motor vehicle crashes in which the initiating event was tire tread separation. The first crash, which occurred in Centerville, Louisiana, involved a sport utility vehicle (SUV) and a school bus. The SUV was traveling westbound on US Highway 90 when its left rear tire experienced a tread separation and sudden air loss. The second crash, which occurred in Lake City, Florida, involved a 15-passenger van occupied by three adults and seven children. The van was traveling northbound on Interstate 75 when its left rear tire sustained a complete tread separation. The NTSB also conducted limited investigations in 2014 of two additional fatal crashes caused by tire failure—one involving a pickup truck that experienced a tread separation on its left front tire in Eloy, Arizona, and the other involving an SUV that experienced a tread separation on its right rear tire in Patterson, California. As a result of these crashes, 12 people died, and 42 people were injured.

On December 9 and 10, 2014, the NTSB hosted a Passenger Vehicle Tire Safety Symposium to learn more about the tire-related issues uncovered during its crash investigations and to gather additional information and expert opinion on the factors that lead to tire failure. Based upon investigative findings and the information gathered during the symposium, the NTSB identified several general areas of safety concern:

- Problems with the tire registration and safety recall system.
- Failure to establish the current level of crash risk posed by tire aging and lack of consumer guidance on the issue.
- Poor tire maintenance practices by consumers.
- Barriers to technological innovation that could prevent or mitigate tire-related crashes.

The special investigation report summarizes the NTSB's investigative efforts on tire-related passenger vehicle crashes, discusses the safety issues uncovered during these investigations and the December 2014 symposium, and makes recommendations to prevent or mitigate the severity of tire-related crashes. The special investigation report includes safety recommendations to the NHTSA, AAA, the Rubber Manufacturer's Association, and the major tire manufacturers.

Recommendations: 11 new recommendations  
Report adopted: October 27, 2015

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## *Safety Alerts*

Safety alerts are brief information sheets that pinpoint a particular safety issue. They contain information based on findings of investigations and enhance the dissemination of safety information to the traveling public.

### **The Impact of Oversize Loads on Our Nation's Bridges December 2015**

The NTSB issued this safety alert due to the recurring problem of commercial motor vehicle carriers transporting oversize loads on the nation's highways continuing to impact highway bridge structures. Many of these impacts often lead to catastrophic events that result in fatalities and injuries, as well as enormous cost to repair the bridge structures. The safety alert discusses the importance of preplanning the route and acquiring a permit prior to travel.

## *Forums/Symposiums*

A forum or symposium is a public proceeding focused on a specific topic where invited participants provide presentations and are available for questions.

### **Pedestrian Safety Forum May 10, 2016**

The NTSB held a 1-day forum to discuss ways to improve pedestrian safety. The forum was organized around four panels, each addressing distinct aspects of pedestrian safety. The first panel looked at recent trends and underlying effects of the safety risks for walking across or along public roads, including efforts to quantify exposure of pedestrians to the risk of being struck by a moving vehicle and the data needed to develop effective pedestrian safety plans. The second panel looked at federal, state, and local urban planning and policy as it relates to pedestrian safety. The third panel considered highway design countermeasures to improve pedestrian safety, including infrastructure cost and funding. The fourth panel looked at vehicle-based solutions to improve pedestrian safety, including collision avoidance and vehicle-detection technology being deployed in current and future model vehicles.

## *Other Efforts and Focus Areas*

### **Rear Seat Safety in Passenger Vehicles Workshop April 26, 2016**

The NTSB held a 1-day invitational workshop to discuss ways to improve the safety of occupants in the rear seats of passenger vehicles. The workshop was organized around opening presentations, two breakout sessions, and a final summary session. Topics during the sessions addressed various aspects of rear seat safety in passenger vehicles, such as current requirements for rear occupant protection, research on ways to improve rear seat safety, vehicle technologies available now to reduce injuries and fatalities, and courses of

action industry has undertaken to address rear seat safety in passenger vehicles. The workshop also explored ways for the NTSB to become involved in the improvement of rear seat safety in passenger vehicles and augment the NTSB’s MWL Occupant Protection Advocacy efforts.

## Ongoing Significant Highway Accident Investigations

Location	Date	Description	Fatalities
Livingston, CA	08/02/2016	A motorcoach departed the roadway and collided with a roadside signpost.	5
St. Marks, FL	07/02/2016	A school bus used to transport migrant workers entered an intersection in front of a combination vehicle traveling on the cross street.	4
Goodland, KS	06/29/2016	A truck tractor in combination with a van semitrailer collided with the rear of a Toyota SUV.	5
Ruther Glen, VA	06/18/2016	A 1998 Dodge van departed northbound I-95, attempted to return to the roadway, stuck another vehicle, and overturned.	6
Cooper Township, MI	06/07/2016	A pickup truck struck a group of nine bicyclists.	5
Laredo, TX	05/14/2016	A motorcoach, traveling through a curve in wet weather yawed and rolled over.	9
Williston, FL	05/07/2016	A Tesla passenger vehicle operated in autonomous mode collided with a truck-tractor combination at an intersection.	1
Boston, MA	04/30/2016	A motor scooter was involved in a collision with an amphibious Duck Tour vehicle.	1
Robstown, TX	03/20/2016	A passenger vehicle crossed a median and collided with a commercial motor vehicle.	3
Stroud, AL	03/11/2016	A tanker truck transporting liquid propane experienced a tire failure resulting in the vehicle jack-knifing. The cargo tank collided with a rock and exploded.	0
San Jose, CA	01/19/2016	A motorcoach collided with a crash attenuator.	2
Little Rock, AK	11/06/2015	A motorcoach ran off the road and collided with a concrete bridge pillar.	6
Stillwater, OK	10/24/2015	A passenger vehicle ran into pedestrians participating in a college homecoming parade.	3
Seattle, WA	09/24/2015	A Ride the Duck amphibious vehicle departed its northbound travel lane and collided with a motorcoach proceeding southbound.	5
Houston, TX	09/15/2015	A passenger vehicle collided with the left front of a school bus. The school bus deviated to the right and drove through a bridge rail, impacting the road below.	2
Chattanooga, TN	06/25/2015	A truck-tractor combination collided with traffic slowed in an active work zone.	6
Anaheim, CA	04/24/2015	A school bus departed the roadway and collided with two trees.	0

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<b>Location</b>	<b>Date</b>	<b>Description</b>	<b>Fatalities</b>
Oxnard, CA	02/24/2015	A Metrolink commuter train struck a truck towing a trailer at an active highway-railroad grade crossing.	1

Note: Accidents noted are those where significant resources are being devoted to the investigation and where it is anticipated a product such as an accident report or brief will be adopted.

## MARINE SAFETY

<b>Marine Safety</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$4,897	20
FY 2018 Request	\$4,962	20
Increase/Decrease	\$65	0

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. No program changes are planned.

### Program Description

The Office of Marine Safety (MS) investigates and determines the probable cause of major marine accidents in US territorial waters, major marine accidents involving US-flagged merchant vessels worldwide, and accidents involving both US public and nonpublic vessels in the same casualty. In addition, the office investigates select catastrophic marine accidents or those of a recurring nature.

The USCG conducts preliminary investigations of all marine accidents and notifies the NTSB if an accident qualifies as a major marine casualty. An accident is classified as a major marine casualty if the accident results in any one of the following:

- The loss of six or more lives.
- The loss of a mechanically propelled vessel of 100 or more gross tons.
- Property damage initially estimated as \$500,000 or more.
- A serious threat, as determined by the USCG Commandant and concurred in by the NTSB Chairman, to life, property, or the environment by hazardous materials.

For select major marine casualties, the office launches a full investigative team and presents the investigative product to the Board. For all other major marine casualties, MS launches a field team of marine investigators to the scene to gather sufficient factual information to develop a marine accident brief. Most of these brief investigation reports are adopted by the MS Director through delegated authority; briefs involving public/nonpublic marine accidents are adopted by the Board.

MS is also responsible for the overall management of the NTSB international marine safety program, under which the NTSB investigates major marine casualties involving foreign-flagged vessels in US territorial waters and those involving US-flagged vessels anywhere in the world. Accidents involving foreign-flagged vessels accounted for



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23 percent of NTSB marine accident investigations during the past 5 years. Under the International Maritime Organization (IMO) Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), MS also participates with the USCG as a substantially interested state in investigations of serious marine casualties involving foreign-flagged vessels in international waters. For example, NTSB often participates in accident investigations that involve foreign-flagged cruise ships with US citizens on board. Every year, more than 11 million US citizens travel on board foreign-flagged cruise ships.

The MS international program involves reviewing US administration position papers related to marine accident investigations and participating in select IMO meetings. During the last year, MS staff attended IMO meetings covering topics such as the review and classification of maritime accidents and accident reporting, the certification and training of mariners, and the technical standards and requirements for voyage data recorders.

As part of the international program, MS coordinates with other US and foreign agencies to ensure consistency with IMO conventions, most notably for joint US/flag-state marine accident investigations. MS also cooperates with other accident investigation organizations worldwide, such as the Marine Accident Investigators' International Forum, and tracks developments related to marine accident investigations and prevention.

The NTSB is the only federal organization that performs independent, comprehensive, and transparent multidisciplinary investigations to determine the probable cause of marine accidents, with the goal of making recommendations to prevent similar accidents. The thoroughness and independence of MS's investigations maintain public confidence in marine transportation systems and provide policymakers with unbiased analysis.

MS comprises the Office of the Director, the Major Investigations Division, and the Product Development Division.

### ***Major Investigations Division***

The Major Investigations Division manages the multidisciplinary go-teams that launch to accident sites, collect factual information, and analyze collected information to determine probable cause. Currently, major accident investigations are conducted by one of two teams with six investigators on each team, for a total of 12 investigators. Each team is led by an IIC and includes subject-matter experts in nautical operations, marine engineering and naval architecture, survival factors, and human performance.

### ***Product Development Division***

The Product Development Division administers the investigative quality management program. The division consists of technical writer-editors who are responsible for drafting and editing major marine accident reports, marine accident briefs, safety recommendation letters, special investigation reports, MS's annual *Safer Seas Digest*

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publication, responses to notices of proposed rulemaking, and general correspondence. Staff also reviews the contents of the accident dockets provided by investigative specialists.

## Accomplishments and Workload

This office's accomplishments include the issuance of a number of products related to transportation safety arising from completed and ongoing investigations. Products completed October 1, 2015 through September 30, 2016 are highlighted below, together with information on other efforts and focus areas important to both the current and future mission of the agency.

### *Accident Reports*

Accident reports are issued for major accidents and are adopted by the Board.

#### **Collision between Bulk Carrier *Conti Peridot* and Tanker *Carla Maersk* Houston Ship Channel near Morgan's Point, Texas March 9, 2015**

On March 9, 2015, the inbound bulk carrier *Conti Peridot* collided with the outbound tanker *Carla Maersk* in the Houston Ship Channel near Morgan's Point, Texas. The collision occurred in restricted visibility after the pilot on the *Conti Peridot* was unable to control the heading fluctuations that the bulk carrier was experiencing during the transit. As a result, the *Conti Peridot* crossed the channel into the path of the *Carla Maersk*. No one on board either ship was injured in the collision, but an estimated 2,100 barrels (88,200 gallons) of methyl tert-butyl ether spilled from the *Carla Maersk*, and the two vessels sustained about \$8.2 million in total damage.

The NTSB determined that the probable cause of the collision was the inability of the pilot on the *Conti Peridot* to respond appropriately to hydrodynamic forces after meeting another vessel during restricted visibility and his lack of communication with other vessels about this handling difficulty. Contributing to the circumstances that resulted in the collision was the inadequate bridge resource management between the master and the pilot on the *Conti Peridot*.

Safety issues identified in this accident included inadequate bridge resource management, insufficient pilot communications, and lack of predetermined ship movement strategies during restricted visibility in the Houston Ship Channel. As a result of this investigation, the NTSB issued safety recommendations to the *Conti Peridot* operating company, the pilots association, and the local harbor safety committee.

Recommendations: 3 new  
Report Adopted: June 20, 2016

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**Collision between the *Riley Elizabeth* Tow and US Army Corps of Engineers Barge Plant  
Mississippi River near Waterproof, Louisiana  
July 18, 2014**

On July 18, 2014, the towing vessel *Riley Elizabeth* was pushing 30 barges on the Mississippi River at Kempe Bend, near Waterproof, Louisiana, when the vessel and two of its barges collided with a US Army Corps of Engineers (Corps of Engineers) barge plant conducting a revetment project. No one was injured in the accident; however, the collision resulted in an estimated \$100,000 in damage to the *Riley Elizabeth* and two of its barges and \$200,000 in damage to the barge plant.

The NTSB determined that the probable cause of the collision was the incomplete information provided by the Corps of Engineers about the extent of the obstruction in the waterway and the failure of the *Riley Elizabeth* mate to determine the extent of the obstruction before starting the turn at Kempe Bend.

Safety issues identified in this accident include incomplete information to mariners about waterway obstructions and the need for expanded use of automatic identification system features to mark waterway obstructions. As a result of this investigation, the NTSB issued safety recommendations to the Corps of Engineers.

Recommendations: 2 new  
Report Adopted: December 16, 2015

### ***Accident Briefs***

Accident briefs are developed from field investigations and are limited in scope with the primary purpose of determining probable cause. They may be adopted by the Office Director under delegated authority or may be adopted by the Board. There were 24 briefs completed in FY 2016.

**Grounding of the Fish-Processing Vessel *Gordon Jensen*  
Bella Bella, British Columbia, Canada  
December 19, 2015**

On December 19, 2015, the US-flag fish-processing vessel *Gordon Jensen*, en route from Seattle, Washington, to Dutch Harbor, Alaska, grounded in Canadian waters near the town of Bella Bella, British Columbia, about 250 nautical miles (nm) northwest of Vancouver, Canada. As a result of the grounding, the forward-most portside ballast tank was breached, costing \$583,376 in repairs. There were 165 persons aboard the vessel. No injuries or pollution were reported.

The NTSB determined that the probable cause of the grounding of the *Gordon Jensen* was the combined effects of prescription pain medication, over-the-counter cold medication, alcohol, and sleep deprivation, which led to the master's impaired cognitive

performance, preventing him from recognizing that he could not effectively perform the duties and responsibilities of master.

Recommendations: None  
Brief Adopted: September 29, 2016

**Collision and Sinking of Towing Vessel *Miss Natalie*  
Lower Mississippi River, Romeville, Louisiana  
May 30, 2015**

On May 30, 2015, the uninspected towing vessel *Miss Natalie* collided with the tow of the uninspected towing vessel *George W Banta* while the *Miss Natalie* was attempting to remove one of the tow's barges. Shortly afterward, the *Miss Natalie* capsized and sank on the Lower Mississippi River in Romeville, Louisiana. Four of the five crewmembers escaped, but one deckhand died. The vessel sustained an estimated \$1.8 million in damages rendering it a constructive total loss. No pollution was reported.

The NTSB determined that the probable cause of the sinking of the *Miss Natalie* was its captain's decision to downstream on a line-haul tow given the prevailing conditions. Contributing to the sinking was the *George W Banta* tow moving ahead as the *Miss Natalie* approached rather than holding its position in the river.

Recommendations: None  
Brief Adopted: September 20, 2016

**Allision of Barge *Gayle Force*, Under Tow by Tugboat *Simone*, with Norfolk  
Southern Bridge #7  
Chesapeake, Virginia  
April 26, 2015**

On April 26, 2015, the barge *Gayle Force* struck the unmanned Norfolk Southern Railway Bridge #7 on the Southern Branch of the Elizabeth River in Chesapeake, Virginia, while being towed by the tugboat *Simone*. The allision caused \$1.8 million in damage to the bridge and stopped rail traffic for nearly 36 hours. Damage to the barge was negligible. No one was injured, and there was no pollution associated with the accident.

The NTSB determined that the probable cause of the allision of the barge *Gayle Force* with the Norfolk Southern Bridge #7 was the *Simone* captain's failure to plan for the bridge transit and effectively use the assist tugboat.

Recommendations: None  
Brief Adopted: September 14, 2016

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**Sinking of the Fishing Vessel *Capt Richie Rich*  
10 nautical miles southwest of Point au Fer, Louisiana  
August 30, 2015**

On August 30, 2015, the uninspected fishing vessel *Capt Richie Rich* was under way and trawling for shrimp in coastal waters about 10 nm southwest of Point au Fer, Louisiana, when the port outrigger broke and holed the vessel's hull. The breach allowed water to enter the engine room, causing the vessel to list to starboard. It later sank partially in 12 feet of water. The three crewmembers, who abandoned the vessel into a liferaft, were rescued by the USCG; no one was injured. An oil sheen was observed in the area where the vessel sank.

The NTSB determined that the probable cause of the sinking of the *Capt Richie Rich* was a collapse of the port outrigger and a hull penetration resulting in uncontrolled flooding in the engine room.

Recommendations: None  
Brief Adopted: August 17, 2016

**Sinking of Deck Barge *Margaret*  
Mississippi River, near Convent, Louisiana  
August 31, 2015**

The deck barge *Margaret*, which was anchored at a fleeting area at mile marker (mm) 159.5 near Convent, Louisiana, began taking on water at an increasing rate during the night shift of August 30–31, 2015. A production manager, who was making inspection rounds every 2 hours, tried to increase the barge's dewatering capacity to stem the flooding, but the *Margaret* listed heavily to port and sank moments later. No injuries were reported. A light sheen of suspected diesel oil was noted at the incident location. The barge owner estimated the loss at \$2 million.

The NTSB determined that the probable cause of the sinking of the *Margaret* was flooding of the port stern void due to the barge's overall lack of maintenance and watertight integrity. Contributing to the sinking was the barge company's lack of formal reporting procedures for its production managers conducting inspection rounds of the barges.

Recommendations: None  
Brief Adopted: August 17, 2016

**Fire on board Fishing Vessel *Northern Pride*, with Subsequent Capsizing  
Gulf of Alaska 12 miles east of Shuyak Island, Alaska  
April 21, 2015**

On April 21, 2015, a fire broke out in the forepeak machinery space on the uninspected fishing vessel *Northern Pride* while under way in the vicinity of Portlock Bank, Alaska. Smoke and fire spread quickly to the main cabin and wheelhouse, prompting the captain to broadcast a Mayday alert. The captain then ordered his crew to

don their immersion suits and abandon ship into the vessel's inflatable liferaft. A USCG helicopter responding to the emergency hoisted the crew aboard and transported them to Kodiak, Alaska. Shortly after the rescue, the *Northern Pride* capsized. The overturned vessel drifted northwest towards the Shakun Islets, and, on May 7, its splintered hull washed ashore at Cape Chiniak within Katmai National Park. About 5,440 gallons of fuel, hydraulic, and lubricating oil were released to the sea. No injuries were reported. The vessel was declared a total loss valued at an estimated \$425,000.

The NTSB determined that the probable cause of the loss of the *Northern Pride* was a fire in the forepeak machinery space and flooding through the hull planking, which led to its capsizing. Contributing to the accident were the overall poor condition and maintenance of the vessel and the captain's decision to get under way in a vessel with known deficiencies. Also contributing to the accident was the rapid spread of the fire in the wooden vessel due to the absence of machinery space fire-suppression systems and fire-protected subdivision bulkheads, neither of which were required for uninspected fishing vessels.

Recommendations: None  
Brief Adopted: August 12, 2016

**Collision between Towing Vessel *William E Strait* and *Margaret Ann*  
Lower Mississippi River near Memphis, Tennessee  
December 14, 2015**

On December 14, 2015, the uninspected towing vessel *Margaret Ann* was downbound on the Mississippi River pushing 3 tank barges loaded with liquid asphalt when its tow collided with the uninspected towing vessel *William E Strait*, which was pushing a flotilla of 30 loaded gravel barges. The *William E Strait* partially sank on the left descending bank of the river. There were no reported injuries.

The NTSB determined that the probable cause of the collision was the *William E Strait* pilot's inability to hold his vessel in position along the left descending bank, as had been agreed on, to allow the safe and unimpeded passage of the *Margaret Ann*.

Recommendations: None  
Brief Adopted: August 12, 2016

**Collision of Articulated Tug and Barge *Lucia/Caribbean*, Assisted by Tugboat  
*William S*, with Multiple Barges  
Mississippi River near New Orleans, Louisiana  
January 15, 2016**

On January 15, 2016, the articulated tug and barge (ATB) *Lucia/Caribbean* collided with multiple barges at the Stone Oil Distributor facility on the right descending bank of the Mississippi River near mm 96.5 in Gretna, Louisiana. At the time, the ATB was attempting to maneuver into position for a downbound transit with the assistance of the tugboat *William S*. As a result of the accident, tank barge *Caribbean*'s port bow was holed,

forward and above the waterline. The facility also sustained damage—specifically, the dock structure, one dock barge, and four tank barges. A downriver passenger ferry was also damaged. No injuries were reported.

The NTSB determined that the probable cause of the collision was the decision by the mate on the *William S* to not fully execute the navigational commands provided to him.

Recommendations: None  
Brief Adopted: August 9, 2016

**Collision between USCG Cutter *Key Largo* and Fishing Vessel *Sea Shepherd*, with subsequent sinking of *Sea Shepherd*  
Virgin Passage, 9 miles east-northeast of Vieques Island, Puerto Rico  
September 23, 2014**

On September 23, 2014, the 110-foot-long USCG Cutter *Key Largo* collided with the 42-foot-long fishing vessel *Sea Shepherd* in the Virgin Passage, about 9 miles east-northeast of Vieques Island, Puerto Rico. Just before the collision, the two *Sea Shepherd* crewmembers, who were hauling lobster traps on board, jumped in the water. No one was injured. The *Key Largo* sustained minor damage; the *Sea Shepherd* sank about 2 hours after the collision.

The NTSB determined that the probable cause of the collision was the failure of the cutter’s officer of the deck to detect and avoid the *Sea Shepherd*, most likely because he had fallen asleep prior to the accident. Contributing to the collision was the officer of the deck’s failure to report to the commanding officer his unfitness for duty due to lack of sleep.

Safety issues identified included poor watchkeeping practices on board the *Key Largo* and the failure to implement the USCG’s Crew Endurance Management program throughout all of the service’s operational units. As a result of this investigation, the NTSB issued a safety recommendation to the USCG to address the risks associated with watchstander fatigue by implementing *Commandant Instruction 3500.2, Crew Endurance Management*, issued on March 30, 2006, in all operational units.

Recommendations: 1 new  
Brief Adopted: July 11, 2016

**Capsizing and Sinking of the Fishing Vessel *Hawaii Five-1*  
161 miles northeast of Cozumel, Mexico  
November 25, 2015**

On November 25, 2015, the uninspected fishing vessel *Hawaii Five-1*, en route to Honolulu, Hawaii, from Bayou La Batre, Alabama, capsized and subsequently sank in the Gulf of Mexico just north of the Straits of Yucatan. The two crewmembers, a captain and a deckhand, managed to board a liferaft and were rescued by the USCG later that night. The crew reported minor injuries associated with the accident.



The NTSB determined that the probable cause of the capsizing and sinking of fishing vessel *Hawaii Five-1* was inadequate intact stability due to the owners' failure to determine and mitigate the impacts that the conversion to longline fisheries services had on the vessel's overall stability. Contributing to the loss of the vessel was the master's insufficient understanding of stability principles, as demonstrated by his lack of action to improve the vessel's stability during adverse sea conditions and his failure to maintain watertight integrity.

Recommendations: None  
Brief Adopted: June 30, 2016

**Collision between Containerships *St. Louis Express* and *Hammersmith Bridge*  
Western Scheldt River, near Hansweert, Netherlands  
February 25, 2015**

On February 22, 2015, the US-flagged containership *St. Louis Express* and the Panama-flagged containership *Hammersmith Bridge* collided while meeting on the Scheldt River, west of Antwerp, Belgium. The *St. Louis Express* was outbound from Antwerp heading to its next scheduled port of Bremerhaven, Germany, while the *Hammersmith Bridge* was inbound to Antwerp. The accident resulted in combined vessel damages greater than \$500,000. There were no reports of injuries or environmental pollution.

The NTSB determined that the probable cause of the collision was the failure of the pilots and bridge teams on both vessels to assess the risk of collision, inadequate bridge resource management on both vessels, and a lack of communication between the pilots. Contributing to the accident was the failure to establish adequate passing room between the vessels while meeting near a major bend in a narrow channel.

Recommendations: None  
Brief Adopted: June 30, 2016

**Breakaway of Bulk Carrier *Privocean* and Subsequent Collision with Tanker *Bravo*  
and Tugboat *Texas*  
Near Convent, Louisiana  
April 6, 2015**

On April 6, 2015, the bulk carrier *Privocean* broke free from its moorings at Convent Marine Terminal, located at mm 161 on the Lower Mississippi River, during high water conditions. The ship drifted across the river and collided with the tanker *Bravo*, moored at the Ergon-St. James Terminal. Tugboat *Texas*, which had been assisting the *Privocean*, was pinned between the ships as they collided. All three vessels, the dock at the terminal, and deck equipment on three other tugboats sustained damage totaling about \$11 million. About 10 barrels of fuel oil spilled into the river, and four crewmembers aboard the *Texas* sustained minor injuries.



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The NTSB determined that the probable cause of the collision was the inadequate mooring arrangement for the *Privocean* and the insufficient number of hold-in tugs provided by the vessel operator given the prevailing conditions.

Recommendations: None  
Brief Adopted: June 29, 2016

**Collision between Passenger Vessel *Diamond Edge* and Liftboat *B. W. Haley*  
Freshwater Bayou Safety Fairway, Gulf of Mexico  
March 2, 2015**

On March 2, 2015, the passenger vessel *Diamond Edge* and the liftboat-configured offshore supply vessel *B. W. Haley* collided while under way in dense fog about 55 miles south-southwest of Lafayette, Louisiana. As a result of the collision, the hull of the *Diamond Edge* was breached, and the vessel partially sank. There were no significant injuries or pollution reported. Estimated damage exceeded \$1.75 million for both vessels combined.

The NTSB determined that the probable cause of the collision was the failure of both operators to properly determine the risk of collision and the excessive speed of the *Diamond Edge* in restricted visibility.

Recommendations: None  
Brief Adopted: June 13, 2016

**Collision between the Tows of Towing Vessels *Capt. Shorty C* and *Jackie*  
Gulf Intracoastal Waterway, mm 349.5, Port Bolivar, Texas  
July 20, 2015**

On July 20, 2015, the lead barge of the uninspected towing vessel *Capt. Shorty C* collided with the tow of the uninspected towing vessel *Jackie* at the entrance to the Gulf Intracoastal Waterway at Port Bolivar, Texas, causing a fire on the aft barge of the *Jackie*'s tow. Neither towboat was damaged, but three barges sustained an estimated total of \$608,000 in damages. No pollution or injuries were reported.

The NTSB determined that the probable cause of the collision was the operators' attempt to meet in a location known for strong currents and shoaling, which was contrary to published guidance for that waterway.

Recommendations: None  
Brief Adopted: April 28, 2016

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**Collision between Tanker *Chembulk Houston* and Containership *Monte Alegre*  
Houston Ship Channel, Galveston Bay, Houston, Texas  
March 5, 2015**

On March 5, 2015, the tanker *Chembulk Houston* and the containership *Monte Alegre* collided and grounded in the Houston Ship Channel after the pilots agreed to let the *Chembulk Houston* overtake the *Monte Alegre*. Both ships were inbound in the channel. No injuries or pollution resulted from the accident, but both vessels sustained damage above their waterlines, totaling more than \$1.7 million.

The NTSB determined that the probable cause of the collision was the pilot's decision to increase speed on the *Monte Alegre* without informing the deputy pilot on the overtaking *Chembulk Houston*.

Recommendations: None  
Brief Adopted: February 23, 2016

**Allision of Offshore Supply Vessel *Connor Bordelon* with Unmanned Platform South  
Timbalier 271A  
About 5.25 miles south of Port Fourchon, Louisiana, jetty channel entrance  
January 23, 2015**

On January 23, 2015, the offshore supply vessel *Connor Bordelon* struck the unmanned natural gas platform South Timbalier 271A, which was located about 5.25 miles south of the jetty channel entrance at the vessel's home port of Port Fourchon, Louisiana. The allision caused the pipelines attached to the platform to rupture and natural gas and oil inside the pipelines to ignite. After the allision, the pipelines were shut down, and three Good Samaritan vessels in the area applied water to put out the fire. The allision also caused a breach in the *Connor Bordelon*'s hull below the waterline, and the vessel began taking on water. The captain contacted the USCG to report the accident, and the USCG released the *Connor Bordelon* from the accident area and allowed it to continue to Port Fourchon while the crew addressed the flooding. None of the 24 persons on board the vessel were injured.

The NTSB determined that the probable cause of the allision was the failure of the mate on watch to ensure that the bridge team maintained a proper lookout and his delay in changing from the autopilot to manual steering, which precluded him from taking the necessary action to prevent the allision with the platform.

Recommendations: None  
Brief Adopted: February 12, 2016

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**Grounding of Commercial Fishing Vessel *SeaHawk No. 68*  
Pala Lagoon, Pago Pago, American Samoa  
April 22, 2015**

About 0530 local time on May 22, 2015, the Taiwan-flagged commercial fishing vessel *SeaHawk No. 68* ran aground on a reef at the entrance to Pala Lagoon, Tutuila Island, American Samoa. All 22 crewmembers abandoned the vessel after the grounding and boarded the vessel's liferaft, which then floated to the shore. Some crewmembers sustained minor injuries during their egress from the vessel. No pollution was reported. The vessel was declared a constructive total loss.

The NTSB determined that the probable cause of the grounding of the *SeaHawk No. 68* was the captain's failure to effectively monitor the vessel's position and progress as well as provide specific watch standing instructions. Contributing to this accident was the owner/operator's lack of policies and procedures for navigation and training of vessel crewmembers.

Recommendations: None  
Brief Adopted: February 11, 2016

**Engine Room Fire on Board Commercial Fishing Vessel *Miss Eva*, with Subsequent Sinking  
Gulf of Mexico, Ship Shoal Block 154  
December 1, 2014**

On December 1, 2014, a fire broke out in the engine room of the commercial fishing vessel *Miss Eva*. The master and three crewmembers abandoned ship and were rescued by the offshore supply vessel *Dustin Danos*. Two USCG helicopters transported the crewmembers ashore for medical treatment. The vessel and the 35,000 pounds of shrimp it was transporting were considered a total loss. At the time of the accident, the *Miss Eva* had an estimated 3,200 gallons of marine diesel fuel and 100 gallons of hydraulic oil on board. No sheen was reported.

The NTSB determined that the probable cause of the accident was an engine room fire that began from an undetermined source followed by downflooding and the eventual sinking of the vessel.

Recommendations: None  
Brief Adopted: January 14, 2016

**Collision of Bulk Carrier *Flag Gangos* with Oil Tanker *Pamisos* and Floating Pier  
Mississippi River, Gretna, Louisiana  
August 12, 2014**

On August 12, 2014, the outbound bulk carrier *Flag Gangos* collided with the berthed oil tanker *Pamisos* on the Mississippi River at Gretna, Louisiana. The *Flag Gangos* subsequently allided with a pier at the facility where the *Pamisos* was berthed, and the pier

struck and damaged a fuel barge, *WEB235*, berthed behind the *Pamisos*. No one was injured, but about 1,200 gallons of oil that was being transferred at the time spilled from the transfer lines, and some of the oil entered the river. Damage amounts were reported as \$16 million for the terminal, more than \$500,000 each for the *Flag Gangos* and the *Pamisos*, and about \$418,000 for the fuel barge.

The NTSB determined that the probable cause of the accident was the delay by the *Flag Gangos*' operating company in completing a mandatory upgrade to the vessel's steering system and failure to routinely test the steering system's hydraulic fluid for debris as required by the manufacturer. Contributing was the failure of the steering system manufacturer to schedule and complete the mandatory upgrade.

Recommendations: None  
Brief Adopted: December 22, 2015

**Grounding and Sinking of Commercial Fishing Vessel *Titan*  
Jetty A off Cape Disappointment, Ilwaco, Washington  
December 5, 2014**

On December 5, 2014, the commercial fishing vessel *Titan* was proceeding outbound on the Columbia River when it grounded at the southern end of Jetty A off Cape Disappointment, Ilwaco, Washington. The vessel sustained hull damage and began to flood. Efforts to dewater the *Titan* were unsuccessful, and the five crewmembers abandoned the vessel after a USCG motor lifeboat arrived on scene. The *Titan* remained partially afloat by the stern and sank the next day. None of the *Titan*'s five crewmembers were injured. The *Titan* and its catch, an estimated 40,000 pounds of Dungeness crab, were declared a total loss. The vessel had an estimated 3,500 gallons of diesel oil, 700 gallons of hydraulic oil, and 400 gallons of lube oil on board. Oil sheens were sighted after the vessel sank. The vessel was not salvaged or recovered.

The NTSB determined that the probable cause of the grounding and subsequent sinking of the *Titan* was the failure of the captain to monitor the vessel's track as a result of falling asleep due to an accumulated sleep deficit after 4 days of continuous operations and the vessel owners' lack of measures to mitigate crewmember fatigue. Contributing to the accident was the nature of the derby-style Dungeness fishery in the states of Washington and Oregon, which results in continuous fishing operations at the beginning of the season.

Recommendations: None  
Brief Adopted: December 21, 2015

**Engine Room Fire on Board Towing Vessel *Dennis Hendrix*  
Lower Mississippi River, about 10 miles northwest of Baton Rouge, Louisiana  
October 31, 2014**

On October 31, 2014, the uninspected towing vessel *Dennis Hendrix* was transiting upbound on the Lower Mississippi River while pushing 24 loaded barges when a fire broke

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out in the engine room. Crewmembers began to fight the fire, and other vessels in the area provided firefighting and towing assistance. The fire burned until mid-afternoon. None of the 10 crewmembers were injured, and no environmental damage was reported. The damage to the *Dennis Hendrix* was estimated at \$3.8 million.

The NTSB determined that the probable cause of the engine room fire on board the *Dennis Hendrix* was a catastrophic failure of the starboard main engine resulting from loose bolts on the no. 5 cylinder rod cap while the engine was operating at a high load condition.

Recommendations: None  
Brief Adopted: November 9, 2015

**Grounding of Commercial Fishing Vessel *Savannah Ray*  
Long Island, Alaska  
February 15, 2015**

On February 16, 2015, the commercial fishing vessel *Savannah Ray* grounded on the lee shore of Long Island, Alaska, while traveling in rough seas from fishing grounds off Ugak Island in the Gulf of Alaska to the vessel's home port at St. Paul Harbor, Kodiak Island, Alaska. The vessel then washed up on the beach about 5 miles from St. Paul Harbor. The four crewmembers were rescued from the vessel by a helicopter from USCG Air Station Kodiak. The insured value of the *Savannah Ray* was \$800,000, and the vessel was deemed a constructive total loss as a result of the grounding.

The NTSB determined that the probable cause of the grounding of the *Savannah Ray* was the vessel straying off course and entering shallow water because the captain fell asleep while navigating due to fatigue. Contributing to the grounding was the captain's failure to use all of the vessel's available alerting and navigation alarms.

Recommendations: None  
Brief Adopted: November 5, 2015

**Grounding and Subsequent Breakup of Dive Vessel *King Neptune*  
Avalon Harbor, Catalina Island, California  
December 30, 2014**

On December 30, 2014, in severe weather conditions, the 62-foot-long dive vessel *King Neptune* broke loose from its moorings in Avalon Harbor, Catalina Island, California. At the time, no one was on board. A harbor patrol officer, who later jumped on board the vessel to try to move it to a safe mooring location, died after falling into the water and becoming pinned between the vessel and a seawall. Under continuous wave action, the *King Neptune* broke apart and subsequently sank.

The NTSB determined that the probable cause of the breakup and subsequent sinking of the *King Neptune* was the failure of the vessel's mooring equipment in severe weather conditions and the Avalon Harbor Department's inability to prevent the vessel from drifting ashore. Contributing to the death of the patrol officer who jumped on board

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was the Avalon Harbor Department’s decision to allow personnel to board a drifting vessel in severe weather conditions without a plan for communication and retrieval.

Recommendations: None  
Brief Adopted: October 27, 2015

**Sinking of Fishing Vessel *Blazer*  
Pacific Ocean, about 8 miles west of Siletz Bay, Oregon  
November 29, 2014**

On November 29, 2014, the 73-foot-long fishing vessel *Blazer*, loaded with Dungeness crab pots, sank in the Pacific Ocean about 8 miles west of Siletz Bay, Oregon. All five crewmembers abandoned ship and were rescued by the USCG. The *Blazer*, valued at \$950,000, sank with 2,000 gallons of diesel fuel and mixed lube oil products on board. No pollution was sighted.

The NTSB determined that the probable cause of the sinking of the *Blazer* was flooding from an unknown point of ingress.

Recommendations: None  
Brief Adopted: October 6, 2015

## Other Efforts and Focus Areas

***Safer Seas Digest 2015*  
Published August, 17, 2016**

*Safer Seas Digest 2015* is the third edition of this publication, a “one-stop shop” for mariners and others to review concise summaries of a full year’s accident investigations. The yearly digests are used in crew training and safety meetings both on board and shoreside. *Safer Seas Digest 2015* represents NTSB’s continuing commitment to sharing lessons learned through investigations.

### ***Support to Foreign Accident Investigations***

Since October 1, 2015, MS participated with the USCG as a substantially interested state in the following completed investigations of serious marine casualties involving foreign-flagged vessels in international waters (the NTSB submitted comments to draft reports from the flag states; however, final flag state investigation reports have not been received in all cases):

Location	Date	Description*	Fatalities	Close-out Date
South Atlantic Ocean IVO Falkland Islands, United Kingdom (UK)	11/18/2015	On the P/V <i>Le Boreal</i> (France), a diesel engine set fire. Passengers and most of crew were instructed to abandon ship to liferaft and were rescued by UK Royal Navy. France is the lead investigation state. USCG and NTSB assisted.	0	08/4/2016
Pacific Ocean, about 6½ nm northwest of Playa Herradura, Costa Rica	01/08/2015	P/V <i>Ecoquest (ex Pura Vida Princess)</i> (Costa Rica) sunk about 6½ nm northwest of Playa Herradura, Costa Rica. Pacific Ocean. USCG and NTSB assisted.	3	07/8/2016
Freeport Harbor, Grand Bahama, Bahamas	10/31/2014	P/V <i>Bahamas Celebration</i> (Bahamas), while departing Freeport Harbor, ran aground on the shoals just outside the left side of the channel, breaching the hull in compartments 6 and 7 resulting in a loss of propulsion. On-scene support.	0	04/29/2016
Castries, St. Lucia	12/11/2014	On P/V <i>Insignia</i> (Marshall Islands), a fire started in the vicinity of the fuel supply connection to Diesel Generator No.4. Witnesses in the engine room said that, within a few seconds, the compartment filled with smoke and the lights went out. Three of the six people in the engine room escaped. The remaining three, a crewman and two contractors, died in the fire.	3	04/19/2016
IVO Crooked Island, Bahamas	09/17/2015	P/V <i>Carnival Pride</i> (Panama), carrying 2,680 passengers and 920 crewmembers, suffered a catastrophic mechanical failure to one of its on-line main diesel-electric generators while underway off the coast of Crooked Island, Bahamas. On-scene support.	0	04/1/2016
Falmouth Harbor, Jamaica	07/22/2015	P/V <i>Freedom of the Seas</i> (Bahamas) experienced a fire in the port machinery exhaust casing while docking in Falmouth. On-scene support.	0	03/24/2016



Under the IMO Casualty Investigation Code, MS participated with the USCG as a substantially interested state in the following ongoing investigations of serious marine casualties involving foreign-flagged vessels in international waters:

Location	Date	Description*	Fatalities
Royal Navy Dockyard, Bermuda	07/20/2016	P/V <i>Norwegian Breakaway</i> (Bahamas), wire rope holding rescue boat parted, resulting in the boat falling into water.	1
80 nm off NC, Atlantic Ocean	02/07/2016	P/V <i>Anthem of the Seas</i> (Bahamas) encountered heavy weather, damage, and returned to its departure port of New York, New York.	0
Isla De Coiba, 14 nm off Panama	12/22/2015	P/V <i>Star Pride</i> (Panama) grounded off Panama coast.	0
Enroute Argostoli, Greece	10/22/2015	On P/V <i>Splendour of the Seas</i> (Bahamas), a diesel engine set fire.	0

## Ongoing Significant Marine Accident Investigations

Location	Date	Description*	Fatalities
Houston, TX	09/06/2016	M/V <i>Aframax River</i> , (tanker), allision and fire.	0
Off Southwest Harbor, ME	08/17/2016	CFV <i>Lydia &amp; Maya</i> , foundering.	0
Off San Juan harbor entrance, San Juan, Puerto Rico	08/17/2016	P/V <i>Caribbean Fantasy</i> , engine room fire.	0
Lake Tahoe, NV	08/16/2016	P/V <i>Tahoe Queen</i> , fire.	0
40 nm southeast of Sandy Hook, NJ	08/15/2016	CFV <i>Lady Gertrude</i> , foundering.	0
North of Memphis, TN	08/13/2016	T/V <i>Jaxon Aaron</i> , engine fire.	0
450 nm west of Dutch Harbor, AK	07/26/2016	CFV <i>Alaska Juris</i> , foundering.	0
8 nm east of St. Augustine, FL	07/24/2016	Tug <i>Thomas Dann</i> , fire.	0
Kailua-Kona, HI	07/24/2016	P/V <i>Spirit of Kona</i> , grounding.	0
King Cove, AK	07/24/2016	CFV <i>Ambition</i> , foundering.	0
Corpus Christi, TX	07/14/2016	Tug <i>The Admiral</i> , starboard engine fire and explosion.	1
Sabine Jetties, Sabine, TX	07/11/2016	CFV <i>Capt. Kevin</i> , foundering.	0
Ketchikan, AK	06/03/2016	P/V <i>Celebrity Infinity</i> , allision with berth.	0
Panama Canal, Panama City, Panama	06/02/2016	USCG cutter <i>Thetis</i> / Tug <i>Matachin</i> (Panama Flagged), collision in Panama Canal. (Public/Nonpublic).	0
Gros Cap Reef, Sault Ste. Marie, Ontario, Canada	05/27/2016	M/V <i>Roger Blough</i> (bulk carrier), grounding, Lake Superior.	0



Location	Date	Description*	Fatalities
Pacific Ocean, off Turtle Bay, Mexico	05/12/2016	P/V <i>Maximus</i> (US-flagged), flooding and sinking.	0
Baltimore, MD	05/08/2016	P/V <i>Carnival Pride</i> (Panama-flagged), allision with passenger terminal.	0
Houston Ship Channel, Houston, TX	04/19/2016	UTV <i>Rickey J. LeBoeuf</i> , capsized.	1
Thebes, IL	04/06/2016	UTV <i>Michael G Morris</i> , with 30 barges, allided with Thebes Railroad bridge on Mississippi River.	0
San Diego, CA	03/31/2016	P/V <i>Adventure Hornblower</i> , allision with pier.	0
New Orleans, LA	03/25/2016	M/V <i>Star of Abu Dhabi</i> (bulk carrier), allision with Imperial Sugar & Molasses Dock on Mississippi River.	0
Cathlamet, WA	03/21/2016	M/V <i>Sparna</i> (bulk carrier), allision with submerged object in Columbia River.	0
Port Orchard, WA	03/20/2016	Marina fire, recreational vessels.	0
Tarrytown, NY	03/12/2016	UTV <i>Specialist</i> , collision with construction at Tappan Zee bridge site, Hudson River.	3
Galveston, TX	03/07/2016	OSV <i>Hammerhead</i> , engine room flooding at pier.	0
Intracoastal Waterway, Chesapeake, VA	03/01/2016	UTV <i>Kodiak</i> , with tow, allision with bridge.	0
Houston, TX	02/26/2016	UTV <i>San Gabriel</i> , engine room lavatory fire.	0
32 nm northeast of Oregon Inlet, NC	02/15/2016	CFV <i>Capt David</i> , sinking after rescue of crew by US Navy small boat from the dock landing ship <i>USS Carter Hall</i> . (Public/Nonpublic)	0
800 nm south of HI	02/10/2016	CFV <i>American Eagle</i> (US-flagged), main engine room fire, 40 persons on board, abandoned vessel.	0
Lower Mississippi River, IVO mm 104	02/02/2016	M/V <i>Nordbay</i> (tanker), allision with two river water intakes on Lower Mississippi River, Louisiana.	0
Lower Mississippi River at Norco, LA	01/31/2016	M/V <i>Aris T.</i> (bulk carrier), allision with Shell Motiva docks.	0
Lower Mississippi River at Ama, LA	01/28/2016	UTV <i>Crimson Gem</i> , collision with moored M/V <i>Yangtze Ambition</i> (bulk carrier).	0
Lower Mississippi River at Natchez, MS	01/21/2016	UTV <i>Amy Frances</i> , allision with Hwy 84 bridge in view of Natchez.	0
Lower Mississippi River, mm 135, at Vacherie, LA	01/17/2016	M/V <i>Manizales</i> (cargo), allision with M/V <i>Zen-Noh Grain Pegasus</i> (bulk carrier).	0
Pago Pago Harbor, American Samoa	01/17/2016	CFV <i>Rafaello</i> , fire while moored at Pago Pago Harbor.	0
Ventura Beach, CA	01/10/2016	CFV <i>Day Island</i> , grounding on Ventura Beach.	0
Lake Union, Seattle, WA	12/29/2015	Marina fire damaging several recreational vessels.	0
100 nm north of Cartagena, Columbia	12/14/2015	UTV <i>Spence</i> (US-flagged), sinking.	0
Sturgeon Bay, WI	12/12/2015	M/V <i>Alpena</i> (bulk carrier), fire at repair facility.	0

Location	Date	Description*	Fatalities
Puget Sound, Seattle, WA	12/08/2015	M/V <i>Gunde Maersk</i> (containership), generator fire.	0
Cape Ann, MA	12/03/2015	CFV <i>Orin C</i> , flooding and loss of life during USCG rescue. (Public/Nonpublic)	1
South of Maui, HI	11/05/2015	CGC <i>Kiska</i> and S/V <i>Kolina</i> , towing with casualty. (Public/Nonpublic)	1
Corpus Christi, TX	10/29/2015	M/V <i>Ocean Freedom</i> (containership), collision with tank barge <i>Kirby 28044</i> and UTV <i>Nueces</i> .	0
36 nm northeast Crooked Island, Bahamas	10/01/2015	S/S <i>El Faro</i> (RO-RO), sinking, NTSB lead full team investigation.	33
St. Thomas, US Virgin Island	09/07/2015	P/V <i>Carnival Liberty</i> , engine room fire.	0
Paducah, KY	09/02/2015	UTV <i>PB Shah</i> collision with UTV <i>Dewey R</i> , Lower Mississippi River.	0
Bayonne, NJ	08/01/2015	UTV <i>Peter F Gellatly</i> , collision with International-Matex Tank Terminals Bayonne Pier A.	0
Ventura Harbor, CA	07/29/2015	F/V <i>Ferrigno Boy</i> , allision with pier.	0
Galveston, TX	07/08/2015	M/V <i>Asia Zircon II</i> (bulk carrier), cargo damage.	0
Gulf of Alaska, AK	06/10/2015	F/V <i>Kupreanof</i> , sinking in view of Cape Fairweather.	0
North Sea, 40 nm east of Harwich, UK	06/02/2015	M/V <i>Courage</i> (US-flagged vehicle carrier), vehicle deck fire, 40 nm east of Harwich, UK.	0

Note: Accidents noted are those where significant resources are being devoted to the investigation and where it is anticipated a product such as an accident report or brief will be adopted.

\*Vessel types:

- ATB – Articulated Tug Barges
- CFV – Commercial Fishing Vessel
- CGC – Coast Guard Cutter
- F/V – Fishing Vessel
- M/V – Motor Vessel
- OSV – Offshore Service/Supply Vessel
- P/V – Passenger Vessel
- RO-RO – Roll-On/Roll-Off Ship
- S/S – Steam Ship
- T/V – Towing Vessel
- UTV – Uninspected Towing Vessel

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## RAILROAD, PIPELINE AND HAZARDOUS MATERIALS

<b>Railroad, Pipeline and Hazardous Materials</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$9,154	38
FY 2018 Request	\$9,052	37
Increase/Decrease	(\$102)	(1)

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. A reduction in staff of 1 FTE is required to meet the FY 2018 request level. No other program changes are planned.

### Program Description

The Office of Railroad, Pipeline and Hazardous Materials Investigations (RPH) consists of four divisions: Railroad, Pipeline and Hazardous Materials, Human Performance and Survival Factors, and Report Development. RPH investigates accidents involving railroads, pipelines, and hazardous materials and evaluates the associated emergency response. Based on these investigations, the NTSB may issue safety recommendations to federal and state regulatory agencies, unions, industry and safety standards organizations, carriers and pipeline operators, equipment and container manufacturers, producers and shippers of hazardous materials, and emergency response organizations.

#### *Railroad Division*

Since 1967, Congress has assigned the primary responsibility for railroad accident investigations to the NTSB. As in the other surface modes, the NTSB investigates and analyzes select accidents, determines their probable causes, and issues recommendations to prevent similar accidents.

The Railroad Division investigates accidents and incidents involving passenger and freight railroads, as well as commuter rail transit systems and other fixed guideway systems. These accidents are typically collisions or derailments, some of which involve fatalities, severe injuries, release of hazardous materials, and evacuation of residences.

The railroad division staff do not investigate every railroad accident reported to the FRA or every rail transit accident reported to the FTA. To most efficiently use NTSB resources, criteria have been established to help highlight for investigation those accidents that pose significant safety issues. The division also assesses selected railroad safety issues, often based on a set of accident investigations specifically undertaken as the basis for such

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study. In other cases, the special studies may focus on analyses of regulations, railroad safety programs and procedures, and audit reviews of management and operations practices.

### ***Pipeline and Hazardous Materials Division***

The Pipeline and Hazardous Materials Division investigates accidents occurring during the transport of natural gas or other hazardous liquids, such as gasoline or propane, through underground pipeline systems, as well as accidents that threaten public safety by the release of hazardous substances. Pipeline investigations focus on accidents that involve fatalities or result in substantial property or environmental damage. This division may also investigate select hazardous materials accidents that highlight safety issues of national importance or involve a specific accident prevention issue.

The hazardous materials staff investigates accidents involving the release of hazardous materials in all modes of transportation, including aviation, highway, rail, and marine. An investigation may include analysis of the performance of hazardous materials containers, such as rail tank cars, highway cargo tanks, and smaller nonbulk packaging. The division also investigates environmental response issues in all modes, including pipeline.

### ***Human Performance and Survival Factors Division***

The Human Performance and Survival Factors Division investigates the human factors and survivability aspects of railroad, pipeline, and hazardous materials accidents. The human factors range from individual actions, training, and tools; through work crew resource management, oversight, and supervision; to organizational safety management and safety culture. The survivability issues range from occupational protection systems such as lighting, seat restraints, and crashworthiness of occupied spaces; through emergency response processes, training, and drills; to community-based programs for improved public awareness, evacuations, and 811- and 911-notifications.

The human factors and survivability investigations typically involve inquiries that extend well beyond the debris field of an accident site. Failures of operational systems rarely are isolated to the last component to break or malfunction. Rather, the reasons for system failures often are traceable to management decisions and corporate cultural influences. Once these systemic failures are identified and understood, the staff works to develop corresponding safety recommendations. Specific topics evaluated include drug and alcohol usage, work/rest cycles and human fatigue, individual and team training, organizational safety culture and safety management, and public awareness.

### ***Report Development Division***

The Report Development Division is responsible for drafting and editing railroad, pipeline, and hazardous materials reports and briefs. Staff reviews, writes, and edits work products to ensure the adequacy of logic, organization, and structure. In addition, the division's editors ensure the quality of NTSB reports, responses to notices of proposed

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rulemaking, papers, congressional testimony, and speeches (or portions thereof) on matters pertaining to railroad, pipeline, and hazardous materials safety. The division is also responsible for the effective development of NTSB transportation safety policy, guidance, protocols, applicable portions of NTSB orders, and replies to safety inquiries from Congress, other federal agencies, state and local agencies, industry, and the general public.

## Accomplishments and Workload - Railroad

This office's accomplishments include issuance of numerous products related to transportation safety arising from completed and ongoing investigations. Products completed October 1, 2015, through September 30, 2016, are highlighted below together with information on other efforts and focus areas important to both the current and future mission of the agency.

### *Railroad Accident Reports*

Accident reports are issued for major accidents and are adopted by the Board.

#### **Derailment of Amtrak Passenger Train 188 Philadelphia, Pennsylvania May 12, 2015**

On May 12, 2015, eastbound Amtrak passenger train 188 derailed in Philadelphia, Pennsylvania, with 245 passengers and 8 Amtrak employees on board. The train had just entered the Frankford Junction curve—where the speed is restricted to 50 mph—at 106 mph. As the train entered the curve, the locomotive engineer applied the emergency brakes. Seconds later, the train derailed. Eight passengers died, and 185 others were transported to area hospitals.

The NTSB determined that the probable cause of the accident was the engineer's acceleration to 106 mph as he entered a curve with a 50 mph speed restriction, due to his loss of situational awareness likely because his attention was diverted to an emergency situation with another train. Contributing to the accident was the lack of a PTC system. Contributing to the severity of the injuries were the inadequate requirements for occupant protection in the event of a train overturning.

This report addresses the following safety issues: crewmember situational awareness and management of multiple tasks; PTC; passenger railcar window systems and occupant protection; and transportation of the injured after mass casualty incidents.

As a result of the investigation of this accident, the NTSB issued safety recommendations to Amtrak, the FRA, the American Public Transportation Association, the Association of American Railroads, the Philadelphia Police Department, the Philadelphia Fire Department, the Philadelphia Office of Emergency Management, the mayor of the city of Philadelphia, the National Association of State Emergency Medical Services (EMS) Officials, the National Volunteer Fire Council, the National Emergency

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Management Association, the National Association of EMS Physicians, the International Association of Chiefs of Police, and the International Association of Fire Chiefs.

Recommendations: 11 new  
Report Adopted: May 17, 2016

During the investigation, but before the Board meeting, the NTSB issued recommendations to the FRA and Amtrak to require the installation, in all controlling locomotive cabs and cab car operating compartments, of crash- and fire-protected inward- and outward-facing audio and image recorders capable of providing recordings to verify train crew actions. The NTSB also reiterated safety recommendations to the FRA to develop a performance standard to ensure that windows (that is, glazing, gaskets, and any retention hardware) are retained in the window opening structure during an accident.

Recommendations: 3 new, 3 reiterated  
Recommendations Adopted: July 8, 2015

**WMATA L’Enfant Plaza Station Electrical Arcing and Smoke Accident  
Washington, DC  
January 12, 2015**

On January 12, 2015, WMATA southbound Yellow Line train 302, with about 380 passengers on board, stopped after encountering heavy smoke in the tunnel between the L’Enfant Plaza station and the Potomac River Bridge in Washington, DC. The operator of train 302 told the Rail Operations Control Center (ROCC) that the train was filling with smoke and he needed to return to the station. The ROCC allowed train 510, following train 302, to enter the L’Enfant Plaza station, which also was filling with smoke. Train 302 was unable to return to the station before power to the electrified third rail, which supplied the train’s propulsion power, was lost. Some passengers on train 302 evacuated the train on their own, and others were assisted in evacuating by first responders from the District of Columbia Fire and Emergency Medical Services Department. As a result of the accident, 91 people were injured, including passengers, emergency responders, and WMATA employees, and one passenger died.

The NTSB determined that the probable cause of the WMATA L’Enfant Plaza station electrical arcing and smoke accident was a prolonged short circuit that consumed power system components resulting from the WMATA’s ineffective inspection and maintenance practices. The ineffective practices persisted as the result of (1) the failure of WMATA senior management to proactively assess and mitigate foreseeable safety risks, and (2) the inadequate safety oversight by the Tri-State Oversight Committee and the FTA. Contributing to the accident were WMATA’s failure to follow established procedures and the District of Columbia Fire and Emergency Medical Services Department’s being unprepared to respond to a mass casualty event on the WMATA underground system.

The safety issues and conditions identified in this accident, which illustrate WMATA’s lack of a safety culture, were the WMATA response to smoke reports, tunnel

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ventilation, railcar ventilation, emergency response, and oversight and management of WMATA.

As a result of the investigation of this accident, the NTSB issued safety recommendations to the FTA, the mayor of the District of Columbia, the District of Columbia Office of Unified Communications, the District of Columbia Fire and Emergency Medical Services Department, and WMATA.

Recommendations: 31 new, 9 reiterated  
 Report Adopted: May 3, 2016

During the investigation, but before the Board meeting, the NTSB issued safety recommendations to the US DOT, the FTA, WMATA, and the American Public Transportation Association.

Recommendations: 9 new  
 Recommendations Adopted: February 10, June 4, and September 15, 2015

### ***Railroad Accident Briefs***

Accident briefs are more limited with the primary purpose of determining probable cause. They may be adopted by the Office Director under delegated authority or may be adopted by the Board. There were six briefs completed in FY 2016.

#### **Denver Airport Undesired Train Acceleration and Deceleration Railroad Accident Brief**

**Denver, Colorado**  
**March 19, 2016**

On March 19, 2016, train 425 of the Denver, Colorado, International Airport's Automated Guided Transport System was routed from East Concourse C to the West Main Terminal through a turnout when it accelerated and then decelerated. No operator was on board the automated train. Four passengers were injured.

The NTSB determined that the probable cause of the accident was a coding error in the software that allowed an incorrect speed code to be sent to the train while it traversed the crossover, resulting in rapid acceleration.

Recommendations: None  
 Brief Adopted: September 30, 2016



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**Norfolk Southern Railway Company Employee Fatality During Switching Operations**  
**Petal, Mississippi**  
**August 12, 2015**

On August 12, 2015, a Norfolk Southern conductor trainee working at the Lone Star Gas facility (H 82) on the NS Alabama Division in Petal, Mississippi, was killed when he was pinned between two tank cars that were being coupled on the industry track.

The accident occurred inside the Lone Star liquefied petroleum gas transloading facility in Petal, Mississippi, about 5 miles east of Hattiesburg. H 82 was east of the Norfolk Southern main track, a siding track, and a back track. Train movements on the main track were authorized by track warrants and governed by operating rules, general orders, timetable instructions, and the signal indications of an absolute block system.

The NTSB determined that the probable cause of the accident was the conductor trainee stepping in between two tank cars without protection for an unknown reason during the shove movement.

Recommendations: None  
Brief Adopted: September 28, 2016

**CSX Transportation (CSXT) Petroleum Crude Oil Train Derailment and Hazardous Materials Release**  
**Lynchburg, Virginia**  
**April 30, 2014**

On April 30, 2014, at 1:54 p.m. eastern daylight time, 17 CSXT tank cars on petroleum crude oil unit train K08227 derailed in Lynchburg, Virginia. Three of the derailed cars were partially submerged in the James River. One was breached and released 29,868 gallons of crude oil into the river, some of which caught fire. No injuries to the public or crew were reported. The CSXT estimated the damages at \$1.2 million, not including environmental remediation.

The NTSB determined that the probable cause of this accident was a broken rail caused by a reverse detail fracture with evidence of rolling contact fatigue.

In this brief, the NTSB reclassified three safety recommendations.

Recommendations: 3 reclassified  
Brief Adopted: March 2, 2016



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**Collision of Two UP Freight Trains  
Galva, Kansas  
September 25, 2014**

On September 25, 2014, eastbound UP train ILXG4X-22 collided with the side of westbound UP train KG4GSX-23 near Galva, Kansas. The westbound train was entering a siding but had not cleared the main track when it was struck by the eastbound train. Five multiplatform intermodal cars derailed from the westbound train. Two locomotive units and four multiplatform intermodal cars derailed from the eastbound train. The UP estimated about 200 gallons of diesel fuel leaked from the fuel tank of one of the derailed locomotives. No crewmembers on either train were seriously injured. No fire resulted from the collision.

The NTSB determined that the probable cause of this accident was the green light-emitting diode signal at control point (CP) 207 masked the red signal aspect at the east end of the Galva siding at CP 208, resulting in the crew of eastbound train ILXG4X passing the red stop signal and colliding with westbound train KG4GSX. Contributing to the accident was the UP's failure to conduct a risk assessment of the new CP installation at CP 207.

Recommendations: None  
Brief Adopted: December 9, 2015

**Locomotive Engineer Has Seizure While Operating Train  
Arden, Nevada  
August 7, 2014**

On August 7, 2014, UP local train LUM41-06 traveled into a Ken's Foods, Inc., warehouse, ran through the end-of-track bumping post, and then collided with the inside wall while switching cars. The train consisted of 3 locomotives and 14 loaded tank cars. Three Ken's Foods employees were in the warehouse at the time. There were no injuries, and estimated damages were \$188,000.

The NTSB determined that the probable cause of the accident was the engineer's failure to stop train LUM41-06 before it collided with the bumping post and the inside wall of the building because he was incapacitated by a seizure. Contributing to the accident was the FRA's failure to establish medical certification standards, other than hearing and vision criteria, for railroad employees in safety-sensitive positions.

The NTSB issued safety recommendations to the UP and the FRA and reiterated one safety recommendation to the FRA regarding medical standards for railroad employees.

Recommendations: 5 new, 1 reiterated  
Brief Adopted: October 28, 2015

## Ongoing Significant Railroad Accident Investigations

Location	Date	Description	Fatalities
Hoboken, NJ	09/29/2016	NJ Transit train crashed into station (100 injured).	1
Chester, PA	04/03/2016	Amtrak struck backhoe and derailed.	2
Cimarron, KS	03/14/2016	Amtrak train derailed (emergency braking).	0
Northfield, VT	10/05/2015	Amtrak locomotive and 2 cars derailed at a rockslide.	0
Homewood, IL	07/25/2015	Conductor fell from moving locomotive.	1
Minneapolis, MN	05/25/2015	Train struck panel that killed maintenance of way employee.	1
Heimdal, ND	05/06/2015	Burlington Northern Santa Fe Railway (BNSF) crude oil train derailed; fire; evacuation.	0
Valhalla, NY	02/03/2015	Metro-North Train struck SUV; subsequent explosion and fire.	6
Hoxie, AR	08/17/2014	2 UP trains collided; town evacuation.	2
Casselton, ND	12/30/2013	BNSF oil train struck derailed grain train; subsequent fire & evacuation.	0

Note: Accidents noted are those where significant resources are being devoted to the investigation and where it is anticipated a product such as an accident report or brief will be adopted.

## Accomplishments and Workload - Pipeline

This division's accomplishments include issuance of many products related to transportation safety arising from completed and ongoing investigations. Products completed October 1, 2015 through September 30, 2016 are highlighted below, together with information on other efforts and focus areas important to both the current and future mission of the agency.

### *Pipeline Accident Briefs*

Accident briefs are more limited than accident reports with the primary purpose of determining probable cause. They may be adopted by the Office Director under delegated authority or may be adopted by the Board.

#### **Birmingham Public Housing Gas Explosion Birmingham, Alabama December 17, 2013**

On December 17, 2013, one side of a two-story duplex at a public housing project in Birmingham, Alabama, exploded when natural gas in the apartment ignited. The explosion and fire destroyed one unit and heavily damaged the adjoining unit. The explosion also damaged several adjacent homes at the Charles P. Marks Village, operated by the Housing Authority of the Birmingham District. A Birmingham Fire and Rescue

Service official said six residents were blown out of the apartment; two received nonlife-threatening injuries. Two adults sleeping in a downstairs bedroom were crushed when the second floor collapsed. One died at the scene, and the other was critically injured.

The NTSB determined that the probable cause of the accident was the release of natural gas through a large crack in the 62-year-old, cast iron gas main that resulted when tree growth cracked the corroded pipe. Once the accumulating gas reached the explosive limit inside the apartment, an active pilot light on an appliance ignited the gas. Contributing to the accident was the absence of the odorant, which was absorbed by the soil and prevented residents from smelling the gas.

Recommendations: None  
 Brief Adopted: March 30, 2016

## Ongoing Significant Pipeline Accident Investigations

Location	Date	Description	Fatalities
Silver Spring, MD	8/10/2016	Apartment explosion (40 injured).	7
Centreville, VA	9/21/2015	4,000 gallons of gasoline from a Colonial Pipeline filled a storm-water retention pond.	0

Note: Accidents noted are those where significant resources are being devoted to the investigation and where it is anticipated a product such as an accident report or brief will be adopted.

## Accomplishments and Workload - Hazardous Materials

This division’s accomplishments include issuance of products related to transportation safety arising from completed and ongoing investigations. Products completed October 1, 2015 through September 30, 2016 are highlighted below, together with information on other efforts and focus areas important to both the current and future mission of the agency.

### Roundtable Discussion: A Dialogue on What’s Next in Rail Tank Car Safety July 13, 2016

Among the provisions of the 2015 Fixing America’s Surface Transportation Act are new requirements for improved railroad operating practices, more effective emergency responses, and safer and stronger tank cars. While tank car fleet owners must decide whether to replace or retrofit legacy DOT-111 and CPC-1232 tank cars over the next 13 years, the NTSB continues to investigate serious accidents with flammable liquids releases and fires.

Rail tank car safety is of vital interest to the NTSB and was on the agency’s 2016 MWL. Because of the concern over tank car safety, a roundtable was hosted to better understand issues facing implementation of the Fixing America’s Surface Transportation Act requirements. The NTSB gained a deeper understanding of the logistics of replacing

the existing tank car fleet to transport flammable materials, as well as how government and industry can overcome factors that could impede timely implementation of the new tank car rules.

### *Stand-Alone Safety Recommendation Letters*

Stand-alone safety recommendation letters may be issued at any time during an accident investigation. If the Board determines that the course of action recommended requires immediate attention to avoid imminent loss due to a similar accident, the safety recommendation is designated as “urgent.” Noted in this section is a stand-alone/urgent safety recommendation letter related to specific accident investigations but issued apart from the report or brief.

- On February 9, 2016, the NTSB issued a safety recommendation letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA) with two safety recommendations addressing cargo controls by limiting the density of lithium batteries loaded in one place on an aircraft and segregating them from flammable liquids to reduce the severity of potential cargo fires and to provide additional time to safely land an airplane in the event a cargo fire is detected. These recommendations were derived from the NTSB’s participation in the Aviation and Railway Accident Investigation Board, Republic of Korea, investigation of the July 28, 2011, in-flight fire and crash of Asiana Airlines Flight 991 in international waters about 130 kilometers west of Jeju International Airport.

### Ongoing Significant Hazardous Materials Accident Investigations

Location	Date	Description	Fatalities
New Martinsville, WV	08/27/2016	Tank car chlorine leak; evacuations and injuries.	0
Brampton, Ontario, Canada	06/03/2016	Battery fire on delivery truck.	0

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## RESEARCH AND ENGINEERING

<b>Research and Engineering</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$11,483	44
FY 2018 Request	\$11,626	44
Increase/Decrease	\$143	0

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. No program changes are planned.

### Program Description

The Office of Research and Engineering (RE) provides technical expertise to NTSB accident investigations in all modes of transportation. The office, which includes five divisions and one program area, also conducts safety studies, generates periodic statistical reviews of aviation accidents, and provides medical and toxicology expertise for investigations in all modes.

#### *Safety Research Division*

The Safety Research Division examines accidents, accident trends, and technological changes to identify problems and associated remedial actions that will reduce transportation risk and improve the safety of the transportation system. Division staff includes transportation research and data analysts, who provide statistical support to other NTSB offices and develop safety studies and other safety research products. The division also responds to requests for data analysis and statistical information from Board Members, Congress, and the public. Some of these requests require a rapid response to support Board Members and investigators during the initial phase of an accident investigation.

#### *Materials Laboratory Division*

The Materials Laboratory Division performs expert multidisciplinary engineering and scientific analyses to determine whether the performance of materials and structures is related to the cause or severity of an accident. Engineers also analyze wreckage to determine the causes of fires and explosions. The division provides chemical and forensic science support, as well as technical advice and support for experimental testing and research in the physical sciences.

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## ***Vehicle Recorder Division***

The Vehicle Recorder Division extracts, formats, and analyzes data from aircraft FDRs and CVRs, as well as from recorders installed in locomotives, large ships, and some highway vehicles. Staff also examines recorded electronic audio and video information captured by aircraft, ship, train, and support communication systems; provides time synchronization to correlate voice, data, and video recorder outputs; and uses advanced digital and analog filtering and signal representation techniques to extract critical recorder information.

## ***Electronics Division***

The Electronics Division was formed in 2015 to develop and maintain a state-of-the-art electronic memory recovery laboratory with a specific focus on recovering data from damaged electronic devices including advanced avionics systems, portable electronic devices (PEDs), and communications systems. Additionally, the division specializes in the recovery and analysis of digital images and video. Division staff also serve as an agency-wide resource of electrical engineering and electronics expertise to support accident investigations in all modes.

## ***Vehicle Performance Division***

The Vehicle Performance Division provides specialized aeronautical, mechanical, structural, and biomechanical engineering support; three-dimensional laser scanning and accident reconstruction; photogrammetry and video analysis; and animation and graphics support for all modes. Staff uses computational and visualization technology to provide accurate time-motion histories of the sequence of events and evaluates data from multiple sources to determine vehicle and occupant motion and the underlying causes of that motion. The division also develops video animations of accident scenarios, evaluates occupant injury mechanisms, and participates in and directs research into other special projects as required.

## ***Medical Investigative Consultation***

RE medical staff evaluates the medical aspects of investigations, including pathology, toxicology, injury causation, and biomechanics. Examples of medical issues addressed include operator incapacitation, night vision, hypoxia, substance impairment, obstructive sleep apnea, and use of prescription and over-the-counter medications.

## **Accomplishments and Workload**

### ***Safety Research Division***

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Between October 1, 2015 and September 30, 2016, Safety Research Division staff responded to 425 requests for data analysis and statistical information from other NTSB offices, Board Members, Congress, and the public. In addition to responding to analysis requests, Safety Research Division staff support accident investigations.

**Derailment of Amtrak Passenger Train 188  
Philadelphia, Pennsylvania  
May 12, 2015**

Amtrak passenger train 188 derailed traveling 106 mph on a high-degree curve with a permanent speed restriction of 50 mph near Frankford Junction in Philadelphia. A staff member was launched to support on-scene activities and conduct three-dimensional laser scanning of the locomotive and accident scene.

Report Adopted: May 17, 2016

**WMATA L’Enfant Plaza Station Electrical Arcing and Smoke Accident  
Washington, DC  
January 12, 2015**

A WMATA train with about 380 passengers on board encountered heavy smoke and stopped while traveling in a tunnel near L’Enfant Plaza station. Staff participated in the investigation of organizational and oversight factors that contributed to the circumstances of the accident.

Report Adopted: May 3, 2016

**Commercial Truck Collision with Stopped Vehicles on Interstate 88  
Naperville, Illinois  
January 27, 2014**

A combination vehicle collided with vehicles stopped in a traffic lane attempting to assist a disabled truck-tractor semitrailer. Staff provided geographic information and mapping support to the investigation.

Report Adopted: February 9, 2016

**Truck-Tractor Semitrailer Median Crossover Collision With Medium-Size Bus on  
Interstate 35  
Davis, Oklahoma  
September 26, 2014**

A truck-tractor crossed the center median and collided with a medium-size bus. Staff provided data analyses of median crossover accidents and geographic analysis support.

Report Adopted: November 17, 2015



**School Bus Roadway Departure  
Anaheim, California  
April 24, 2014**

A 2012 Blue Bird 78-passenger All American school bus equipped with lap/shoulder belts at all seats departed the roadway and impacted a light pole and trees. Staff provided geographic information and mapping support to the investigation.

**Multivehicle Work Zone Crash on Interstate 75  
Chattanooga, Tennessee  
June 25, 2015**

A combination truck-tractor and semitrailer struck a line of slowed traffic while approaching a highway work zone. Staff provided geographic information and mapping support to the investigation.

**Rail Employee Fatality  
Petal, Mississippi  
August 12, 2015**

A Norfolk Southern Railway Company conductor trainee died during switching operations. Staff provided geographic information and mapping support to the investigation.

**Amphibious Passenger Vehicle DUCK 6 Lane Crossover Collision With Motorcoach  
on State Route 99, Aurora Bridge  
Seattle, Washington  
September 24, 2015**

A motorcoach was struck by a 1945 DUCK amphibious military vehicle modified for tour operations. Staff provided geographic information and mapping support.

**Sinking of Cargo Ship *El Faro*  
36 nm northeast of Acklins and Crooked Islands, Bahamas  
October 1, 2015**

The US-flagged cargo ship *El Faro* sank during Hurricane Joaquin. Staff assisted in the documentation and analysis of geographic data during the search for the wreckage and voyage data recorder. Staff is also assisting in the analysis of communications with the crew of *El Faro*.

**Motorcoach Impact With a Concrete Barrier**  
**San Jose, California**  
**January 19, 2016**

A Greyhound motorcoach struck a barrier in a gore area of US Highway 101 and overturned. Staff is providing data analysis, geographic analysis, and satellite imagery support to the investigation.

**Collision Between a Passenger Car and Combination Vehicle**  
**Robstown, Texas**  
**March 20, 2016**

A passenger car crossed the center median and collided with a combination vehicle. Staff is providing geographic information and mapping support to the investigation.

**Tesla Model S Collision with Truck-Tractor Semitrailer Combination Vehicle**  
**Williston, Florida**  
**May 7, 2016**

A 2015 Tesla Model S, traveling eastbound on US Highway 27A, struck and passed beneath a 2014 Freightliner Cascadia truck-tractor in combination with a 53-foot semitrailer. Staff is providing geographic information and mapping support to the investigation.

**Motorcoach Rollover**  
**Laredo, Texas**  
**May 14, 2016**

A motorcoach, traveling through a curve in wet weather, yawed and rolled over. Staff is providing geographic information and mapping support to the investigation.

**Transport Bus Collision With Combination Vehicle**  
**St. Marks, Florida**  
**July 2, 2016**

A transport bus entered an intersection and was struck by a combination vehicle. A postcrash fire ensued, consuming both vehicles. As a result of the crash, three passengers on the bus and the driver of the combination vehicle died. Staff is providing a data analysis report, geographic information, and mapping support to the investigation.

**An Assessment of the Effectiveness of the USCG Vessel Traffic Service System Safety Study**

The USCG vessel traffic service (VTS) is a shore-based surveillance and communications system with the authority to ensure the safe and efficient movement of vessel traffic in particularly hazardous or congested waterways in the United States. The system's primary mission is to reduce the risk of collisions, allisions, and groundings.

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There are 12 USCG VTS centers that make up the VTS system, and each center is responsible for managing the traffic that operates inside its designated VTS area. This study assessed the USCG VTS system's ability to effectively control vessel traffic movements, recognize unsafe situations, and provide timely warning of such dangers.

Report Adopted: September 13, 2016

### **Reducing Speeding-Related Crashes: An Evaluation of Current and Emerging Countermeasures**

#### **Safety Study**

**Initiated October 2015, expected completion Spring 2017**

According to NHTSA, speeding-related fatalities comprised 29 percent (or 9,613) of the 32,719 fatalities on public roads during 2013. Speeding causes hundreds of thousands of injuries and billions of dollars in medical costs each year. This study is evaluating the effectiveness of current and emerging countermeasures designed to reduce speeding associated risks. The evaluation includes intervention programs at the national, state, and local levels. The study focuses on passenger vehicles, which are involved in the majority of speeding-related deaths and injuries.

#### **International Advocacy**

Safety Research Division staff participated in several international advocacy efforts in FY 2016. Staff participated in the ICAO group of experts selected to propose updates to international standards and recommended practices on safety information protection and develop an ICAO manual on the protection of accident and incident investigation records, which was published in June 2016.

#### ***Materials Laboratory Division***

Materials Laboratory engineers examine parts and wreckage from more than 150 accidents in a typical year from all transportation modes and document findings through formal factual reports, study reports, analytical reports, and safety recommendations.

#### **WMATA L'Enfant Plaza Station Electrical Arcing and Smoke Accident**

**Washington, DC**

**January 12, 2015**

A WMATA train with about 380 passengers on board encountered heavy smoke and stopped while traveling in a tunnel near L'Enfant Plaza station. Staff conducted an analysis of power cables, connector covers, and other components involved in the arcing event.

Report Adopted: May 3, 2016

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**Birmingham Public Housing Gas Explosion**  
**Birmingham, Alabama**  
**December 17, 2013**

One side of a two-story duplex at a public housing project in Birmingham, Alabama, exploded when natural gas in the apartment ignited. The explosion and fire destroyed one unit and heavily damaged the adjoining apartment. The duplex was operated by the Housing Authority of the Birmingham District. Staff conducted a fire and explosion investigation and a metallurgical failure analysis of a gas line.

Report Adopted: March 30, 2016

**CSXT Petroleum Crude Oil Train Derailment and Hazardous Materials Release**  
**Lynchburg, Virginia**  
**April 30, 2013**

CSXT tank cars on a petroleum crude oil unit train derailed in Lynchburg, Virginia. Three of the derailed cars were partially submerged in the James River. One was breached and released about 29,868 gallons of crude oil into the river, some of which caught fire. Staff conducted metallurgical evaluations of the track and breached tank car.

Report Adopted: March 2, 2016

**Selected Issues in Passenger Vehicle Tire Safety**  
**Special Investigation Report, HS**  
**October 27, 2015**

The NTSB investigated four tire-related vehicle crashes that resulted in 12 fatalities and 42 injuries. The NTSB also held a Passenger Vehicle Tire Safety Symposium on December 9-10, 2014, to learn more about tire-related accidents. Staff conducted failure analyses of tires involved in two of the accidents considered in the special investigation report.

Report Adopted: October 27, 2015

**Crude Oil Freight Train Derailment**  
**Heimdal, North Dakota**  
**May 6, 2015**

A BNSF crude oil unit train derailed, resulting in a fire with heavy smoke and evacuation of local residents. Staff conducted a metallurgical failure analysis of a fractured train wheel using techniques such as fractography and x-ray residual stress analysis.

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**In-flight Breakup of a Giles 202  
Newburgh, New York  
August 28, 2015**

A Giles 202 was destroyed when it collided with terrain after experiencing an in-flight separation of the tail section while practicing for an air show. Staff conducted an analysis of the composite-material fuselage.

**British Airways Boeing 777 Engine Fire  
Las Vegas, Nevada  
September 8, 2015**

An engine fire occurred during takeoff of British Airways flight 2276, a Boeing 777, at McCarran International Airport. Staff conducted a metallurgical failure analysis of the failed engine components.

**Gasoline Pipeline Accident  
Centreville, Virginia  
September 21, 2015**

A pipeline released about 2,000 gallons of gasoline. Staff conducted an on-scene evaluation of the failed section of pipeline and a metallurgical failure analysis of the pipe rupture.

**Amphibious Passenger Vehicle DUCK 6 Lane Crossover Collision With Motorcoach  
on State Route 99, Aurora Bridge  
Seattle, Washington  
September 24, 2015**

A motorcoach was struck by a 1945 DUCK amphibious military vehicle modified for tour operations. Staff conducted a metallurgical failure analysis of the DUCK axle and associated components.

**In-flight Rapid Depressurization and Emergency Landing of a Lockheed 382G  
Airplane  
Iliamna, Alaska  
February 12, 2016**

A Lockheed 382G domestic cargo airplane had a rapid depressurization during cruise flight. The flight crew declared an emergency and diverted to Iliamna Airport. Examination of the airplane revealed a large hole in the forward pressure bulkhead. Staff conducted laboratory metallurgical analysis of the failed forward bulkhead.

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**Liquefied Petroleum Gas Cargo Tank Truck Accident and Release**  
**Stroud, Alabama**  
**March 11, 2016**

A truck tractor in combination with a cargo tank semitrailer loaded with liquid propane gas was traveling northbound on US Highway 431 near Stroud, Alabama, when the vehicle experienced a tire failure, resulting in the driver's loss of control. The cargo tank was breached and exploded. Staff conducted metallurgical evaluations of the cargo tank and portions of the tractor.

**Uncontained Failure of a Turbine Engine on a Boeing 777**  
**Tokyo, Japan**  
**May 27, 2016**

Korean Air flight 2708 rejected takeoff from Tokyo Haneda International Airport after the left engine lost power and caught fire. The NTSB Materials Laboratory assisted the Japan Transport Safety Board on a metallurgical examination of a failed first-stage turbine disk from a Pratt & Whitney PW 4090 engine.

**Natural Gas Explosion of an Apartment Complex**  
**Silver Spring, Maryland**  
**August 10, 2016**

A natural gas explosion and subsequent fire at the Flower Branch Apartments in Silver Spring, Maryland, resulted in seven fatalities and injured dozens. Staff conducted metallurgical evaluations of the natural gas piping.

**Fracture of Railroad Tank Car and Release of Liquid Ammonia**  
**New Martinsville, West Virginia**  
**August 27, 2016**

A full liquid chlorine rail car ruptured, resulting in two injuries. Staff conducted metallurgical evaluations of the tank car material.

**Uncontained Failure of a Turbine Engine on a Boeing 737**  
**Pensacola, Florida**  
**August 27, 2016**

A Southwest Boeing 737 flying from New Orleans International Airport to Orlando International Airport experienced uncontained engine failure during flight and diverted to Pensacola International Airport. Staff conducted metallurgical evaluations of failed turbine engine fan blades.

**Technological Upgrades**

The Materials Laboratory technological capability has grown steadily over the past several years. The laboratory installed a three-dimensional metrology system for measuring

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critical dimensions on accident components. To support fire and explosion investigations, the laboratory installed a fire modeling computing system running PyroSim and Fire Dynamics Simulator modeling software. The system has capabilities for scenario modeling for tenability and evacuation time, the effect of fire on structures, and the effect of materials selection on tenability and evacuation. Additionally, the laboratory acquired a new baking soda blasting system for removing paint and corrosion product from accident components without damaging the underlying materials.

### ***Vehicle Recorder and Electronics Divisions***

In a typical year, the Vehicle Recorder and Electronics laboratories receive about 600 recording devices and complete more than 500 readouts, transcripts, and studies in support of aviation, rail, marine, and highway investigations.

#### **Runway Excursion During Landing, Delta Air Lines Flight 1086, Boeing MD-88 New York, New York March 5, 2015**

Delta Air Lines flight 1086, a Boeing MD-88 flying from Atlanta, Georgia, to New York, New York, exited the left side of runway 13, struck a perimeter fence with its left wing, and came to rest with its nose on an embankment. Engineers downloaded the CVR and FDR, completed an audio transcription group, and documented the findings from both recorders.

Report Adopted: September 13, 2016

#### **Collision between Bulk Carrier *Conti Peridot* and Tanker *Carla Maersk* Houston Ship Channel near Morgan's Point, Texas March 9, 2015**

The inbound Liberian-registered freighter motor vessel *Conti Peridot* collided with the outbound Danish-registered tanker *Carla Maersk* in the Houston Ship Channel. An engineer launched to the scene, downloaded each ship's voyage data recorder, and served as group chairman for the transcription of both audio recordings.

Report Adopted: June 20, 2016

#### **Aerodynamic Stall and Loss of Control During Approach, Embraer EMB-500 Gaithersburg, Maryland December 8, 2014**

An EMB-500 impacted terrain and three houses about 0.75 miles short of runway 14 while on approach to Montgomery County Airpark. An engineer downloaded the airplane's CVR and investigated other electronic devices for this event.

Report Adopted: June 7, 2016



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**Derailment of Amtrak Passenger Train 188  
Philadelphia, Pennsylvania  
May 12, 2015**

Amtrak passenger train 188 derailed traveling 106 mph on a high-degree curve with a permanent speed restriction of 50 mph near Frankford Junction in Philadelphia. A staff member was launched to support on-scene activities and download locomotive event recorders. Engineers also processed forward-facing video, recovered surveillance video, PEDs, and cell phone records from this event.

Report Adopted: May 17, 2016

**WMATA L’Enfant Plaza Station Electrical Arcing and Smoke Accident  
Washington, DC  
January 12, 2015**

A WMATA train with about 380 passengers on board encountered heavy smoke and stopped while traveling in a tunnel near L’Enfant Plaza station. Staff documented extensive sets of event recorder data for the accident and subsequent testing. Staff also analyzed and documented station surveillance videos to develop a timeline of the accident. In addition, staff supported an analysis of the communications systems being used at the time of the accident.

Report Adopted: May 3, 2016

**Commercial Truck Collision with Stopped Vehicles on Interstate 88  
Naperville, Illinois  
January 27, 2014**

A combination vehicle collided with vehicles stopped in a traffic lane attempting to assist a disabled truck-tractor semitrailer. An engineer downloaded and analyzed the engine control modules from a Freightliner tractor and a Volvo tractor. The recorded data from the Freightliner engine control module indicated the time of the last hard braking event.

Report Adopted: February 9, 2016

**Truck-Tractor Semitrailer Median Crossover Collision With Medium-Size Bus on  
Interstate 35  
Davis, Oklahoma  
September 26, 2014**

A truck-tractor crossed the center median and collided with a medium-size bus. An engineer was launched to the accident and recovered several recording devices. However, due to a power loss during the collision sequence, the recorded data was of limited value to the investigation. As a result, the NTSB reiterated recommendations to NHTSA

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regarding recording standards and requirements for onboard recording systems for large commercial vehicles.

Report Adopted: November 17, 2015

**Transit Train Impact with Platform  
Hoboken, New Jersey  
September 30, 2016**

New Jersey Transit train 1614 failed to stop, overrode a bumping post at the end of track 5, and struck a wall of the New Jersey Transit Hoboken Terminal. A staff member launched to the scene, and engineers are working on locomotive event recorder data, forward-facing video recordings, and security video.

**Tesla Model S Collision with Truck-Tractor Semitrailer Combination Vehicle  
Williston, Florida  
May 7, 2016**

A 2015 Tesla Model S, traveling eastbound on US Highway 27A, struck and passed beneath a 2014 Freightliner Cascadia truck-tractor in combination with a 53-foot semitrailer. An engineer launched to the scene and recovered recorded Tesla system performance data, which is being analyzed.

**Collision of an Amtrak Passenger Train With Rail Maintenance Backhoe  
Chester, Pennsylvania  
April 3, 2016**

An Amtrak passenger train traveling 106 mph in a 110 mph zone struck a backhoe operated by roadway workers on the adjacent track. Engineers are working on locomotive event recorder data, forward-facing video recordings, and PEDs.

**Amtrak Train Derailment  
Cimarron, Kansas  
March 14, 2016**

An eastbound Amtrak passenger train derailed, resulting in 28 injured passengers and approximate damages of more than \$1.4 million. An engineer was launched to the scene and downloaded event recorders and forward-facing video recorders from three locomotives, including the last locomotive to travel on the track.

**Motorcoach Impact With a Concrete Barrier  
San Jose, California  
January 19, 2016**

A Greyhound motorcoach struck a barrier in a gore area of US Highway 101 and overturned. An engineer was launched to the scene, downloaded the engine control module, and worked with onboard video from the accident motorcoach and a trailing motorcoach.

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**Crash During Nonprecision Instrument Approach to Landing, Execuflight Flight 1526, British Aerospace HS 125-700A, N237WR  
Akron, Ohio  
November 10, 2015**

A British Aerospace Hawker 125 departed controlled flight while on approach to landing at Akron Fulton International Airport and impacted an apartment building. Staff downloaded the airplane's CVR and worked to factually document the contents of the recording as well as conduct a sound spectrum study.

**Sinking of Cargo Ship *El Faro*  
36 nm northeast of Acklins and Crooked Islands, Bahamas  
October 1, 2015**

The US-flagged cargo ship *El Faro* sank during Hurricane Joaquin. Engineers conducted extensive analysis of the limited data available and participated in the successful search in April 2016 for the ship's voyage data recorder. Engineers participated in the voyage data recorder recovery effort and then successfully downloaded and analyzed the recorded information.

**Technological Upgrades**

In FY 2016, the NTSB invested in further enhancements to the Vehicle Recorder and Electronic Divisions' core set of investigative tools. For example, the NTSB is currently upgrading its primary tool for data review and analysis including the migration of the legacy plotting function to a current open-source plotting library. Further, the NTSB began the process of integrating the transcription and audio sound spectrum analysis tools into one application to provide the capability of reviewing transcripts as well as time and frequency content of audio information, permit the measurement and documentation of key parameters, and support the construction of algorithms for advanced processing of audio data. Updates to these software programs will further improve the Vehicle Recorder and Electronics Divisions' ability to efficiently recover, process, and analyze multiple sources of recorded information, particularly for major investigations.

**International Advocacy**

Engineers from the Vehicle Recorder and Electronics Divisions participated in several international advocacy efforts in FY 2016. The NTSB was represented on the Radio Technical Commission for Aeronautics/European Organization for Civil Aviation Equipment working group that is developing standards for a next-generation emergency locator transmitter as well as the ICAO Flight Recorder Panel working group that is responsible for proposing updates to international standards and recommended practices.

***Vehicle Performance Division***

In a typical year, Vehicle Performance staff members produce more than 50 study reports and animations, launch to accident sites to acquire evidence for performance

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reports, and participate in the development of safety recommendations and modal accident reports.

**Runway Excursion During Landing, Delta Air Lines Flight 1086, Boeing MD-88  
New York, New York  
March 5, 2015**

Delta Air Lines flight 1086, a Boeing MD-88 flying from Atlanta, Georgia, to New York, New York, exited the left side of runway 13, struck a perimeter fence with its left wing, and came to rest with its nose on an embankment. One staff member evaluated the forces and moments on the airplane as a result of its configuration and operation to determine the reason the airplane could not be kept on the runway.

Report Adopted: September 13, 2016

**Collision between Bulk Carrier *Conti Peridot* and Tanker *Carla Maersk* Houston  
Ship Channel  
Morgan's Point, Texas  
March 9, 2015**

The inbound Liberian-registered freighter *Conti Peridot* collided with the outbound Danish-registered tanker *Carla Maersk* in the Houston Ship Channel. Staff created an animation depicting the sequence of events during the accident.

Report Adopted: June 20, 2016

**Aerodynamic Stall and Loss of Control During Approach, Embraer EMB-500  
Gaithersburg, Maryland  
December 8, 2014**

An EMB-500 impacted terrain and three houses about 0.75 miles short of runway 14 while on approach to Montgomery County Airpark. One staff member evaluated the performance of the airplane and extracted the lift coefficient during the flight to investigate the possibility that the airplane stalled as a result of flying through icing conditions.

Report Adopted: June 7, 2016

**Derailment of Amtrak Passenger Train 188  
Philadelphia, Pennsylvania  
May 12, 2015**

Amtrak passenger train 188 derailed traveling 106 mph on a high-degree curve with a permanent speed restriction of 50 mph near Frankford Junction in Philadelphia. One staff member created an animation to show how those injured in the accident were dispersed

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among 10 local area hospitals and what a more even distribution of patients at the hospitals might have looked like.

Report Adopted: May 17, 2016

**WMATA L’Enfant Plaza Station Electrical Arcing and Smoke Accident  
Washington, DC  
January 12, 2015**

A WMATA train with about 380 passengers on board encountered heavy smoke and stopped while traveling in a tunnel near L’Enfant Plaza station. One staff member directed a review of the civil engineering state of good repair of the WMATA tunnel system. A second staff member served as the hearing officer for the investigative hearing for the accident. A third staff member created an animation depicting the sequence of events in the accident, which was shown at the investigative hearing and updated for the Board meeting.

Report Adopted: May 3, 2016

**Truck-Tractor Semitrailer Median Crossover Collision With Medium-Size Bus on  
Interstate 35  
Davis, Oklahoma  
September 26, 2014**

A truck-tractor crossed the center median and collided with a medium-size bus. One staff member performed laser scanning of the site and accident vehicles and aided in the evaluation of the crashworthiness of the medium-size bus. A second staff member simulated the motions of the vehicles and evaluated sight lines. A third staff member created an animation of the sequence of events in the accident that was shown at the Board meeting.

Report Adopted: November 17, 2015

**Selected Issues in Passenger Vehicle Tire Safety  
Special Investigation Report, HS  
October 27, 2015**

The NTSB investigated four tire-related vehicle crashes that resulted in 12 fatalities and 42 injuries. The NTSB also held a Passenger Vehicle Tire Safety Symposium on December 9-10, 2014, to learn more about tire-related accidents. One staff member evaluated the changes to vehicle performance that are caused by tire failures, participated in the symposium, and gave a presentation at the Board meeting.

Report Adopted: October 27, 2015

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**New Jersey Transit Train Impact with Platform  
Hoboken, New Jersey  
September 29, 2016**

New Jersey Transit train 1614 failed to stop, overrode a bumping post at the end of track 5, and struck a wall of the New Jersey Transit Hoboken Terminal. One staff member is using laser scanning to document the accident scene, the lead car in the train, and a similar exemplar car.

**In-flight Breakup During Test Flight  
Italy, Texas  
July 6, 2016**

During a developmental test flight, an experimental Bell 525 helicopter broke up in flight and impacted terrain. One staff member is evaluating the aeroelastic and structural dynamics that preceded the accident and comparing data from the accident flight to data from prior test flights.

**Tesla Model S Collision with Truck-Tractor Semitrailer Combination Vehicle  
Williston, Florida  
May 7, 2016**

A 2015 Tesla Model S, traveling eastbound on US Highway 27A, struck and passed beneath a 2014 Freightliner Cascadia truck-tractor in combination with a 53-foot semitrailer. Three staff members are participating in the investigation to aid in understanding the dynamics of the crash and the role of the automatic control system in the accident.

**Motorcoach Impact With a Concrete Barrier  
San Jose, California  
January 19, 2016**

A Greyhound motorcoach struck a barrier in a gore area of US Highway 101 and overturned. One staff member performed laser scanning of the accident site and vehicle, identified a potential safety issue in the design of the driver's seat attachment, and is performing a biomechanics study to evaluate injury causes and prevention possibilities. In support of the biomechanics study, a second staff member is evaluating video evidence to aid in calculating the forces encountered during the crash.

**Crash During Nonprecision Instrument Approach to Landing, Execuflight Flight  
1526, British Aerospace HS 125-700A  
Akron, Ohio  
November 10, 2015**

A British Aerospace Hawker 125 departed controlled flight while on approach to landing at Akron Fulton International Airport and impacted an apartment building. One staff member evaluated the aircraft performance during the approach to landing.

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**Derailment of Amtrak Train 55  
Northfield, Vermont  
October 5, 2015**

A southbound train encountered a rock slide on the tracks, resulting in the derailment of the lead locomotive and five cars. One staff member was launched to the accident site to evaluate the circumstances of the rock slide and document the rock slide mitigation strategies used by the Vermont highway department.

**Amphibious Passenger Vehicle DUCK 6 Lane Crossover Collision With Motorcoach  
on State Route 99, Aurora Bridge  
Seattle, Washington  
September 24, 2015**

A motorcoach was struck by a 1945 DUCK amphibious military vehicle modified for tour operations. One staff member performed finite element modeling to evaluate the stresses in the DUCK axle (which fractured in the accident) and associated components.

**Midair Collision  
San Diego, California  
August 16, 2015**

A Cessna 172M and an experimental North American Rockwell NA265-60SC Sabreliner collided in midair about 1 mile northeast of Brown Field Municipal Airport. One staff member calculated the position and orientation of each aircraft and used laser scans of exemplar airplanes to determine the ability of the pilot in each aircraft to detect the other aircraft. The same staff member then simulated the views from each cockpit during the accident sequence and also simulated the information that could be made available to each pilot with existing technology, which could have provided early alerting and prevented the collision.

**Midair Collision  
Moncks Corner, South Carolina  
July 7, 2015**

A Cessna 150M and a Lockheed Martin F-16CM, operated by the USAF, collided in midair near Moncks Corner, South Carolina. One staff member calculated the position and orientation of each aircraft and used laser scans of exemplar airplanes to determine the ability of the pilot in each aircraft to detect the other aircraft. The same staff member then simulated the views from each cockpit during the accident sequence and also simulated the information that could be made available to each pilot with existing technology, which could have provided early alerting and prevented the collision.



**Embraer EMB-505 Runway Overrun**  
**Conroe, Texas**  
**September 19, 2014**

An Embraer EMB-505 airplane was substantially damaged after overrunning the runway while landing during moderate to heavy rain at Lonestar Executive Airport. One staff member evaluated the stopping performance of the airplane and correlated the results with the stopping performance observed in other wet runway overruns.

**School Bus Roadway Departure**  
**Anaheim, California**  
**April 24, 2014**

A 2012 Blue Bird 78-passenger All American school bus equipped with lap/shoulder belts at all seats departed the roadway and impacted a light pole and trees. One staff member evaluated the effectiveness of the lap/shoulder belts through biomechanical simulations and also evaluated the capability of the onboard video recording system installed in the bus.

**Accident Involving Two Freight Trains**  
**Casselton, North Dakota**  
**December 30, 2013**

A westbound BNSF grain train derailed near Casselton, North Dakota, leading to a postcrash fire. One staff member used vehicle simulations to evaluate train stopping performance for different types of brake systems. That work has been extended to quantify how many cars would be stopped short of the point of derailment and how much the kinetic energy of the cars would be reduced if trains were equipped with advanced braking systems.

**Rear Seat Safety in Passenger Vehicles Workshop**  
**April 26, 2016**

The workshop consisted of opening presentations, two facilitated breakout sessions, and a final summary session. Topics addressed included a number of aspects of rear seat safety in passenger vehicles, such as current requirements for rear occupant protection, research on ways to improve rear seat safety, vehicle technologies available now to reduce injuries and fatalities, and courses of action that industry has undertaken to address rear seat safety in passenger vehicles. One staff member participated in the workshop and served as a facilitator for the breakout sessions.

**Technological Upgrades**

The Vehicle Performance Division continues to upgrade capabilities to acquire and evaluate data, simulate vehicle and occupant motion, and develop animations to

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communicate the circumstances of accidents to the public. Listed below are some examples of how technological upgrades have been used by the division:

- Recently acquired helicopter simulation software was used to evaluate the controllability of an Airbus Helicopter AS-350 during takeoff in a crosswind.
- Software developed for the FRA was used to simulate the stopping performance of trains equipped with different braking systems.
- New cameras and photogrammetry software have been tested for their ability to quickly acquire three-dimensional accident scene data for a study of pedestrian accidents.
- Survey-grade position and image data were captured at an accident site in Akron, Ohio, using one of four hand-held Global Navigation Satellite System/camera/laser-rangefinder devices acquired for this purpose.
- A desktop aircraft simulation tool was used to evaluate the views from the cockpits of airplanes involved in two midair collisions; the cockpit geometry was determined using laser scans of exemplar airplanes. Also for the midair collisions, specialized software was written to simulate cockpit displays that could have provided early warnings to the pilots if the airplanes had been equipped with available technology.
- An additional next-generation laser scanner and new hand-held laser scanners were acquired and used to document vehicles and environments in highway and railroad accidents.
- An eye-tracking system was installed in our highway driving simulator to be able to determine where the driver's attention is focused.
- New software has been acquired to calculate fatigue crack growth, both within the ABAQUS finite element program and separately for simplified geometries in a program called NASGRO.

### ***Medical Investigative Consultation***

Medical staff participate in numerous NTSB accident investigations in all transportation modes each year, evaluating and addressing medical issues through formal factual and analytical reports, safety recommendations, coordination with other agencies, and formal presentations to the NTSB and external audiences. Annually, medical staff complete more than 110 medical accident investigations and produce more than 170 reports.

#### **Derailment of Amtrak Passenger Train 188 Philadelphia, Pennsylvania May 12, 2015**

Amtrak passenger train 188 derailed traveling 106 mph on a high-degree curve with a permanent speed restriction of 50 mph near Frankford Junction in Philadelphia. A medical

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staff member was launched to the scene and, over the next year, performed an evaluation of the train engineer for medical conditions or medications that could have contributed to the accident. In addition, medical staff developed a procedure to document injury descriptions using internationally accepted standards. Staff also analyzed the complex emergency medical response to the large mass casualty incident that resulted from the derailment.

Report Adopted: May 17, 2016

**Truck-Tractor Semitrailer Median Crossover Collision With Medium-Size Bus on Interstate 35  
Davis, Oklahoma  
September 26, 2014**

A truck-tractor crossed the center median and collided with a medium-size bus. Medical staff was launched to the scene, performed a medical investigation of the truck driver, and participated in the evaluation of injuries to the bus occupants. NTSB determined that the probable cause of the accident was the failure of the truck-tractor driver to control his vehicle due to incapacitation likely stemming from his use of synthetic cannabinoids.

Report Adopted: November 17, 2015

**Collision of an Amtrak Passenger Train With Rail Maintenance Backhoe  
Chester, Pennsylvania  
April 3, 2016**

An Amtrak passenger train traveling 106 mph in a 110 mph zone struck a backhoe operated by roadway workers on the adjacent track. Medical staff is investigating whether medical conditions, medications, or substance use may have contributed to the cause of the accident and working with survival factors investigators to describe the injuries.

**Motorcoach Impact With a Concrete Barrier  
San Jose, California  
January 19, 2016**

A Greyhound motorcoach struck a barrier in a gore area of US Highway 101 and overturned. Medical staff is evaluating whether the bus driver's medical conditions may have contributed to the accident and is participating in the survival factors investigation.

**Amphibious Passenger Vehicle DUCK 6 Lane Crossover Collision With Motorcoach on State Route 99, Aurora Bridge  
Seattle, Washington  
September 24, 2015**

A motorcoach was struck by a 1945 DUCK amphibious military vehicle modified for tour operations. Medical staff evaluated the operators for medical conditions.

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**Multivehicle Work Zone Crash on Interstate 75  
Chattanooga, Tennessee  
June 25, 2015**

A combination truck-tractor and semitrailer struck a line of slowed traffic while approaching a highway work zone. Medical staff identified that the truck driver was impaired by the effects of methamphetamine at the time of the accident.

**Grade Crossing Accident involving Metro-North Train and Passenger Vehicle  
Valhalla, New York  
February 3, 2015**

A Metro-North commuter train struck a passenger vehicle at an active highway/railroad grade crossing. Medical staff was launched to the scene and began an evaluation of the mechanisms of injury to the train occupants and vehicle driver. Medical staff analyzed medical information related to the vehicle driver to address the possibility of a medical condition contributing to the accident. Medical staff also worked with the HS survival factors group to understand the mechanisms of injury.

**Safety Recommendation Report  
Improving Pilot and Aviation Medical Examiner Knowledge of Cataract Hazards**

A GA accident occurred on December 26, 2013, in which a pilot with known and untreated cataracts was unable to safely complete a landing in his Cessna 172 at a familiar airport while in dark night visual conditions. After the medical investigation, which identified the inability to see accurately in dark night conditions as causal in the accident, medical factors staff developed a recommendation report describing the medical findings and operational information leading to two recommendations to the FAA and one to the Aircraft Owners and Pilots Association.

Report Adopted: July 14, 2016

**Technological Upgrades**

NTSB has invested in improving the process of medical investigations. Medical staff have been working through FY 2015 and FY 2016 to develop agency-wide software to support medical investigations, including managing workflow as well as the large amount of data and detailed information required for medical investigations.

**Medical Support**

In addition to performing accident investigations in FY 2016, medical staff supported transportation safety by giving 15 regional or national presentations to a variety of outside groups and publishing 3 papers in peer-reviewed journals.

## TRAINING CENTER

<b>Training Center</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$936	4
FY 2018 Request	\$949	4
Increase/Decrease	\$13	0

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. No program changes are planned.

### Program Description

The NTSB Training Center is an organizational component of the Office of the Managing Director. Budget exhibits have historically shown these activities as program resources outside the policy and direction line that incorporates the Office of the Managing Director. The Training Center is responsible for training our partners in investigations, training internal staff, developing training plans, and overseeing the development and implementation of workforce development programs.

### Accomplishments and Workload

The Training Center continues to move forward in its evaluation of courses to further refine the offerings and improve instruction in all areas of technical, investigative, and mission support. The Training Center offered new courses in investigative skills, specifically targeting processes, procedures, and technical issues that are critical to the NTSB mission of accident investigation (for example, a three-course offering on Witness Interviewing Skills and another on Digital Mobile Forensics). These courses are generally open only to NTSB investigative and support staff.

FY 2016 is the NTSB's third year using the Talent Management System (TMS), which was introduced in FY 2013 as a means of scheduling, approving, providing, and evaluating all staff training. Content and use of the system continues to expand. The TMS tracks and maintains a permanent record of all staff education and training activities and provides a valuable tool for developing and tracking staff competencies and skills. It can also be used as an online training venue as well as a course evaluation tool.

Full-time training officers and advisers coordinate the development of group training by regularly conducting needs analyses and assessments for each office and also focusing on longer term training requirements. Workforce development course offerings undergo continuous evaluation and improvement to adapt to the NTSB's changing needs and priorities. The skills developed and enhanced by workforce development training are

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highly transferable and add significant value to the investigative processes as well as mission support functions.

Plans for the Training Center include the following:

- ***Provide GA forums/symposia:*** Several years ago, the Training Center developed and hosted a Volunteer Pilots Safety Stand Down Day. The success of this safety seminar prompted the Training Center to develop and present seminars on a regular and continuing basis. The NTSB partners with the FAA and other interested groups to develop programs that cover the safety, regulatory, and private aspects of GA safety. Since its inception, the NTSB has produced ten safety seminars on different topics. These have become extremely popular with the aviation community. In November 2016, the Training Center and AS staff delivered a safety seminar in Alaska on loss of control in an effort to address the specific complexities and issues of flying in a challenging geographic area.

Future safety seminars will continue to concentrate on areas of GA operations, which have the highest fatality rates, or trending issues highlighted by increasing number of accidents. As appropriate, the Training Center continues to partner with other federal agencies, including the FAA, and private organizations such as the Airline Owners and Pilots Association, the Experimental Aircraft Association, and the Society of Aviation and Flight Educators.

- ***Increase emphasis on technical training for NTSB investigators:*** We continue to upgrade and refine investigative skills by offering such courses as Root Cause Analysis, System Safety Fundamentals, Mobile Digital Forensics for Investigators, Interviewing Techniques (Basic, Cognitive, and Advanced), Composite Materials, Accident Site Photography, technically advanced aircraft training, Safety Management System Analysis, and tailored Accident Report Writing. The workforce development program continues to offer courses in the areas of communication, time management, and advanced computer skills. Additionally, Training Center staff developed a pilot Externship Program in FY 2016 for AS. Nine investigators were deployed to outside organizations for a period of 1-2 weeks as an effort to develop the skills, knowledge, and abilities of its staff and foster professional relationships within the domestic and international aviation community.
- ***Provide training on occupational and accident site safety and NTSB operations:*** In FY 2016, the NTSB also developed an internal class to educate and inform all NTSB employees on Occupational Safety and Health Administration (OSHA) requirements for their specific jobs; accident site safety and risks; and NTSB operations, processes and procedures.
- ***Roll out new initiative on supervisory skills and training:*** With increasing numbers of new supervisors at the NTSB, the Training Center is developing a program to provide comprehensive supervisory training. In 2015, the Training Center established an NTSB New Supervisor Training Program that outlined and set up classes so that a new

supervisor could quickly develop the skills necessary to perform the job. In 2016 and early 2017, the Training Center will launch a Supervisory Development Program that current supervisors will have at their fingertips so that they can have quick access to classes to both develop and refine skills that would lead to higher level management and executive positions.

- ***Offer investigation courses for other federal agencies:*** The Training Center is often contacted to develop and present classes for other agencies in aviation accident investigation. Thus far, the Training Center has developed and taught classes for the US Department of Energy and the USCG (two classes in FY 2016 and three classes scheduled in FY 2017). The Training Center is in discussions with the USAF Reserve to develop a specific class for them and continues to present a 2-week class (for the 7<sup>th</sup> year) for the US Army National Guard.
- ***Evaluate and update current courses and develop courses to produce new revenue streams:*** The Training Center continues to examine the possibilities for expanding public course offerings, offered on a fee basis, in other modes such as highway and pipeline, as well as new investigative skills courses, such as the NTSB party process. A course on working with the media at a transportation accident site has been very successful. It is still offered both at the Training Center and on a limited basis at other locations, and demand for this class has been increasing.
- ***Continue to increase awareness of the NTSB and its mission by offering TWA 800 briefings to other federal agencies and groups involved with transportation safety and security.***

***FY 2016 Activities***

<b>Courses With Public Enrollment</b>	<b>Students</b>
<b>Courses at Training Center:</b>	
Aircraft Accident Investigations Orientation for Aviation Professionals (2 course offerings)	72
Accounting for Victims Following Transportation Mass Casualty Incidents: A Course for Emergency Managers, Law Enforcement, Hospitals, and the Medicolegal Community	33
NTSB Helicopter Accident Investigations	33
Accident Site Photography (2 course offerings)	32
Managing Communications During an Aircraft Incident or Accident (2 course offerings)	159
Cognitive Interviewing (2 course offerings)	64
Family Assistance (2 course offerings)	106
Aircraft Accident Investigations (2 course offerings)	84



<b>Courses With Public Enrollment</b>	<b>Students</b>
Pix4Dmapper Software Training	12
<b>Subtotal Courses at Training Center</b>	<b>595</b>
<b>Offsite Courses:</b>	
Managing Communications During a Major Transportation Accident & NTSB Investigation Process: Communication and Signal Exhibition - Argentinian Junta de Investigacion de Accidentes de Aviacion Civil (JIAAC)	275
Managing Communications During a Major Transportation Accident - Delta Air Lines	49
Managing Communications During a Major Transportation Accident – University Corporation for Atmospheric Research (UCAR)	64
Managing Communications During a Major Transportation Accident - San Diego	50
<b>Subtotal Off Site Courses</b>	<b>438</b>
<b>Private Courses at Training Center:</b>	
Aviation Accident Investigation - Department of Energy	32
Aviation Accident Investigation - USCG (2 course offerings)	100
Aviation Accident Investigation - US Army National Guard (ANG)	45
<b>Subtotal Private Courses at Training Center</b>	<b>177</b>
<b>Total (October 1, 2015 – September 30, 2016)</b>	<b>1,210</b>

<b>Courses Conducted Exclusively for NTSB Employees</b>	<b>Students</b>
25 Things You Didn't Know PowerPoint Could Do	42
Accident Report Writing	17
American Heart Association CPR/AED	7
Audio Books	45
Aviation Externships	9
Basic Interviewing	17
Cell Phone Forensics (2 course offerings)	31
Cessna G-1000	4
Civil Treatment for Leaders (3 course offerings)	65
Confined Space Entry	4
Contracting Officer Representative	22



<b>Courses Conducted Exclusively for NTSB Employees</b>	<b>Students</b>
Crane Operator	3
Forklift Operator	2
Graphic Design for Non-Graphic Designers	31
Hazwoper 40-Hour	12
Hazwoper Refresher	6
Integrated Appropriations Law Seminar (2 course offerings)	60
Lead Investigator Course	17
Leadership Development Series Alternative Dispute Resolution (ADR)	14
Leadership Development Series Special Hiring Authorities	18
Marine Confined Space	17
Media Training for NTSB Investigators	13
NTSB Advocacy	20
NTSB Ethics (5 course offerings)	446
NTSB Group Feedback Workshop	10
NTSB Operations, Occupational and Site Safety	11
NTSB Purchase Card Program Overview (5 course offerings)	173
OSHA 6000	20
PowerPoint for Graphic Design	15
Problem Solving for Effective Decision Making	7
Prohibited Personnel Practices	53
Retirement Planning	37
Root Cause Analysis	24
Safety Systems for NTSB Investigators	15
Technical Presentation Skills	13
The New IQ: We are Safer Together (6 course offerings)	178
Time Management	43
Trench Safety	5

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<b>Courses Conducted Exclusively for NTSB Employees</b>	<b>Students</b>
Uncovering the Secrets of Finding and Applying to Jobs in the Federal Government	25
Write and Speak Like the News	16
<b>Total (October 1, 2015 – September 30, 2016)</b>	<b>1,567</b>

## ADMINISTRATIVE LAW JUDGES

Administrative Law Judges	(\$000s)	FTEs
FY 2017 Estimate	\$2,049	8
FY 2018 Request	\$2,075	8
Increase/Decrease	\$26	0

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. No program changes are planned.

### Program Description

The NTSB serves as the “court of appeals” for airmen, mechanics, or mariners whenever the FAA or the USCG take a certificate action. The agency’s administrative law judges hear, consider, and issue initial decisions on administrative appeals regarding FAA aviation enforcement actions. Included are appeals of the following:

- Orders issued by the FAA Administrator amending, modifying, suspending, or revoking, in whole or in part, certificates of airmen, air agencies, and air carriers for alleged violations of the *Federal Aviation Regulations* or for lack of qualifications.
- FAA actions denying applications for the issuance or renewal of airmen certificates.
- Certain FAA civil penalty orders issued against individuals, pilots, flight engineers, mechanics, or repairmen where the amount in dispute is less than \$50,000.

The judges also adjudicate claims under the Equal Access to Justice Act for fees and expenses stemming from FAA certificate and civil penalty actions.

The NTSB currently has three judges assigned to headquarters in Washington, DC (one of whom is a full-time teleworker in Arlington, Texas) and one vacancy. The judges hold hearings primarily based on their circuit assignments. The Pilot’s Bill of Rights, Public Law No. 112-53 (August 3, 2012), requires judges to apply the Federal Rules of Evidence and Federal Rules of Civil Procedure to their proceedings. Either the certificate holder or the FAA can appeal a judge’s decision in these cases to the five-member Board. The Board’s review on appeal of an administrative law judge’s decision is based on the record of the proceeding, which includes hearing testimony (transcript), exhibits, the judge’s decision, and appeal briefs submitted by the parties.

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The FAA has the right to appeal the Board’s decisions to the US Court of Appeals when it determines that the decisions “will have a significant adverse impact” with respect to aviation safety duties and powers designated to be carried out by the FAA. Under the Pilot’s Bill of Rights, airmen and mechanics now have the right to appeal all adverse Board decisions to a US District Court or to a US Court of Appeals. The District Court’s review of the Board’s decision is based on the evidence from the record before the Board, including hearing testimony, transcripts, exhibits, decisions, and briefs submitted by the parties. The Court of Appeals has the power to affirm, modify, or set aside the decision, in whole or in part, or, if the need is determined, to order further proceedings by the Board. The decision of the Court of Appeals is subject to review by the US Supreme Court on writ of certiorari.

Section 716 of the Aviation Investment and Reform Act for the 21st Century, Public Law 106-181 (April 5, 2000), expanded the NTSB’s jurisdiction to include, upon petition by the affected certificate holder, reviews of FAA designations of safety enforcement actions as emergencies that require the order to be effective immediately. The Board has delegated this review authority to its administrative law judges. However, in the event of an appeal to the Board from a law judge’s decision on the merits of the emergency or other immediately effective order, the Board may, at its discretion, note in its order disposing of the appeal its views on the law judge’s ruling on the petition, and such views serve as binding precedent in all future cases. The Pilot’s Bill of Rights provides for substantive independent and expedited review by the US District Court of any decision by the FAA Administrator to make such an order effective immediately.

Marine certificate actions are heard first by the USCG administrative law judges and may be appealed to the Commandant of the USCG. The ruling of the Commandant may then be appealed to the NTSB. The same higher appellate process is followed for marine certificate actions.

## Accomplishments and Workload

During the period of October 1, 2015, through September 30, 2016, the Office of Administrative Law Judges accomplished the following:

- Met its goal of providing notices of hearings at least 30 days before the hearing; 122 notices were provided to appellants.
- Met its goal of conducting hearings and rendering decisions in emergency cases within 30 days of the filing of an appeal; the office rendered decisions on 104 emergency appeals and held 21 emergency hearings.
- Made rulings on 25 petitions challenging the FAA Determination that an Emergency Exists in Air Safety within the 5-day statutory timeframe.
- Issued 173 decisions and held 31 hearings.
- Processed 246 new appeals.

The NTSB issued 20 final decisions (Opinions and Orders) between October 1, 2015, and September 30, 2016, affirming 13, reversing 1, modifying 3, and remanding 3 to the Office of Administrative Law Judges for further proceedings. The NTSB also issued nine orders dismissing appeals, one order denying reconsideration, and two orders granting reconsideration.

## INFORMATION TECHNOLOGY AND SERVICES

<b>Information Technology and Services</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$6,432	26
FY 2018 Request	\$6,067	24
Increase/Decrease	(\$365)	(2)

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. A reduction in staff of 2 FTEs is required to meet the FY 2018 request level. No other program changes are planned.

### Program Description

The Office of the Chief Information Officer (CIO) provides strategic direction and operational support for NTSB information systems, and develops and distributes programs and products for use by the agency and the public. The office consists of four divisions and one program area, as described below.

#### *Computer Services Division*

The Computer Services Division (CSD) provides computer and network services for headquarters and regional offices, including Internet access, web services, e-mail, backup, continuity of operations infrastructure, and disaster recovery. The help desk staff performs a wide range of tasks, including desktop/laptop setup, repair, and replacement; network connectivity; and software installation and upgrades. In short, the CSD is responsible for deploying and maintaining essential systems and services that range from desktop telephones to enterprise storage systems, as well as cell phones and tablets.

#### *Systems Support Division*

The Systems Support Division (SSD) develops, distributes, and maintains agency-specific applications, provides web design and content management, and provides database administration services. Applications include accident data collection, storage, analysis, and dissemination for all modes, as well as management of systems for accident records, safety recommendations, correspondence, FOIA requests, and general administration. This division also develops office-centric applications for modal and/or support office business functions.

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## ***Records Management Division***

The Records Management Division (RMD) maintains the archives of accident investigation files, NTSB reports, and other agency records. It is responsible for fulfilling public requests for information, including FOIA requests; providing training for the docket management system and guidance on redaction policies and techniques; and monitoring the privacy and confidentiality of data and information. This division also provides general records management.

## ***Enterprise Architecture Division***

The Enterprise Architect Division (EAD) supports the NTSB mission and strategic goals by providing a blueprint—in logical or business terms, as well as technology terms—for how the organization operates today, plans to operate in the future, and intends to invest in technology. Enterprise architecture defines the business, processes, and information necessary to operate the business, support technologies, and transitional processes required to implement new technologies in response to changing business needs.

## ***Information Technology (IT) Security Program***

The Chief Information Security Officer (CISO) protects the availability, confidentiality, and integrity of IT resources through the application of requirements specified in OMB Circular A-130, the Federal Information Security Management Act (FISMA), and various US Department of Commerce National Institute of Standards and Technology publications. The IT security program uses a risk-based, cost-effective approach to secure information and systems, identify and resolve current IT security weaknesses and risks, and protect against future vulnerabilities and threats.

## **Accomplishments and Workload**

The Office of the CIO is proud of the accomplishments stated in the following paragraphs and has set greater goals going forward for FY 2017 and FY 2018 to work in partnership with NTSB offices to implement an enterprise-wide secure, solid and flexible technical and application infrastructure, within NTSB and the Cloud, to serve as the foundation to deliver IT-related services that will enhance NTSB's ability to more effectively execute our mission today and tomorrow. This will require first addressing the technical and security infrastructure to allow for the secure and seamless flow of data across our regional offices, headquarters, and remote locations and with our partners/stakeholders. Related efforts include greater use of Cloud services and the implementation of advanced productivity tools. An analysis and plan will be developed to enhance the ability of NTSB employees to work remotely and to determine the appropriate advanced analytic tools and the internal and external data repositories.

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## ***Computer Services Division***

The CSD successfully resolved more than 2,900 help desk requests between October 1, 2015, and September 30, 2016, for NTSB's distributed locations (headquarters, regional offices, and teleworkers). The division's IT specialists also launched on multiple major accident investigations to further assist members and staff when on-scene at an investigation. Additionally, the division provided both front-end and back-end computing services to the agency with minimal downtime due to unplanned outages. The CSD assisted with the transition to, and the support of, the Office 365 suite of applications. CSD also upgraded the agency's baseline desktop configuration to include Microsoft's Internet Explorer 11 and performed a number of upgrades to insure that systems are running on up-to-date hardware and software. Among the most notable of these upgrades was the intricate transition of the agency's storage system from a legacy to a modern storage area network solution. In further efforts to keep current with developing technology, the CSD developed a baseline configuration for the Microsoft Windows 10 desktop operating system. From a deployment perspective, the division successfully upgraded the entire installation of agency cell phones from iPhone 5s to iPhone 6s with no appreciable downtime in business operations.

## ***Systems Support Division***

As anticipated, the SSD is on schedule to launch the Product Management Application in early FY 2017, a replacement to the legacy Correspondence, Notations and Safety Recommendations application, which over time became difficult to maintain and expand. The scope and collaborative effort of the Product Management Application project was unprecedented at the agency, with the new application providing a platform from which future enterprise-wide applications can interact.

Along with other Office of the CIO divisions, the SSD addresses multiple help desk tickets per day and is in the process of updating the change management component of its Service/Incident Request application. Additionally, the SSD monitors the health of the agency's expanding application and database inventory, adds enhancements and troubleshoots as requested, and assists the other divisions in implementing manufacturer operating system/database updates and security patches to both internal and public-facing infrastructure.

## ***Records Management Division***

The RMD developed and implemented a records inventory database to maintain all NTSB records, which will include record schedules as approved by the National Archives and Records Administration. The division posted 1,365 accident dockets from October 1, 2015, through September 30, 2016, which resulted in 13,465 accident dockets now available on the NTSB public website. Also during this time period, the division received 471 FOIA requests and processed 299 FOIA requests.



## *Enterprise Architecture Division*

The EAD continued providing guidance and the design oversight and technical advice in all the software development efforts throughout the agency. The division negotiated and consolidated Microsoft Enterprise Agreements and the Adobe Enterprise Licensing agreement resulting in savings. Under EAD's oversight, ongoing Office 365 implementation is on track. Office 365 implementation will result in increased communication and collaboration throughout the agency and also will pave the way towards a unified communication platform. The division is currently leading the extending ADMS functionality for other modes with a goal of standardizing the investigative process across modes. Division is also providing technical advisory support to projects like NTSB.GOV web site and the web-based Emergency Operations Center.

## *IT Security Program*

The CISO continued to ensure NTSB compliance with FISMA by maintaining a continuous monitoring program, which provides ongoing cybersecurity and compliance reviews of network and computer assets. In addition, certification and accreditation for the NTSB general support, accident investigation, and laboratory support systems remain current, and the NTSB completed a favorable FY 2016 FISMA review. For the sixth consecutive year, the Inspector General's audit found that the NTSB has developed and implemented, based upon assessed risk, an IT security program that complies with FISMA requirements.

## ADMINISTRATION

<b>Administration</b>	<b>(\$000s)</b>	<b>FTEs</b>
FY 2017 Estimate	\$9,159	36
FY 2018 Request	\$8,602	33
Increase/Decrease	(\$557)	(3)

### Overview of the Request

The funding level for this program activity includes increases for a 1.9 percent pay raise for existing staff and a 2.0 percent non-pay inflation factor. A reduction in staff of 3 FTEs is required to meet the FY 2018 request level. No other program changes are planned.

### Program Description

The Office of Administration coordinates and manages infrastructure and support activities for the NTSB. This office provides support in the areas of human resource management, labor relations, facilities management, safety, security, acquisition, and lease management. Physical inventory, shipping and receiving, and management of the NTSB conference center and training center facilities are also major functions. Four divisions carry out the office's work: Administrative Operations and Security, Acquisition and Lease Management, Human Resources (HR), and Safety.

### Accomplishments and Workload

#### *Administrative Operations and Security*

The Office of Administration maintains an agreement with the GSA to meet the requirements of Homeland Security Presidential Directive 12 for personal identity verification credentials for all employees and contractors. This agreement also continues the implementation of the physical access control system upgrades for the NTSB headquarters, regional offices, and Training Center to comply with the new directive program requirements.

During FY 2016, the Administrative Operations and Security Division completed the 2-day FY 2016 COOP Eagle Horizon drill. The drill was evaluated by our Federal Emergency Management Agency partner agency, the Federal Housing Finance Agency and the NTSB received a successful evaluation rating for the drill. The division also initiated and developed the Training Center's audiovisual upgrades plan to replace aged and failing equipment with new and current technology components. These upgrades are scheduled to be completed in December 2016 and will ensure future reliable service for Training Center classes and events.

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## ***Acquisition and Lease Management***

The Acquisition and Lease Management Division manages the NTSB acquisition program and provides best-value business solutions. The division is a full-service acquisition organization that awards and administers contracts and agreements, manages the purchase card program, awards and manages real property leases for both NTSB headquarters and regional offices, and provides essential acquisition guidance and training. In FY 2016, the division executed approximately 368 contract actions to support the mission of the agency. The division also played an important role in NTSB's investigation of the sinking of the *El Faro* by establishing interagency agreements with multiple federal agencies for search and recovery services as well as to perform sonar scanning and collect video and photographic documentation of the vessel wreckage.

## ***Human Resources***

In FY 2016, the HR Division collaborated with the Offices of the CFO and the Managing Director, and program offices throughout the agency, to recruit and hire 41 new employees for mission-critical and support positions. Using the experience gained in FY 2015 with the Federal Pathways Program, HR expanded the program for hiring summer interns to employ 18 students and to enhance their onboarding experience with briefings and activities about the NTSB's mission and goals.

HR developed a position management policy and related procedures that are intended to improve the ability to conduct workforce analysis and support agency discussions on the strategic management of office-level and agency FTEs and positions. With oversight by a position management panel, office directors will assess workforce skills and knowledge against mission requirements and potential losses to plan for future hiring and organizational changes.

HR has increased the use of technology to address issues related to efficiency and effectiveness. The division has realized better employee and supervisor accountability for hours of work and overtime claimed. The FY 2016 transition to an upgraded version of USAStaffing, an automated recruitment system, resulted in an improved applicant and HR Specialist recruitment experience. Similarly, the implementation of the Office of Personnel Management's (OPM) automated performance management system, USAPerformance, is planned for January 2017. This automated system will manage functions to increase efficiencies, reduce duplicate efforts, document approvals more effectively, and increase adherence to recordkeeping procedures with an automatic release to Electronic Official Personnel File.

During the FY, HR conducted a review and certification of performance plans for senior executive service, senior level, and general schedule employees. For senior level employees, HR received approval from OPM for continued certification of our performance management system through September 12, 2018. Through a designated HR resource, supervisors received hands-on assistance developing performance standards, conducting feedback sessions, and handling difficult situations. After reviewing the final

plans for the general schedule employees, the division provided feedback and recommendations to senior leaders on improvements and corrections. The results of the review will also be used to develop agency specific training for supervisors and employees on SMART (Specific, Measurable, Attainable, Relevant, and Timely) goals and measures, clear expectations, and feedback.

As in past years, employees at all levels in the organization were encouraged to participate in the annual OPM employee viewpoint survey. The 2016 NTSB response rate of 70.3 percent significantly exceeded both the NTSB's consistently high 60-percentile performance over the last 5 years and the government-wide response rate. An increasingly inclusive organizational culture at the NTSB, as measured by the New Inclusion Quotient, is evidenced by the 2016 New Inclusion Quotient of 62 percent when compared to 2015's 59 percent. Beginning in 2016, office-level results are available so that senior leaders and managers can identify actions that they can take to improve employee engagement and satisfaction.

## ***Safety***

The Safety Division leads the NTSB Safety Committee and Safety Council in continually improving the agency's safety program. The NTSB's Occupational Safety and Health Program (OSHP) was fully implemented with the introduction of the OSHP Manual in 2014. In 2015, the division completed the first OSHP Audit and provided its findings to OSHA in the *2015 Annual Report to OSHA*. In 2016, the division continued to lead efforts to improve the safety culture through internal audits, increased safety-related training, and a focus on the Fatigue Risk Management Program.

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## APPENDIX A: MOST WANTED LIST

The NTSB issued its first Most Wanted List (MWL) of Transportation Safety Improvements in October 1990 to highlight specific recommendations that could significantly reduce transportation accidents, deaths, and injuries. The current MWL highlights up to 10 general safety issues that are supported by safety recommendations. We believe that this broader approach of focusing on issue areas rather than individual recommendations provides greater opportunity to effect change. See <http://www.nts.gov/safety/mwl/Pages/> for more information on the current MWL issue areas.

Listed below are the 10 MWL issue areas that the NTSB is currently highlighting through its advocacy efforts:

### **INCREASE IMPLEMENTATION OF COLLISION AVOIDANCE TECHNOLOGIES**

Humans make mistakes, even in transportation. Transportation operators must always walk a demanding line of alertness and vigilance, but collision avoidance technologies can provide a lifesaving safety net. Technologies such as collision warning and autonomous emergency braking in highway vehicles and positive train control in trains will result in fewer accidents, fewer injuries, and fewer lives lost. These technologies are available today. They should be implemented today.

### **ENSURE THE SAFE SHIPMENT OF HAZARDOUS MATERIALS**

Increased volumes of hazardous materials—especially flammable liquids—are moving by rail. Meanwhile, expanded lithium battery use poses a threat to safe airplane operation. Hazardous materials must be moved safely to avoid deadly accidents and environmental damage. It is also critical to renew focus on proper emergency response training and notification as well as adequate resource allocation to ensure first responders are prepared to handle hazardous materials in the event of an accident.

### **PREVENT LOSS OF CONTROL IN FLIGHT IN GENERAL AVIATION**

Nearly half of all general aviation accidents are caused by loss of control in flight. To prevent unintended departures from flight and better manage stalls, pilots need more training and a better awareness of the technologies that can help prevent these tragedies. NTSB data from 2008–2014 confirm that loss of control continues to be the biggest killer in general aviation. Better training on how to eliminate distraction, avoid stalls, and manage weather issues will put pilots back in control and give them better command of their outcomes.

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## **IMPROVE RAIL TRANSIT SAFETY OVERSIGHT**

Ineffective safety oversight is a contributing factor in many rail transit accidents. It is critically important that rail transit systems be constantly monitored and improved to maintain and enhance safety so that small problems can be caught before they become big ones. Without changes in public transit system oversight, accidents will continue to happen.

## **END ALCOHOL AND OTHER DRUG IMPAIRMENT IN TRANSPORTATION**

Alcohol is one of many impairing drugs and continues to contribute to transportation fatalities. Marijuana decriminalization, increasing use of dangerous synthetic drugs, and a dramatic rise in over-the-counter and prescription medication use and abuse mean that impaired vehicle operation has become a more complex problem than ever. Every transportation death caused by alcohol or other drug impairment is preventable. Ending the epidemic of impairment in transportation depends on passing and enforcing laws and educating the public.

## **REDUCE FATIGUE-RELATED ACCIDENTS**

Fatigue can be just as deadly in transportation as alcohol and drug impairment, and fatigued drivers and operators regularly cause accidents. Finding and treating fatigue-related medical issues and knowing the fatiguing effects of medications are part of the solution. Ultimately, fatigue-related accidents can be prevented if drivers, commercial vehicle operators, and safety-critical personnel get adequate rest.

## **REQUIRE MEDICAL FITNESS**

Operators, maintenance personnel, and other safety-critical transportation professionals must be medically fit to keep the public safe. Company owners and government regulators must develop policies to ensure that safety-critical personnel are medically fit for duty, and transportation professionals have a personal responsibility to ensure their own health and welfare.

## **ELIMINATE DISTRACTIONS**

In transportation, distraction kills. Drivers and operators in all modes of transportation must keep their hands, eyes, and minds focused on operating their vehicle. Ultimately, eliminating distractions in transportation will require changes in regulations as well as in driver and operator thinking and behavior.

## **STRENGTHEN OCCUPANT PROTECTION**

Proper use of seat belts and restraints—specifically for young children, even on airplanes—is key to surviving an accident or crash. But the threat does not end there. Once passengers survive a crash due to effective occupant protection, it is important they do not then succumb to postcrash fire or injury caused by structural or debris impacts. To

minimize deaths and injuries in all modes of transportation, occupant protection systems need to be better designed to preserve survivable space and ensure ease of evacuation.

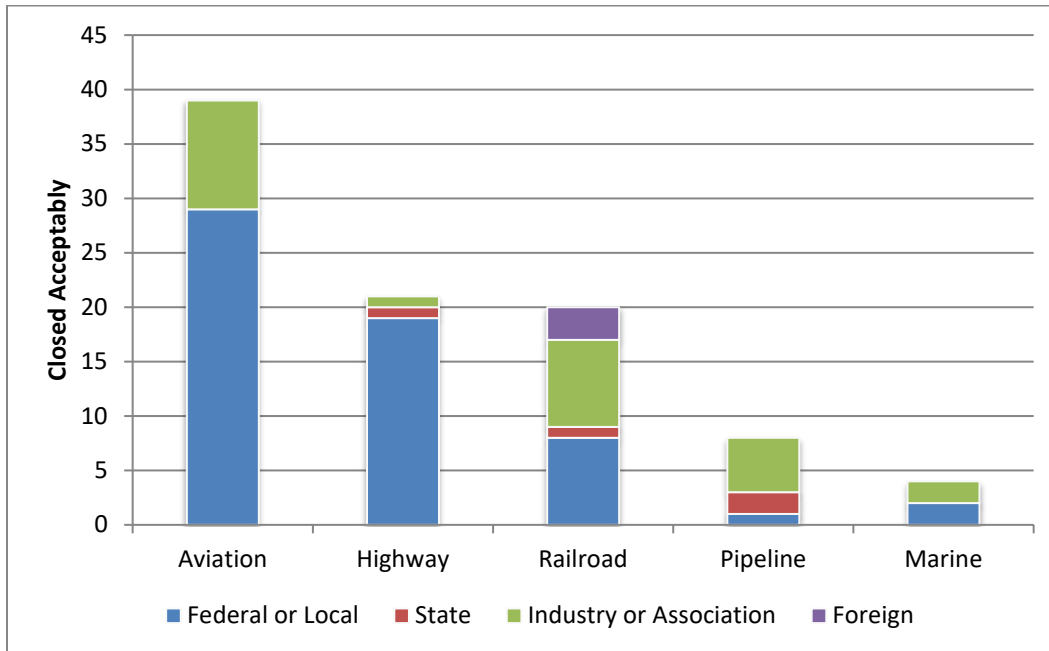
**EXPAND RECORDER USE TO ENHANCE TRANSPORTATION SAFETY**

Data from recorders can help investigators determine the cause of an accident, but an operator can also use recorders to identify and correct unsafe operations and prevent accidents in the first place. However, many vessels, vehicles, trains, and aircraft still lack this readily available and affordable technology. Regulators must mandate recorder use, and operators must proactively install the technology so that valuable data can be used to improve safety.

## APPENDIX B: STATUS OF SAFETY RECOMMENDATIONS

### Recommendations Closed

The chart below breaks out the 92 NTSB recommendations closed acceptably from the beginning of FY 2016 through September 30, 2016, by mode of transportation.



### New Recommendations Issued

The following table displays the number of new recommendations issued by the NTSB from the beginning of FY 2016 through September 30, 2016, by mode of transportation:

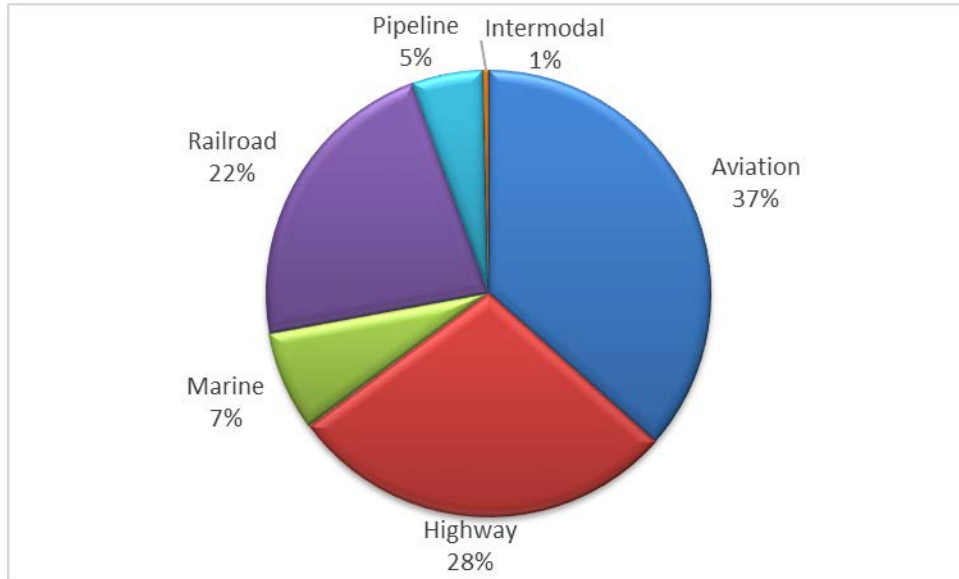
Mode	Federal	State	Industry or Association	Foreign	Total
Aviation	10	0	8	1	19
Highway	17	3	6	0	26
Marine	26	0	6	0	32
Railroad	13	5	29	0	47
Pipeline	0	0	0	0	0
Intermodal	0	0	0	0	0
<b>Total</b>	<b>66</b>	<b>8</b>	<b>49</b>	<b>1</b>	<b>124</b>



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## Open Recommendations

The chart below displays the distribution of the 1,065 open safety recommendations by transportation mode as of September 30, 2016.



## APPENDIX C: AVIATION SAFETY REGIONAL OFFICES

	Eastern Region	Central Region	Western Pacific Region	Alaska Region
Coverage Area	<p>Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Mississippi, Alabama, Georgia, and Florida, as well as the District of Columbia, Puerto Rico, and the US Virgin Islands</p>	<p>Ohio, Michigan, Indiana, Wisconsin, Illinois, Minnesota, Iowa, Missouri, Arkansas, Louisiana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Wyoming, Colorado, and New Mexico</p>	<p>Montana, Idaho, Utah, Arizona, Nevada, Washington, Oregon, California, and Hawaii, as well as the territories of Guam and American Samoa</p>	<p>Entire state of Alaska</p>
Staff Office Location	<p>Main office: Ashburn, Virginia</p> <p>Satellite work sites: Laconia, New Hampshire; Naples, Miami, and Winter Springs, Florida; Atlanta and Marietta, Georgia; Randolph, New Jersey; New York, New York; Berryville, Clear Brook, and Purcellville, Virginia, Valley Head, Alabama, Cary, Fuquay Varina, Pittsboro, and Zebulon, North Carolina</p>	<p>Main office: Denver, Colorado</p> <p>Satellite work sites: Evergreen, Colorado; Barrington, Bartlett, Burbank, Carol Stream, Geneva, Morris, and Naperville, Illinois; Minneapolis and Rochester, Minnesota; Houston, Mansfield, Arlington, Conroe, and New Braunfels, Texas; and Greenville, Wisconsin</p>	<p>Main office: Federal Way, Washington</p> <p>Satellite work sites: Chandler and Mesa, Arizona; Butte, Montana; Gardena, Desert Hot Springs, Rancho Palos Verdes, San Mateo, San Ramon, Torrance, San Dimas, and Vacaville, California; Portland, Oregon; Lynnwood, Newport, Puyallup, and Seattle Washington; and Kailua, Kona, Hawaii</p>	<p>Main office: Anchorage, Alaska</p>

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## APPENDIX D: HISTORICAL INFORMATION

### NTSB Salaries and Expenses Funding History (in millions)

<b>FY</b>	<b>Amount</b>
2000*	56.8
2001*	62.8
2002*	67.9
2003*	72.0
2004*	73.1
2005*	76.1
2006*	75.9
2007	79.3
2008	84.4
2009	91.0
2010	98.0
2011*	97.8
2012	102.4
2013*	97.0
2014	103.0
2015	104.0
2016	105.2

\* Includes across-the-board rescissions

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## Current Board Members

Name	Board Title	Appointment	Term Expiration
Robert L. Sumwalt	Member*	August 21, 2006	December 31, 2016**
Bella Dinh-Zarr	Member	March 30, 2015	December 31, 2018
Christopher A. Hart	Member	March 15, 2015	December 31, 2017
Earl F. Weener	Member	June 22, 2010	December 31, 2015**
Vacant	Member		

\* Serving as Acting Chairman since March 31, 2017.

\*\* Under 49 U.S.C. section 1111(d), when the term of office of a Board Member ends, the Member may continue to serve until a successor begins service as a Board Member.

## Emergency Fund Activity

<b>Fiscal Year</b>	<b>Appropriations (Rescissions)</b>	<b>Obligation Activity</b>	<b>Balance</b>	<b>Purpose/Source</b>
2000			2,000,000	No Activity
2001			2,000,000	No Activity
2002		491,687	1,508,313	Extraordinary costs related to the crash of American Airlines Flight 587 at Belle Harbor, NY
2003		4,914	1,503,399	Adjustment of FY 2002 Obligations
2004		(138,000)	1,641,399	Adjustment of FY 2002 Obligations
2004	358,601		2,000,000	Appropriation (P.L. 108-199)
2004	(2,116)		1,997,884	Rescission (P.L. 108-199)
2005			1,997,884	No activity
2006			1,997,884	No activity
2007			1,997,884	No activity
2008			1,997,884	No activity
2009			1,997,884	No activity
2010			1,997,884	No activity
2011			1,997,884	No activity
2012			1,997,884	No activity
2013			1,997,884	No activity
2014			1,997,884	No activity
2015			1,997,884	No activity
2016			1,997,884	No activity

## Training Center Costs and Revenues

	FY 2014	FY 2015	FY2016
Earned revenue	1,074,447	797,072	1,057,083
Subleases	577,525	593,329	594,309
<b>Total revenue</b>	<b>1,651,972</b>	<b>1,390,401</b>	<b>1,651,392</b>
Costs:			
Pay	751,481	770,086	839,126
Travel	63,927	96,655	94,029
Contracts	137,729	359,725	269,436
Supplies	37,656	10,105	23,727
Equipment	27,616	0	130,979
Costs before space rental	1,018,409	1,236,571	1,357,297
Space rental	2,659,875	2,670,206	2,675,675
<b>Total operating costs</b>	<b>3,678,284</b>	<b>3,906,777</b>	<b>4,032,972</b>
<b>Overall deficit</b>	<b>2,026,312</b>	<b>2,516,376</b>	<b>2,381,580</b>

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## FTE Staffing FY 2000 - FY 2016

<b>FY</b>	<b>FTE</b>
2000	427
2001	416
2002	426
2003	427
2004	421
2005	417
2006	387
2007	377
2008	388
2009	393
2010	384
2011	403
2012	412
2013	412
2014	402
2015	418
2016	419

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## FTE Staffing at Year End by Headquarters and Field Offices

<b>FY</b>	<b>Headquarters</b>	<b>Regional</b>	<b>Total</b>
2000	346	81	427
2001	345	71	416
2002	337	89	426
2003	329	98	427
2004	314	107	421
2005	308	109	417
2006	286	101	387
2007	292	85	377
2008	286	102	388
2009	293	100	393
2010	283	101	384
2011	296	107	403
2012	304	108	412
2013	307	105	412
2014	299	103	402
2015	307	111	418
2016	304	115	419



## FTE Staffing by State and Region FY 2016

Location	Administrative Law Judges	Aviation Safety	Highway Safety	Information Technology Services	Marine Safety	Administration	Safety Recommendations and Communications	Policy & Direction	Rail, Pipeline & Hazardous Materials	Research & Engineering	Training Center	Total
Alaska		4										4
Colorado		11	2									13
Illinois		8		1					2			11
Indiana									1			1
Louisiana									1			1
Minnesota		2										2
Texas	1	8	6						1			16
Wisconsin		1										1
Alabama		1										1
Connecticut								1				1
Delaware			1									1
Florida		3			1		1					5
Georgia		3										3
Massachusetts			1									1
New Hampshire		1										1
New Jersey		1							1			2
New York		1										1
North Carolina		3										3
Virginia		12		1		1		1	1		3	19
Washington, DC	7	47	18	24	19	32	30	53	27	47	1	304
Arizona		2										2
California		9	1						3			13
Hawaii		1										1
Montana		1										1
Oregon		1										1
Washington		9	1									10
<b>Grand Total</b>	<b>8</b>	<b>129</b>	<b>30</b>	<b>26</b>	<b>20</b>	<b>33</b>	<b>31</b>	<b>55</b>	<b>37</b>	<b>47</b>	<b>4</b>	<b>419</b>

\*Regions:

Alaska
Central
Eastern
Western

## International Investigation Costs\*

### FY 2016

<b>Description</b>	<b>Location</b>	<b>Amount</b>
A Boeing 737-800, operated by FlyDubai, impacted airport terrain during a second approach attempt in bad weather.	Rostov-on-Don, Russia	128,854
During landing, the nose gear steering locked in one direction on a Pegasus Airlines Boeing 737-800, resulting in damage to the nose gear.	Nicosia, Cyprus	95,208
The Sikorsky S76C aircraft was en route when it crashed into a lagoon under unknown circumstances.	Lagos, Nigeria	70,934
Communication was lost with a Socata TBM700, and it impacted the water.	Open Water, Unknown (North of Jamaica)	69,115
An Augusta Westland tilt rotor AW609 experienced loss of control during a test flight.	Tronzano Vercellese, Italy	36,391
A West Atlantic Aircraft Management Bombardier CL-600-2B19 cargo flight crashed in mountainous terrain in Northern Sweden.	Kiruna, Sweden	66,787
While at 36,000 feet, a Boeing 737-400 experienced abnormal decompression during cruise.	Tanegashima, Japan	36,812
A Magnicharter Boeing 737-300 suffered a landing gear collapse after touchdown.	Mexico City, Mexico	27,734
A Mitsubishi Mu-2B-60 crashed while on approach.	Îles-de-la-Madeleine, Quebec, Canada	24,968
A M7 (Swearingen) SA 226 crashed under unknown circumstances near the Queretaro Airport.	Queretaro, Mexico	28,608
A JetBlue Embraer E190 landed with nose gear retracted.	Nassau, Bahamas	36,238
A Boeing 234 helicopter, operated by Columbia Helicopters, impacted the ground shortly after departing.	Pucallpa, Peru	20,519
A Boeing 767-200ER experienced an uncontained engine failure.	Islamabad, Pakistan	18,216
A Boeing 737 and Hawker Siddely HS-125 collided in midair.	Tambacounda, Senegal	17,016
An Airbus A321, operated by Metrojet, crashed en route.	Sinai Peninsula, Egypt	21,103
A Korean Air Boeing 777-300 had an uncontained release of high-pressure turbine	Tokyo, Japan	83,657

<b>Description</b>	<b>Location</b>	<b>Amount</b>
material and subsequent fire in the No. 1 engine during takeoff.		
A Delta Boeing 747-400 had uncontained low-pressure turbine failure.	Tokyo, Japan	11,799
The Sikorsky S76C was en route from an offshore oil platform when the pilot declared an emergency, deployed the landing gear floats, and executed a water landing.	Lagos, Nigeria	10,882
An ATR-72 returned to land at Trapani Airport after an engine shut down.	Trapani, Italy	11,807
After takeoff, a Beech 60 turned left and descended at a high rate of speed to ground impact.	Bogota, Colombia	10,063
An Airbus A330 experienced a No. 1 engine stall and subsequent turbine damage.	Riyadh, Saudi Arabia	9,820
A Swiss Global Air Lines AVRO 146-RJ100 rejected its takeoff because of sparks coming from the No. 2 engine.	Zurich, Switzerland	10,286
A fire broke out on the 4th vehicle deck of the US flagged roll-on-roll-off carrier COURAGE.	North Sea, East of Harwich, UK	9,931
A Jet Airways Boeing 737-800 had its left main landing gear collapse during rollout while landing.	Khajuraho, India	8,184
A Bell 214ST crashed 7 miles South of Camp Bastion.	Camp Bastion, Afghanistan	8,051
An Embraer ERJ170 experienced a bleed system failure during climb after takeoff.	Niigata, Japan	8,956
An Everts Air DC-9-82 cargo flight rejected its takeoff due to inadequate power and ran off the end of runway.	San Luis Potosi, Mexico	6,734
A runway incursion occurred between a Cessna 525 and an Airbus A320.	Geneva, Switzerland	5,800
An Emirates Boeing 777-300 crashed during landing.	Dubai, United Arab Emirates	149,295
A United Parcel Service airplane rejected its takeoff due to blown tire indication.	Incheon, Republic of Korea	122,769
Singapore Airlines Boeing 777 experienced an engine/wing fire after landing.	Singapore	70,133
Egypt Air A320 lost over Mediterranean.	Cairo, Egypt	63,650
Lithium battery fire occurred on a FedEx delivery truck.	Brampton, Ontario, Canada	43,528
All Nippon Airways Boeing 737-800 returned to the airport due to cabin pressure indication.	Tokyo, Japan	36,176
Cessna 208 Caravan collision with bridge.	Shanghai, China	26,113

<b>Description</b>	<b>Location</b>	<b>Amount</b>
CGC <i>Thetis</i> (US-flagged) and tug <i>Matachin</i> (Panama-flagged ) collision.	Panama Canal, Panama	19,735
Tame Airlines, Embraer 190, registration HC-COX, experienced a runway overrun during landing.	Cuenca, Ecuador	18,541
Airbus A320 engine fire occurred.	Suvarnabhumi Airport, Thailand	15,994
Cessna 172S crashed.	Seoul, Republic of Korea	13,158
SE-MDB ATR72-212A experienced propeller hub damage.	Visby, Sweden	10,392
An Airbus A320 operated by Jetstar lost left and right airspeed indication while at flight level 370. The airspeed returned as it continued flight and landed at Narita Airport, Japan.	Narita, Japan	9,447
Jet Airways Boeing 737 RH main landing gear collapse during landing roll.	Mumbai, India	9,092
CRJ700 operated by IBEX Airlines declared an emergency and returned to Fukuoka Airport, Japan, due to a dual bleed air overheat indication and cabin pressure indication.	Fukuoka, Japan	7,117
Cessna 208B experienced an engine failure during initial climb.	Georgetown, Guyana	5,944
Boeing 727-200F experienced an uncontained No. 1 engine failure shortly after takeoff.	Bogota, Colombia	5,721
Shaheen Air Intl #142, Boeing 737-400, had both main gear separate during landing.	Lahore, Pakistan	5,371
Safe Skies for Africa (SSA) Program	South Africa, Kenya, Tanzania, and Uganda	138,115
<b>Grand Total</b>		<b>\$ 1,664,764</b>

\* Report includes accidents with more than \$5,000 through September 30, 2016, and includes payroll as well as travel and other direct costs.

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## Costs of International Accident Investigations by Fiscal Year\*

<b>FY</b>	<b>Costs</b>
2012 (a)	1,641,132
2013 (b)	2,366,274
2014 (c)	976,642
2015 (d)	1,838,241
2016 (e)	1,664,764

\* Beginning with FY 2012, the agency can capture both payroll and other direct costs such as travel through its cost accounting systems. The totals above reflect these costs.

- (a) Includes \$149,707 billed to DOT under the SSA Program.
- (b) Includes \$42,727 billed to DOT under the SSA Program.
- (c) Includes \$64,897 billed to DOT under the SSA Program.
- (d) Includes \$120,026 billed to DOT under the SSA Program.
- (e) Includes \$138,115 billed to DOT under the SSA Program.

## US Transportation Fatalities, 2014 - 2015

Mode	Description	2014	2015 <sup>1</sup>
Highway:	Passenger cars	11,947	12,628
	Light trucks and vans	9,103	9,813
	Pedestrians	4,910	5,376
	Motorcycles	4,594	4,976
	Pedalcycles <sup>2</sup>	729	818
	Medium and heavy trucks	656	667
	Buses	44	49
	Other <sup>3</sup>	761	765
	Total, Highway	32,744	35,092
	Grade Crossings: <sup>4</sup>	(262)	(237)
Rail:	Freight, passenger, and commuter rails <sup>5</sup>	623	637
	(Trespassing) <sup>6</sup>	(470)	(461)
	Rail Transit <sup>7</sup>	75	79
	Total, Rail	698	716
Marine:	Recreational boating	610	626
	Cargo transport	8	37
	Commercial fishing <sup>8</sup>	20	16
	Commercial passengers	5	4
	Total, Marine	643	683
Aviation:	General aviation	424	376
	Airlines	0	0
	Air taxi	20	27
	Commuter	0	1
	Foreign/unregistered <sup>9</sup>	10	11
	Total, Aviation	454	415
Pipeline:	Gas	19	11
	Liquids	0	1
	Total, Pipeline	19	12
	<b>Total</b>	<b>34,558</b>	<b>36,918</b>

<sup>1</sup> Numbers for 2015 are preliminary estimates. Aviation data are from the NTSB; marine data are reported by the US Department of Homeland Security; all other data are reported by the US DOT.

<sup>2</sup> Pedalcycles include bicycles and other cycles.

<sup>3</sup> Other refers to vehicle nonoccupants other than pedestrians and occupant fatalities in other vehicle types, such as farm or construction equipment.

<sup>4</sup> Grade crossing fatalities are reported as a separate category but should not be added to the total because they are included in the highway and rail fatalities as appropriate.

<sup>5</sup> Freight, passenger, and commuter rail data are reported by the FRA.

<sup>6</sup> Trespassing fatalities are reported as a separate category but should not be added to the total because they are included in the freight, passenger, and commuter rail fatalities. Trespassing fatalities are not available for rail transit.

<sup>7</sup> Rail transit data are reported by the FTA and include fatalities involving heavy rail, light rail, cable car, inclined plane, monorail/automated guideway, streetcar rail, and hybrid rail.

<sup>8</sup> Commercial fishing refers to operational fatalities.

<sup>9</sup> Foreign/unregistered includes non US registered aircraft involved in accidents in the United States.

## Status of Action by State for Motor Vehicle Safety Recommendations

State	Child Passenger Safety	Primary Seat Belt Enforcement	Passenger Restriction (a)	Cell Phone (b)	Ignition Interlock	Motorcycle Helmets
Alabama	Partial	Partial	Yes	Partial	Yes	Partial
Alaska	Yes	Yes	Yes	Partial	Yes	
Arizona	Yes		Partial		Yes	
Arkansas	Partial	Partial	Yes	Partial	Yes	
California	Yes	Yes	Yes	Partial	Yes(d)	Yes
Colorado	Yes		Yes	Partial	Yes	
Connecticut	Partial	Partial	Yes	Partial	Yes	
Delaware	Yes	Yes	Yes	Partial	Yes	
District of Columbia	Yes	Yes	Yes	Partial	Yes	Partial
Florida	Partial	Partial		Partial		
Georgia	Yes	Partial	Yes	Partial		Yes
Hawaii	Yes	Yes	Partial	Partial	Yes	
Idaho	Partial		Partial	Partial		
Illinois	Yes	Yes	Yes	Partial	Yes	
Indiana	Yes	Yes	Yes	Partial		
Iowa	Partial	Partial		Partial		
Kansas	Yes	Yes	Partial	Partial	Yes	
Kentucky	Yes	Yes	Yes	Partial		
Louisiana	Partial	Yes	Partial	Partial	Yes	Yes
Maine	Yes	Yes	Yes	Partial	Yes	
Maryland	Yes	Yes	Partial	Partial	Yes	Partial
Massachusetts	Yes		Partial	Partial		Yes
Michigan	Yes	Partial	Yes	Partial		
Minnesota	Yes	Yes	Yes	Partial		
Mississippi	Partial	Partial		Partial	Yes	Partial
Missouri	Yes		Partial	Partial	Yes	Yes
Montana	Partial		Partial			
Nebraska	Partial		Partial	Partial	Yes	Yes
Nevada	Partial		Partial	Partial		Partial
New Hampshire	Partial		Yes	Partial	Yes	
New Jersey	Yes	Yes	Yes	Partial		Yes
New Mexico	Partial	Yes	Yes	Partial	Yes	
New York	Yes	Partial	Yes	Partial	Yes	Yes
North Carolina	Yes	Yes	Yes	Partial		Yes
North Dakota	Partial			Partial		
Ohio	Yes		Yes	Partial		



State	Child Passenger Safety	Primary Seat Belt Enforcement	Passenger Restriction (a)	Cell Phone (b)	Ignition Interlock	Motorcycle Helmets
Oklahoma	Yes	Partial	Yes	Partial		
Oregon	Yes	Yes	Yes	Partial	Yes	Yes
Pennsylvania	Yes		Partial	Partial		
Rhode Island	Yes	Yes	Yes	Partial	Yes	
South Carolina	Partial	Yes	Partial	Partial		
South Dakota				Partial		
Tennessee	Yes	Partial	Yes	Partial	Yes	Yes
Texas	Yes	Yes	Yes	Partial	Yes	
Utah	Yes	Yes(c)	Yes	Partial	Yes	
Vermont	Yes		Yes	Partial	Yes	Yes
Virginia	Yes		Yes	Partial	Yes	Partial
Washington	Yes	Yes	Yes	Partial	Yes	Yes
West Virginia	Yes	Partial	Yes	Partial	Yes	Partial
Wisconsin	Yes	Yes	Yes	Partial		
Wyoming	Yes		Partial	Partial		
Total	Yes = 34 + DC Partial = 16	Yes = 22 + DC Partial = 12	Yes = 31 + DC Partial = 14	Yes = 0 Partial = 49 + DC	Yes = 30	Yes = 13 Partial = 6 + DC

- (a) "Restriction" refers to drivers in the intermediate (also referred to as provisional or second) stage. Unless accompanied by a supervising driver who is at least 21 years old, these drivers are limited to no more than one passenger under age 20, family excepted, until they receive an unrestricted license or for at least 6 months.
- (b) Utah's primary seat belt law applies to all seating positions but is only effective 5/15/15 through 7/1/18.
- (c) California's all offender ignition interlock law will be effective 1/1/19.

Information as of February 9, 2017.



**National  
Transportation  
Safety Board**