U.S. DEPARTMENT OF TRANSPORTATION

OFFICE OF INSPECTOR GENERAL

DOT's Fiscal Year 2019 Top Management Challenges

OST

Report No. PT2019006

November 15, 2018

U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

Highlights

DOT's Fiscal Year 2019 Top Management Challenges

Required by the Reports Consolidation Act of 2000 and OMB Circular A-136

Office of the Secretary of Transportation | PT2019006 | November 15, 2018

What We Looked At

As required by law, we report annually on the Department of Transportation's (DOT) most significant challenges to meeting its mission. We considered several criteria in identifying DOT's top management challenges for fiscal year 2019, including their impact on safety, documented vulnerabilities, large dollar implications, and the ability of the Department to effect change.

What We Found

We identified the following top management challenge areas for fiscal year 2019:

- **Air carrier oversight.** Key focus areas: identifying and mitigating risks and balancing collaboration and enforcement.
- **Aviation safety and security.** Key focus areas: runway safety, aircraft evacuation, integration of Unmanned Aircraft Systems, cockpit security, and drug and alcohol testing.
- **Rail safety.** Key focus area: railroads' implementation of positive train control.
- **Highway safety.** Key focus areas: oversight of vehicle safety defects and management of vehicle recalls.
- **Surface infrastructure safety and investments.** Key focus areas: safety risk mitigation, use of limited infrastructure dollars, and infrastructure investment oversight.
- **National Airspace System modernization.** Key focus areas: new flight routes, new capabilities for airspace users, implementation of a new radar system, and oversight of developmental funding.
- **Cybersecurity.** Key focus areas: risk management, prevention and response to security incidents, information technology infrastructure, and aviation cybersecurity.
- **Acquisition and grant oversight.** Key focus areas: innovative acquisition practices; agency oversight of assets, contracts, and grants; and public-private partnerships.

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U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

Memorandum

Date: November 15, 2018

Subject: INFORMATION: DOT's Fiscal Year 2019 Top Management Challenges
Report No. PT2019006

From: Calvin L. Scovel III
Inspector General

To: The Secretary
Deputy Secretary

America's citizens, businesses, and communities require an efficient and safe transportation system to support travel and daily life. Each year, the Department of Transportation (DOT) invests nearly $80 billion to build, maintain, and enhance this system. The Office of Inspector General (OIG) supports the Department's mission through audits and investigations that identify ways to improve DOT's many programs. As required by law, we report annually on the Department's most significant challenges to managing its programs and meeting its goals.

Above all, the Department's top priority is safety. For example, the Federal Aviation Administration (FAA) has worked for several years to update its strategy for overseeing the safety of the aviation industry—one of the largest and most complex in the world. Nevertheless, in April 2018, the first U.S. commercial passenger fatality in 9 years raised concerns about FAA's safety oversight. FAA faces challenges identifying and mitigating operational and maintenance risks as it works with industry to implement its oversight strategy.

At the same time, FAA must address other safety issues in the National Airspace System, including reducing safety risks on airport runways, integrating Unmanned Aircraft Systems into the same airspace as piloted aircraft, and ensuring safe aircraft evacuations in emergencies. Moreover, FAA is undertaking a multibillion-dollar effort to modernize the Nation's air traffic control systems, which it considers key to enhancing safety and efficiency. To that end, FAA has made progress on implementing new capabilities, including more efficient flight routes, but continues to face significant challenges in deploying other complex technologies while enhancing infrastructure in cost-effective ways.

Meeting the Department's safety mission also requires dedicating significant focus to safety risks within our rail systems and highways. Due to several passenger rail incidents during the last 10 years, Congress required and the U.S. rail industry committed to implementing positive train control (PTC) systems. These systems use advanced train control technology to prevent collisions, overspeed derailments, and other incidents. With a statutory deadline for PTC implementation rapidly approaching in December 2018 and billions of dollars in Federal funding and loans dedicated for PTC systems, it is critical that the Department maintain focus on this complex safety challenge.

In addition, over 40,000 people lost their lives each year in motor vehicle crashes in 2016 and 2017. While most crashes involved impaired driving, speeding, or a lack of seatbelts, some were caused by vehicle defects. Over the past several years, we have made recommendations to help the National Highway Traffic Safety Administration's (NHTSA) Office of Defects Investigation (ODI) strengthen how it investigates possible vehicle defects and oversees recalls. Follow-through by NHTSA remains critical to address these highway safety risks.

While working to enhance transportation safety, the Department must also safeguard its considerable financial investments, resources, and assets. For example, DOT provides over $50 billion a year to build, repair, maintain, and oversee millions of miles of roads, bridges, tunnels, tracks, and oil and gas pipelines across the Nation. However, infrastructure needs currently outpace departmental resources. As a result, the Department faces challenges in efficiently using these resources while targeting inspections and enforcement actions to the greatest safety risks.

DOT's assets also include over 450 information technology systems, which it relies on to meet critical mission needs. The Department's cybersecurity program must protect these systems from increasingly sophisticated cyber attacks. Our work has shown that the Department remains challenged to standardize its processes, increase network visibility, and resolve longstanding weaknesses to reduce its vulnerability to cyber threats.

Finally, the Department must work diligently to fulfill its stewardship responsibilities when awarding billions in contracts and grants each year. To efficiently meet its research and procurement goals, DOT uses innovative acquisition approaches, timesaving multiple-award vehicles, and partnerships with industry and State and local governments. While innovation can deliver benefits, DOT must exercise strong oversight to achieve desired program outcomes; safeguard taxpayer dollars from fraud, waste, and abuse; and mitigate risks.

We considered several criteria to identify the Department's top management challenges for fiscal year 2019, including safety impact, documented

vulnerabilities, large dollar implications, and the Department's ability to effect change. In the enclosed report, we identify and discuss the following challenges:

- Effectively implementing FAA's new safety oversight strategy
- Protecting against a wide range of threats to aviation safety and security
- Maintaining focus on the railroad industry's implementation of positive train control
- Improving NHTSA's data use, processes, and oversight of vehicle safety defects
- Providing effective stewardship over surface infrastructure safety and investments
- Modernizing the National Airspace System while introducing new capabilities and making sound investment decisions
- Systematizing cybersecurity strategies to deter surging cyber threats
- Harnessing innovative procurement and financing practices while maintaining oversight of acquisitions, grants, and assets

As always, we will continue to work closely with DOT officials to support the Department's efforts to improve safety, enhance efficiency, and protect resources. We appreciate the Department's commitment to prompt action in response to the challenges we have identified. The final report and the Department's response will be included in DOT's Annual Financial Report, as required by law.

If you have any questions regarding this report, please contact me at (202) 366-1959. You may also contact Joseph W. Comé, Principal Assistant Inspector General for Auditing and Evaluation, at (202) 366-1427.

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cc: DOT Audit Liaison, M-1

Index of DOT Operating Administrations Discussed in Each Chapter

Mode	Chapter Reference
Federal Aviation Administration	1, 2, 6, 7, 8
Federal Highway Administration	5
Federal Motor Carrier Safety Administration	5
Federal Railroad Administration	3
Federal Transit Administration	3, 5, 8
Maritime Administration	8
National Highway Traffic Safety Administration	4
Pipeline and Hazardous Materials Safety Administration	5
Cross-modal/Departmentwide	7, 8

Chapter 1

Effectively Implementing FAA's New Safety Oversight Strategy

The Federal Aviation Administration (FAA) is charged with overseeing one of the world's largest and most complex aviation systems, which carries over 2.5 million people on approximately 45,000 flights every day. In recent years, FAA has worked to revamp its strategy for overseeing the safety of the aviation industry. For example, in 2015, FAA established requirements for all commercial passenger air carriers to implement a formal, top-down approach to managing safety risks, known as a safety management system (SMS). In addition, FAA developed and began using a new risk-based oversight system, the Safety Assurance System. However, recent events—such as the Southwest Airlines accident in April 2018, resulting in the first U.S. commercial passenger fatality in 9 years—have raised concerns about FAA's safety oversight. Proactively identifying and mitigating operational and maintenance safety risks—as well as effectively balancing industry collaboration and enforcement—remain key challenges for FAA as it works to implement its new oversight strategy and ensure the safety of the traveling public.

Key Challenges

- Implementing effective air carrier oversight by proactively identifying and mitigating significant operational and maintenance safety risks
- Balancing collaboration and enforcement in air carrier safety oversight

Implementing Effective Air Carrier Oversight by Proactively Identifying and Mitigating Significant Operational and Maintenance Safety Risks

The effectiveness of FAA's new risk-based oversight system depends on safety data that can enable the Agency to identify and target its oversight to areas of greatest risk. To supplement industry's wide array of safety reporting systems, FAA established a consolidated hotline in 2014 for stakeholders to submit safety concerns, in addition to allowing various FAA offices to receive complaints. However, we recently reported that FAA did not adequately address safety concerns or forward them to the appropriate group for investigation. Specifically, despite multiple letters and emails from the Allied Pilots Association (APA), a local FAA office did not investigate safety concerns regarding American Airlines' flight test program, which is used to verify the airworthiness of aircraft following major repairs. Further, when APA escalated its concerns in a letter to the Federal Aviation Administrator, the Administrator's office did not send the letter to the Agency's Office of Audit and Evaluation, which is responsible for investigating safety concerns. Instead, the letter was routed back to the local FAA office, where the concerns remained unresolved. In response to our recommendations, FAA committed to strengthen its processes for identifying and addressing safety concerns.

FAA's safety oversight strategy also depends on air carriers' ability to identify hazards and implement corrective actions that mitigate risk. Specifically, under SMS, air carriers must identify root causes for hazards and proactively manage risk to prevent accidents. However, recent events—including the April 2018 Southwest Airlines engine failure—have raised concerns that FAA's oversight may not ensure air carriers sufficiently meet these responsibilities. The National Transportation Safety Board is currently investigating the accident, but preliminary reports indicate similarities with a 2016 engine incident on a Southwest Airlines aircraft. It is unclear what actions the carrier took to manage the risk to prevent a future similar failure. In addition, we recently received a hotline complaint regarding a number of operational issues at Southwest Airlines, such as alleged pilot training deficiencies, raising concerns about FAA's oversight of the carrier. As such, in July 2018 we began an audit to assess FAA's oversight of Southwest Airlines' systems for managing risk.

Furthermore, FAA's safety oversight strategy relies on a strong safety culture within the Agency and industry. However, FAA's internal reports have cautioned

about changes in airline safety culture and the potential impacts on safety and airline maintenance workforces. For example, FAA recognizes the impact a single inspector can have on the safety culture and established standards that require inspectors to act impartially and avoid the appearance of preferential treatment when they perform their official duties. Nonetheless, our recent work regarding FAA's oversight of the American Airlines flight test program found that an inspector had developed a personal relationship with the head of the carrier's flight test program and appeared to give the carrier preferential treatment when safety concerns were raised. The inspector also worked with the carrier to limit future complaints. Ensuring that FAA's inspector workforce meets standards of impartiality remains a key oversight challenge for the Agency to protect its safety culture and effectively identify and mitigate risks.

Balancing Collaboration and Enforcement in Air Carrier Safety Oversight

In 2015, FAA implemented a new Compliance Philosophy as part of its safety oversight strategy. The Compliance Program, as it is now known,[1] is based on the premise that the greatest safety risk in the industry does not arise from a specific event or its outcome, but rather from an operator who is unwilling or unable to comply with rules and best practices for safety. The overarching goal of the new program is to achieve rapid compliance, eliminate a safety risk or deviation, and ensure positive and permanent changes.

FAA's Compliance Program emphasizes the Agency's preference for collaborating with air carriers through education and training over penalizing carriers as a means to address discrepancies. This program calls for FAA to work with air carriers to address the root causes of violations of safety regulations rather than imposing enforcement actions—a change in the way FAA and the airlines previously addressed compliance and safety issues. A key challenge the Agency faces is striking a balance between collaboration and enforcement and accurately assessing whether an air carrier is willing and able to correct its deficiencies.

Recently, incidents at Allegiant Airlines—and the subsequent media attention—have raised concerns about improper air carrier maintenance practices at the airline.[2] For example, congressional committees have questioned why FAA changed its oversight priorities from enforcement to compliance and whether this approach effectively addresses safety concerns. Given these concerns and challenges, we are currently reviewing FAA's oversight of air carrier maintenance programs. Specifically, we are examining FAA's independent reviews, complaints to the FAA hotline, and other sources to see whether inspectors conducting routine oversight of Allegiant and American Airlines found similar discrepancies.

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[1] On October 31, 2018, FAA renamed its Compliance Philosophy to Compliance Program.

[2] In April 2018, high-profile media reports detailed longstanding maintenance issues at Allegiant Airlines, including a series of mid-air breakdowns, aborted takeoffs, and unscheduled landings.

In addition, we are assessing whether airlines implement effective corrective actions to address the root causes of problems.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
FAA Has Not Fully Addressed Safety Concerns Regarding the American Airlines Flight Test Program (July 10, 2018)	7	5
Total	**7**	**5**

For more information on the issues identified in this chapter, please contact Matthew E. Hampton, Assistant Inspector General for Aviation Audits, at (202) 366-0500.

Chapter 2

Protecting Against a Wide Range of Threats to Aviation Safety and Security

The Federal Aviation Administration (FAA) is responsible for maintaining the safety of a diverse, complex, and rapidly evolving aviation industry. Our work and recent events have highlighted challenges for FAA in several wide-ranging areas that have garnered significant public and congressional interest. These challenges include addressing runway safety risks, ensuring safe emergency evacuations, strengthening oversight of Unmanned Aircraft Systems (UAS), improving cockpit safety and security, and enhancing oversight of aviation drug and alcohol testing.

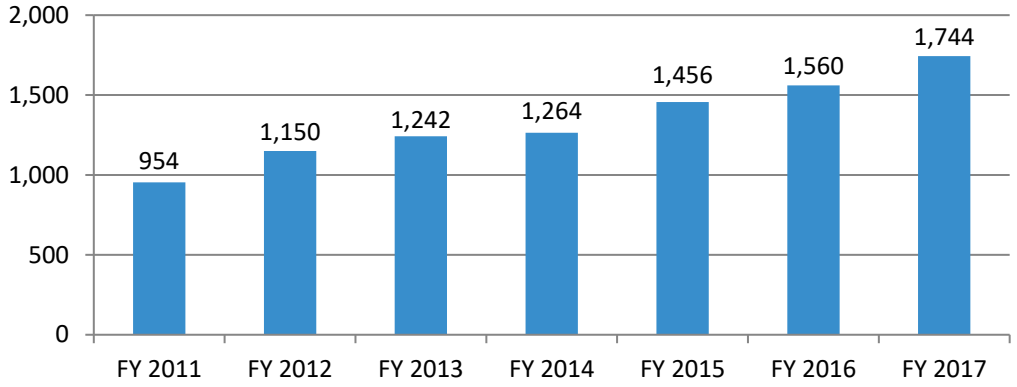
Key Challenges

- Addressing runway safety risks
- Safely evacuating airline passengers in the event of an aircraft incident
- Strengthening oversight of Unmanned Aircraft Systems in the National Airspace System
- Enhancing interagency coordination to improve cockpit security
- Ensuring effective oversight of FAA's drug and alcohol testing program

Addressing Runway Safety Risks

Recent incidents in which collisions between passenger aircraft were narrowly avoided at our Nation's major airports have called attention to concerns about runway safety. For example, in July 2017, a commercial pilot at the San Francisco International Airport attempted to land on a taxiway where four other aircraft were awaiting takeoff. Much of our work in this area has focused on FAA's efforts to reduce runway incursions—incidents involving unauthorized aircraft, vehicles, or people on a runway—a longstanding challenge for FAA. While FAA has undertaken a number of safety initiatives in this area since 2007, reports of incursions have increased, with a nearly 83-percent rise in total incursions reported between fiscal years 2011 and 2017 (see figure 1). In addition, while the number of serious runway incursions is relatively low, there have been several incidents where two aircraft have come within a few feet of colliding with each other, posing significant safety risks.

Figure 1. Total Number of Runway Incursions, Fiscal Years 2011–2017



Source: OIG analysis of FAA data

To help mitigate runway incursions, FAA initiated a Call to Action forum in 2015 with representatives from industry, labor, and Government. The forum resulted in 22 initiatives intended to mitigate runway incursions and improve safety. In June 2018, we reported that FAA had completed 10 of the 22 initiatives—including educating pilots on signs, markings, and other visual aids at high-risk airports. However, the Agency faces challenges in fully implementing the initiatives still in progress, including dedicating funding and fully implementing new technologies, which could take years to complete. In addition, FAA did not establish quantifiable goals or other metrics to measure the initiatives' effectiveness in reducing runway incursions. As a result, FAA will be limited in its ability to prioritize and adjust the initiatives based on their effectiveness. Going forward, the Agency will continue to face challenges in reducing runway safety risks. As such, we plan to further assess FAA's efforts to analyze data, identify risks, and track actions for mitigating incidents on runways.

Safely Evacuating Airline Passengers in the Event of an Aircraft Incident

Recent events have highlighted that the ability to safely evacuate an aircraft during an accident or incident can save lives. In particular, two high-profile accidents—the British Airways accident in September 2015 and the American Airlines accident in October 2016—resulted in mostly minor injuries when passengers and crew evacuated[3] and drew attention to the important role of effective evacuation standards. FAA's standards[4] for evacuating passenger aircraft require that the aircraft be fully evacuated in 90 seconds or less during a simulated evacuation drill. However, FAA has not updated these standards significantly since the 1990s, despite significant changes in the airline industry and consumer behavior. For example, the number of aircraft seats has increased, but the size of seats and distance between them—known as seat pitch—has decreased.

Following its investigation of the American Airlines accident, the National Transportation Safety Board (NTSB) identified the need for research on the effects of passengers evacuating with carry-on baggage—which can present undue risks and delays—and improved communication between flight crew and flight attendants during evacuations. NTSB's report showed that it took passengers and flight crews over 2 minutes to evacuate—significantly longer than FAA's 90-second evacuation standard for simulated tests. Due to the American Airlines accident, along with the potential for more reductions in seat pitch, aviation industry stakeholders have asked FAA to conduct more realistic evacuation testing and to address concerns such as passengers slowing evacuations by taking baggage off planes. To meet its safety goals, FAA will be challenged to identify the best ways to quickly evacuate commercial aircraft and implement evacuation standards that keep pace with a changing industry. We are currently assessing FAA's aircraft emergency evacuation standards and its process for determining whether aircraft meet them.

Strengthening Oversight of Unmanned Aircraft Systems in the National Airspace System

The growing demand for UAS commercial operations—ranging from filmmaking and precision agriculture to package delivery—represents a substantial economic opportunity for the United States but also presents one of FAA's most significant safety challenges. Since December 2015, FAA has processed more than 1.1 million UAS registrations for commercial operators and hobbyists, and reports

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[3] In September 2015, during a British Airways accident at McCarran International Airport, 157 passengers and crew evacuated the aircraft, resulting in a total of 19 minor injuries and 1 serious injury, according to the National Transportation Safety Board. In October 2016, the emergency evacuation of an American Airlines flight at Chicago O'Hare International Airport resulted in 20 minor injuries and 1 serious injury.

[4] 14 CFR § 25.803 and 14 CFR Part 25, Appendix J.

of UAS sightings by pilots and other sources have increased significantly since 2014.

To advance the safe integration of commercial UAS in domestic airspace, FAA published a rule for small UAS (i.e., systems weighing less than 55 pounds) in June 2016. However, the rule does not permit several potential UAS operations that are highly valued by industry and also considered as higher risk by FAA, such as operating a small UAS beyond line of sight or over people. To accommodate these operations, the rule allows FAA to issue waivers. We found that FAA has faced several challenges with reviewing requests for waivers, including processing applications with limited information and responding to the large volume of requests since the small UAS rule was published. For example, the Agency has a significant backlog of requests to operate UAS in the same airspace with manned aircraft. More than two-thirds of the almost 9,000 waiver requests for these types of operations were still pending review as of May 2018.

Further, FAA faces several challenges in developing a risk-based oversight system for commercial UAS operations. While the Agency has developed guidance for planning annual UAS inspections, its UAS oversight is neither data-driven nor proactive and lacks key elements of a risk-based oversight system. In addition, FAA's ability to perform meaningful risk-based surveillance is hindered by limited access to detailed data on UAS operators, FAA inspections, and risks. As a result, FAA is not well-positioned to identify and mitigate safety risks in this rapidly evolving industry and is missing opportunities to gather information that can help shape rulemaking and impact policies.

Enhancing Interagency Coordination To Improve Cockpit Security

Incidents in 2012 and 2015[5] in the United States and abroad drew attention to flight deck safety and security, including securing cockpit doors. Recognizing these challenges, FAA has improved its intelligence analysis capability, analysis of potential vulnerabilities, and process to notify manufacturers and air carriers about unsafe aircraft conditions that could be exploited by terrorists. However, our work has found that FAA may be missing collaboration opportunities that could enhance cockpit safety and security. For example, FAA did not coordinate with the Department of Homeland Security's Transportation Security Administration (TSA) at the field-office level to identify emerging flight deck security vulnerabilities. This was in part because FAA had not clarified inspectors' roles in areas where FAA and TSA regulations converge. In addition, we reported last year that FAA has identified access to the cockpit as a security vulnerability.

[5] On March 24, 2015, Germanwings Flight 9525 crashed in the Alps, killing all 150 people onboard. The crash was determined to have been caused by the deliberate and planned action of the co-pilot. In March 2012, JetBlue Airways Flight 191 was diverted after the first officer locked the captain out of the cockpit due to the captain's erratic behavior.

FAA was also missing opportunities to provide air carriers with all the information necessary to select and implement security procedures that may protect the cockpit more effectively. Enhanced communication with key industry stakeholders and TSA will be critical to FAA's efforts to ensure the safety and security of the traveling public.

Ensuring Effective Oversight of FAA's Drug and Alcohol Testing Program

Effective drug and alcohol testing programs in the transportation industry are crucial to ensuring the safety of the traveling public. NTSB recently highlighted this challenge in its *2017–2018 Most Wanted List of Transportation Safety Improvements*, stating that marijuana decriminalization, increased popularity of dangerous synthetic drugs, and a significant rise in the use and abuse of over-the-counter and prescription medication, along with alcohol, have led to an epidemic of impairment in transportation. Recent OIG investigations have reinforced the importance of maintaining strong substance abuse inspection programs. For example, in 2016, our special agents arrested a former JetBlue Airways pilot after the pilot was charged with operating an aircraft under the influence of alcohol, and in 2018, a former Alaska Airlines pilot pleaded guilty to operating a commercial aircraft under the influence of alcohol.

In light of this important safety concern, our office is conducting a series of reviews on drug-testing programs within the transportation industry—beginning with an audit of FAA's inspection program. Specifically, FAA's Drug Abatement Division oversees the aviation industry's compliance with drug and alcohol testing laws and regulations, covering pilots, mechanics, and flight dispatchers at approximately 7,000 regulated aviation companies. Given the changing landscape of drug use in the United States, developing a risk-based inspection schedule to maximize the Agency's resources will remain key to mitigating the safety risks presented by impaired pilots, mechanics, and other safety-sensitive staff.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
Opportunities Exist for FAA To Strengthen Its Review and Oversight Processes for Unmanned Aircraft System Waivers (November 7, 2018)	8	8
FAA Faces Challenges in Implementing and Measuring the Effectiveness of Its 2015 Runway Safety Call to Action Initiatives (June 27, 2018)	3	3

Title	Total Recommendations	Open Recommendations
FAA Has Taken Steps To Identify Flight Deck Vulnerabilities but Needs To Enhance Its Mitigation Efforts (June 26, 2017)	6	2
FAA Lacks a Risk-Based Oversight Process for Civil Unmanned Aircraft Systems (December 1, 2016)	6	4
Total	**23**	**17**

For more information on the issues identified in this chapter, please contact Matthew E. Hampton, Assistant Inspector General for Aviation Audits, at (202) 366-0500.

Chapter 3

Maintaining Focus on the Railroad Industry's Implementation of Positive Train Control

Over the last decade, several fatal rail accidents have led Congress to require and the U.S. rail industry to commit to implementing positive train control (PTC) systems on certain rail main lines. PTC systems use communication-based/processor-based train control technology to prevent train-to-train collisions, overspeed derailments, incursions into established work zone limits, and movement of a train through a switch in the improper positon. The importance of PTC was evident in December 2017 when an Amtrak train derailed in Dupont, WA, after entering a curve with a 30-mile per hour limit at nearly 80 miles per hour. The crash resulted in 3 fatalities and 62 injuries and, according to the National Transportation Safety Board, could have been prevented with the use of PTC. With a statutory deadline for PTC implementation rapidly approaching and billions of dollars in Federal funding and loans dedicated to PTC, it is critical that the Department maintain focus on this complex safety initiative.

Key Challenges

- Keeping railroads on track with meeting statutory deadlines
- Increasing attention to oversight of Federal funding support and identifying shortfalls

Keeping Railroads on Track With Meeting Statutory Deadlines

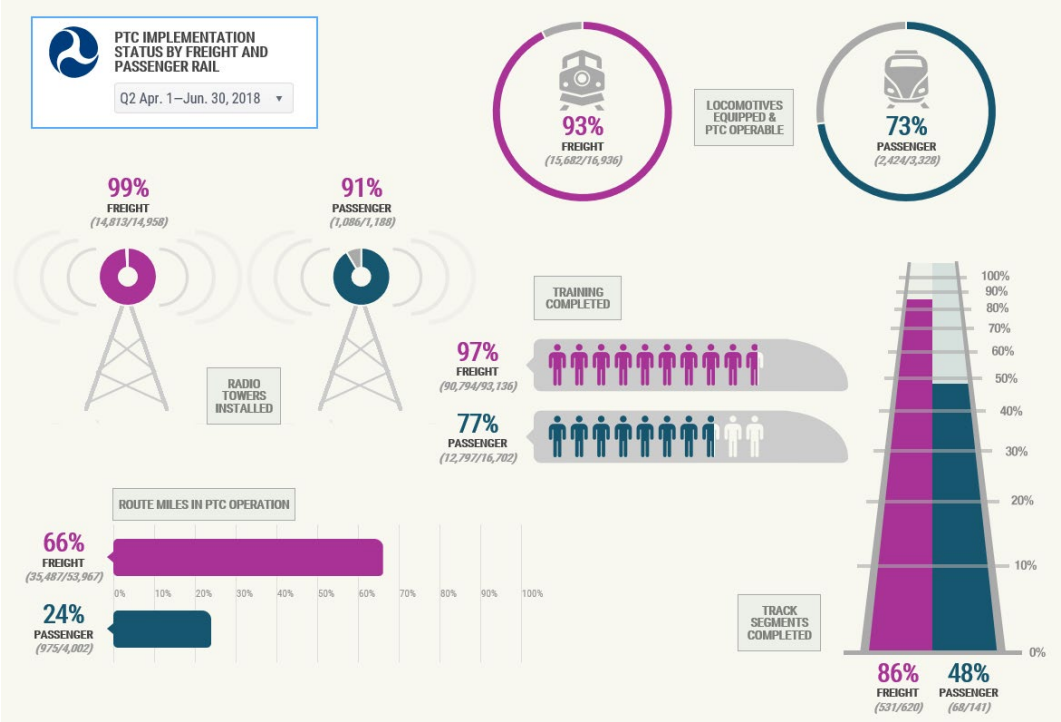
The Rail Safety Improvement Act of 2008 (RSIA)[6] required PTC systems to be implemented across a significant portion of the Nation's rail system by December 31, 2015, including Class I railroad[7] main lines handling poison or toxic-by-inhalation hazardous materials and any railroad main lines with regularly scheduled intercity or commuter rail passenger service. Citing funding and technical challenges, the industry did not meet this deadline, and Congress extended it by 3 years—to December 31, 2018—with the possibility of an additional 2-year extension if a railroad meets the statutory criteria set forth in the Positive Train Control Enforcement and Implementation Act of 2015.[8]

Since the enactment of RSIA, the Department has been tasked with overseeing PTC implementation and funding support, including grants and loans. Three separate DOT agencies—the Federal Railroad Administration (FRA), Federal Transit Administration (FTA), and the Office of the Secretary of Transportation's Build America Bureau—have provided over $2 billion for PTC implementation to 29 rail systems as of September 30, 2017. FRA is leading the oversight of implementation and has taken several actions to support railroads implementing PTC systems. For example, FRA built a PTC testbed in Pueblo, CO; established a PTC task force to track implementation status; publicly reports on a quarterly basis each railroad's progress toward full implementation of a PTC system; frequently holds meetings with individual railroads; reviews and approves railroads' various required documents (including requests to conduct PTC system testing on the general rail system and PTC Implementation, Development, and Safety Plans); hosted three symposia to discuss the statutory and regulatory requirements for PTC system implementation; and provided hundreds of hours of technical assistance. Despite these efforts, several railroads may not fully implement PTC systems on all required route miles by December 31, 2018, and will need to request FRA's approval of an alternative schedule and sequence with a deadline not later than December 31, 2020, as permitted by the statutory mandate, in order to complete testing and prove interoperability. As shown in

[6] Pub. L. No. 110-432 (2008).
[7] The Surface Transportation Board defines a Class I railroad as a railroad with an annual operating revenue greater than $447,621,226; the figure was last updated in 2017.
[8] 49 U.S.C. § 20157.

figure 2 below, as of June 30, 2018, freight railroads have made significant progress in implementing PTC systems, but passenger railroads still have over 50 percent of track segments to complete. Continuing efforts to monitor the rail industry's progress and maintaining a sense of urgency will be a critical challenge for the Department as the deadline for railroads to achieve full PTC implementation approaches.

Figure 2. PTC Implementation Status by Freight and Passenger Rail



Source: FRA

Increasing Attention to Oversight of Federal Funding Support and Identifying Shortfalls

As the railroads work to implement PTC, the Department faces the challenge of overseeing the considerable Federal investment dedicated to PTC. As of the end of fiscal year 2017, approximately 60 percent of the U.S. rail systems required to implement PTC were receiving financial support from the Federal Government. Specifically, as of September 30, 2017, 37 funding recipients had received Federal assistance for projects that vary greatly based on the type of railroad, interoperability needs, and available communication systems. As we reported in March 2018, approximately $2.3 billion in Federal funds had been obligated to implement PTC as of September 30, 2017. Of this amount, the Department obligated $1.3 billion through various Federal grants and issued approximately $1 billion through a 2015 loan. At that time, more than half of the recipients reported spending over 50 percent of their funds, and about 40 percent reported

spending over 75 percent. We also noted that although the deadline for PTC implementation is at the end of 2018, only 4 of 37 funding recipients had completely expended their Federal funds. Some funding recipients also expressed concerns about potential shortfalls in funding to operate and maintain PTC, which could result in funds being shifted from other safety priorities.

Since we issued our report, Congress has made additional funds available to railroads for PTC implementation. For example, on August 24, 2018, the Department announced that it awarded another $203.7 million in grants from the Fiscal Year 2018 Consolidated Rail Infrastructure and Safety Improvements program to assist 28 PTC deployment projects in 15 States. However, as we have reported, DOT's financial oversight methods, including FRA's and FTA's own tracking programs and tools, vary depending on the type of funding program issuing the grants. As such, the Department may need to consult with the rail systems to provide accurate and detailed information on PTC-specific funding. Going forward, the Department will remain challenged to maintain oversight of the diverse financial support provided to rail systems, while monitoring the funding implications for any shortfalls that could crowd out other safety-critical projects.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
Federal Funding Support for Positive Train Control Implementation (March 28, 2018)	0	0
Observations on Federal Funding Support for Positive Train Control Implementation (March 1, 2018)	n/a	n/a
Total	**n/a**	**n/a**

For more information on the issues identified in this chapter, please contact Barry DeWeese, Assistant Inspector General for Surface Transportation Audits, at (202) 366-5630.

Chapter 4

Improving NHTSA's Data Use, Processes, and Oversight of Vehicle Safety Defects

According to the National Safety Council, over 40,000 people lost their lives each year in motor vehicle crashes in 2016 and 2017. Another 4.57 million people sustained serious injuries in 2017 alone. While most fatalities caused by motor vehicle crashes involve impaired driving, speeding, or a lack of seatbelts, some involve a vehicle defect. For example, 15 fatalities and 220 injuries have been linked to the high-profile defect that caused Takata airbags to deploy improperly during crashes and severely injure vehicle occupants with metal shrapnel. The National Highway Traffic Safety Administration's (NHTSA) Office of Defects Investigation (ODI) is responsible for investigating possible safety defects and overseeing safety recall campaigns to assess recall effectiveness. Since 2011, we have reported on a number of opportunities for ODI to strengthen its defect investigations and recall management.

Key Challenges

- Strengthening processes for identifying, investigating, and mitigating safety defects
- Enhancing controls for effectively managing vehicle recalls

Strengthening Processes for Identifying, Investigating, and Mitigating Safety Defects

Our body of work assessing NHTSA's ODI over the past 7 years has underscored the Agency's need to identify and address dangerous safety issues. These include high-profile defects, such as Toyota's stuck throttles, General Motors' ignition switch failures, and Takata's exploding airbags. For example, ODI did not always adequately document why a possible vehicle safety defect was or was not investigated. We also identified weaknesses in the ODI workforce, including the need for a workforce assessment, training, and proper supervision. In addition, since 2014, we have made numerous recommendations to help ODI improve how the Agency collects and analyzes safety data to remove unsafe vehicles from roads. For example, in 2015, we recommended assessing and improving the quality of early warning data, expanding early warning data verification processes, and enhancing supervisory reviews of early warning data analyses. Moreover, the vehicle safety issues at Toyota, General Motors, and Takata prompted significant public safety criminal investigations by our Office of Investigations and others. These investigations resulted in a combined $3.1 billion in financial recoveries.

In response to our audit recommendations, NHTSA has improved its processes for determining which safety issues warrant investigation and enhanced ODI's quality control mechanisms for complying with Agency policies. However, NHTSA faces challenges in following through on its actions to address our recommendations and improve its ability to identify and take action on safety defects. For example, the Agency has not yet developed sufficient quality control mechanisms to ensure it can fully implement our recommendations regarding data use. It is critical that NHTSA continue to strengthen its collection and analysis of early warning data and vehicle defects, enhance defect investigations using risk-based processes, and increase enforcement to mitigate the impact of serious safety defects on drivers.

Enhancing Controls for Effectively Managing Vehicle Recalls

NHTSA's ODI is also responsible for overseeing safety recalls conducted by vehicle and equipment manufacturers. For example, since November 2008, NHTSA has been overseeing recalls of Takata airbags.[9] NHTSA estimates that 37 million vehicles are currently involved in the Takata recalls, and that number could grow to 70 million vehicles by the end of 2019.

[9] In January 2017, following an investigation by our office and other partners, Takata pleaded guilty to fraud based on repeated, systematic falsification of the test data it provided to vehicle manufacturers that purchased its airbags.

However, earlier this year we reported that ODI lacks adequate processes and oversight for passenger vehicle recalls, such as using its authority to verify recall information. We found multiple examples of recalls, including those involving Takata airbags, that had not received sufficient scrutiny and were missing information. For example, manufacturers must submit to NHTSA information on defect remedies, owner notification letters, and dealer repair instructions, but many recalls lacked this information. In addition, ODI has not fully demonstrated a risk-based approach to decision-making or to prioritizing its oversight of scope, remedies, and implementation of vehicle recalls. As a result, ODI cannot be reasonably sure that vehicle recalls are adequate or that critical safety information is collected and clearly communicated to the public.

ODI agreed to create a process with management controls to monitor whether high-risk recalls quickly and completely address underlying safety concerns. Going forward, NHTSA will be challenged to incorporate lessons learned from the Takata recalls and follow through on its planned actions to improve monitoring efforts.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
NHTSA's Management of Light Passenger Vehicle Recalls Lacks Adequate Processes and Oversight (July 18, 2018)	6	6
Additional Efforts Are Needed To Ensure NHTSA's Full Implementation of OIG's 2011 Recommendations (February 24, 2016)	2	0
NHTSA's Efforts To Identify Safety-Related Vehicle Defects (June 23, 2015)	n/a	n/a
Inadequate Data and Analysis Undermine NHTSA's Efforts To Identify and Investigate Vehicle Safety Concerns (June 18, 2015)	17	0

Title	Total Recommendations	Open Recommendations
Process Improvements Are Needed for Identifying and Addressing Vehicle Safety Defects (October 6, 2011)	10	0
Total	**35**	**6**

For more information on the issues identified in this chapter, please contact Barry DeWeese, Assistant Inspector General for Surface Transportation Audits, at (202) 366-5630.

Chapter 5

Providing Effective Stewardship Over Surface Infrastructure Safety and Investments

The Department provides more than $50 billion each year to build, maintain, and oversee our Nation's surface infrastructure, including millions of miles of roads, bridges, tunnels, tracks, and oil and gas pipelines. However, infrastructure needs have outpaced the Department's financial resources. To effectively address these needs while ensuring safety, the Department must make sure that its oversight and enforcement actions target areas of greatest risk. At the same time, DOT will be challenged to maximize all available funding sources, improve its process for delivering projects, and enhance its oversight of infrastructure investments.

Key Challenges

- Mitigating safety risks in surface transportation
- Improving the efficient and effective use of limited infrastructure dollars
- Ensuring effective oversight of surface infrastructure investments

Mitigating Safety Risks in Surface Transportation

Transportation safety is the primary goal of the Secretary and the Department. In working to meet this goal, the Department faces the overall challenge of targeting its oversight and enforcement resources to ensure its State, local, and private industry counterparts comply with safety-related laws and requirements.

For example, the Pipeline and Hazardous Materials Safety Administration (PHMSA)[10] lacks a comprehensive, current workforce management plan to ensure it has aligned its staff to effectively meet its mission and identify its future resource needs. For instance, the Agency is taking on an expanded role in reviewing permits for liquefied natural gas (LNG) export terminals, 14 of which are awaiting Federal review. When those facilities become operational, PHMSA will inspect the operators' compliance with DOT's LNG safety regulations. In addition, in 2016 Congress mandated that PHMSA establish safety regulations for small-scale LNG facilities.[11] Over time, demand for PHMSA oversight for LNG facilities may increase, as U.S. LNG exports are projected to rise from about 3 billion cubic feet per day in 2018 to 15 billion cubic feet per day in 2030.[12]

Bridge and tunnel safety present a challenge for the Federal Highway Administration (FHWA). According to the Agency, about 8 percent of the Nation's more than 615,000 bridges are in poor condition.[13] In 2009, we recommended that FHWA improve its bridge inspection and inventory standards—actions later mandated in the Moving Ahead for Progress in the 21st Century Act[14] (MAP-21)—but the Agency's rulemaking process to make these improvements is more than 4 years behind its schedule. We also made recommendations for FHWA to improve its oversight of bridge safety, and since then the Agency has taken steps to implement a data-driven, risk-based approach to oversee State bridge inspection programs. However, the Agency has not fully implemented a recommendation we made in 2015 to develop a comprehensive national bridge safety risk-management process. To its credit, FHWA has made progress toward MAP-21 requirements to establish a data-driven national tunnel inspection program. Going forward, it will be critical for FHWA to pursue a rigorous and

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[10] According to PHMSA, its 213 Federal inspection and enforcement staff—and 382 State inspectors—are responsible for regulating nearly 3,000 companies that operate 2.8 million miles of pipelines, 152 LNG plants, 403 underground gas storage fields, and over 8,100 hazardous liquid breakout tanks.

[11] Small-scale LNG facilities can produce as little as 200 cubic feet per day. In comparison, Cheniere's Sabine Pass LNG export facility in Cameron Parish, LA, has a production capacity of 2.7 billion cubic feet per day.

[12] According to the U.S. Energy Information Administration.

[13] Bridges in poor condition include those that have experienced significant deterioration. With the implementation of National Performance Management Measures, FHWA revised its nomenclature and criteria for bridges classified as structurally deficient to be equivalent to those classified to be in poor condition.

[14] Pub. L. No. 112–141 (2012).

timely oversight process to ensure the safety of the Nation's almost 500 highway tunnels.

The Federal Transit Administration (FTA) also faces oversight challenges as it continues transitioning to its enhanced safety role. By April 15, 2019, 30 States with rail transit systems must establish an FTA-certified State Safety Oversight (SSO) program, as required by MAP-21. The purpose of the SSO program is to oversee safety at rail transit systems. Going forward, FTA will evaluate all SSO programs annually. In addition to certifying and evaluating SSO programs, FTA provides Federal funds through the SSO Formula Grant Program for eligible States to develop or carry out their SSO programs. FTA has made significant progress in certifying 25 programs, but several remain at risk of missing the deadline, jeopardizing funding for transit operators throughout those States. If a State fails to meet the certification deadline, FTA cannot award any new grants to transit operators within that State until its SSO program is certified. Such a lack of funding could affect transit safety and availability.

Ensuring the safety of our Nation's roads also requires addressing the increase in fatalities involving large trucks and buses. According to data from the Federal Motor Carrier Safety Administration (FMCSA), fatalities in crashes involving large trucks or buses grew from 4,397 in 2012 to 4,844 in 2017, a 10.2-percent increase. Last year, the National Academy of Sciences made six recommendations to improve FMCSA's Compliance, Safety, Accountability program. This program seeks to identify and remove high-risk motor carriers from roads through steps such as targeted roadside inspections of trucks and onsite compliance reviews of carriers. In response, FMCSA developed a congressionally mandated corrective action plan. The Agency may continue to face complex challenges as it works to implement its corrective action plan and improve its information systems and associated safety performance data throughout the motor carrier industry.

Improving the Efficient and Effective Use of Limited Infrastructure Dollars

Another goal of the Secretary and the Department is to use transportation infrastructure dollars to more efficiently and effectively meet growing demands on the Nation's system. A key challenge DOT faces is ensuring that available Federal aid is applied towards those projects that have the greatest potential to reduce traffic congestion, enhance economic viability and safety, and improve project delivery. For example, DOT's Better Utilizing Investments to Leverage Development (BUILD) discretionary grant program recently made $1.5 billion available to support surface transportation infrastructure projects with a regional or local impact. The Department prioritizes rural communities within this program. DOT's challenge is to ensure that it awards BUILD's three-fold annual increase in funding in a timely, fair, and competitive process to maximize benefits for the recipients. Our prior work found that DOT encountered problems with aspects of this process with BUILD's predecessor, the Transportation Investment

Generating Economic Recovery (TIGER) program. Issues included the lack of effective guidance on cost-benefit analysis reviews and insufficient documentation for key decisions made during the application review and awarding processes. DOT has completed steps to correct these issues, and the audit recommendations related to them have been closed.

DOT's goals also include improving the timeliness of transportation projects. The Department has taken steps in recent years towards this goal for key infrastructure projects in response to congressional mandates in MAP-21 Subtitle C[15] and the Fixing America's Surface Transportation Act of 2015 (FAST Act).[16] For example, FHWA has taken actions to close four of the five recommendations we made in 2017 to address vulnerabilities in its plans to meet Subtitle C that could impede DOT's initiative to accelerate project delivery and reduce project costs.

A key component of project acceleration will be to address the FAST Act's provisions for streamlining the environmental review process for transportation projects. For example, the act requires DOT to undertake several actions to align Federal environmental reviews and improve its implementation of the National Environmental Policy Act (NEPA).[17] Additionally, an Executive Order signed by the President in 2017 established a goal of completing all environmental reviews of major infrastructure projects within 2 years.[18] Given that the median time to complete an environmental impact statement[19] for transportation projects is more than 4 years, it will be a challenge for DOT to ensure more timely reviews and authorization decisions. To meet these goals, DOT will need to effectively implement an April 2018 memorandum of understanding it signed with other Federal agencies and update its NEPA implementing procedures.

Ensuring Effective Oversight of Surface Infrastructure Investments

Strong internal controls are essential to provide effective stewardship over the Department's billions of dollars in surface transportation investments. For example, in a 2016 audit report we highlighted the need for FHWA to improve oversight of funds spent on preliminary engineering (PE)—i.e., Federal funds spent by States on design and related ground work before a highway or bridge

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[15] Pub. L. No. 112–141 (2012).
[16] Pub. L. No. 114–94 (2015).
[17] Pub. L. No. 91-190 (January 1, 1970), and as amended—establishes the framework for Federal environmental reviews and requires Federal agencies to evaluate the potential environmental effects of proposed actions on the human environment.
[18] Executive Order 13807, *Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects*, August 15, 2017.
[19] NEPA requires Federal agencies to prepare an environmental impact statement for projects with major actions that significantly affect the quality of the human environment.

project advances to construction or acquires right-of-way.[20] We reported that FHWA was not consistently enforcing a law[21] requiring States to repay Federal expenditures for PE if the project in question does not acquire right-of-way or begin construction in the 10 years following the obligation of Federal funds. As a result, we projected that $3.3 billion of Federal funds authorized during fiscal years 2000 through 2004 were at risk of not being repaid to the Highway Trust Fund or were used inefficiently due to FHWA's inaction. All seven recommendations we made to FHWA to improve its oversight of PE funds remain open.[22]

Effective oversight is also critical for the funds that FTA provides to grantees across its 10 regions each year—over $11.5 billion in fiscal year 2017 alone. Our work has identified longstanding challenges in FTA's oversight of its grantees. For example, we reviewed four major projects in FTA's three western regions and found that insufficient FTA reviews of financial reports allowed one grantee's use of incorrect indirect rates to go undetected for several years. As a result, the grantee reimbursed $11.9 million in Federal funds. FTA has completed actions to close all five of our recommendations to strengthen its project oversight and processes, but strong oversight will remain key to mitigate financial risks.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
DOT Has Completed FAST Act Requirements on Aligning Federal Environmental Reviews (November 6, 2018)	0	0
Initial Audit of Florida International University Pedestrian Bridge Project – Assessment of DOT's TIGER Grant Review and Selection Processes (October 29, 2018)	0	0
PHMSA Has an Opportunity To Refine Its Guidance and Performance Reporting for the Pipeline Safety Research and Development Program (May 30, 2018)	3	3

[20] Right-of-way is new real property that must be acquired in order to construct or complete a transportation project.
[21] According to 23 U.S. Code (U.S.C.) § 102(b).
[22] FHWA has requested closure of two of the seven recommendations; however, these recommendations remain open pending an ongoing OIG review of the Agency's proposed actions.

Title	Total Recommendations	Open Recommendations
Improvements Are Needed To Strengthen the Benefit-Cost Analysis Process for the TIGER Discretionary Grant Program (February 28, 2018)	4	0
PHMSA Has Improved Its Workforce Management but Planning, Hiring, and Retention Challenges Remain Oversight (November 21, 2017)	3	3
PHMSA Is Establishing Controls for Technical Assistance Grants but Needs To Improve Its Award and Oversight Processes (July 19, 2017)	3	0
Review of Major Western Capital Projects Points to Overall Improvements Needed in FTA's Financial Guidance and Oversight (May 9, 2017)	5	0
Vulnerabilities Exist in Implementing Initiatives Under MAP-21 Subtitle C to Accelerate Project Delivery (March 6, 2017)	5	1
Improvements in FTA's Safety Oversight Policies and Procedures Could Strengthen Program Implementation and Address Persistent Challenges (November 2, 2016)	7	0
Insufficient Guidance, Oversight, and Coordination Hinder PHMSA's Full Implementation of Mandates and Recommendations (October 14, 2016)	5	3
FHWA Does Not Effectively Ensure States Account for Preliminary Engineering Costs and Reimburse Funds as Required (August 25, 2016)	7	7
Oversight of Major Transportation Projects: Opportunities To Apply Lessons Learned (June 8, 2015)	n/a	n/a
FHWA Effectively Oversees Bridge Safety, but Opportunities Exist To Enhance Guidance and Address National Risks (February 18, 2015)	5	4
FHWA Has Not Fully Implemented All MAP-21 Bridge Provisions and Prior OIG Recommendations (August 21, 2014)	5	0
PHMSA's State Pipeline Safety Program Lacks Effective Management and Oversight (May 7, 2014)	7	0
Total	**59**	**21**

For more information on the issues identified in this chapter, please contact Barry DeWeese, Assistant Inspector General for Surface Transportation Audits, at (202) 366-5630.

Chapter 6

Modernizing the National Airspace System While Introducing New Capabilities and Making Sound Investment Decisions

Through its multibillion-dollar Next Generation Air Transportation System (NextGen) program, the Federal Aviation Administration (FAA) is modernizing the Nation's air traffic control system with the goal of providing safer, more efficient air traffic management by 2025. FAA has made progress in working with industry to implement high-priority capabilities that will deliver tangible benefits to users within the National Airspace System (NAS), including new more efficient flight routes. However, the Agency continues to face challenges with deploying new and complex capabilities while enhancing infrastructure in a cost-effective manner.

Key Challenges

- Addressing barriers to implementation of new flight routes
- Providing new capabilities to airspace users while modernizing systems
- Replacing existing radar with a new system financed by the auction of electromagnetic spectrum
- Strengthening management oversight of developmental funding for air traffic management

Addressing Barriers to Implementation of New Flight Routes

A cornerstone of NextGen is advancing Performance-Based Navigation (PBN), a top investment priority for both FAA and industry. New PBN flight procedures can provide significant benefits to airspace users, such as more direct flight paths, enhanced airspace capacity, improved on-time airport arrival rates, and reduced aircraft emissions and fuel burn. As part of its PBN implementation efforts, FAA established the Metroplex program in 2010 to increase efficiency in congested, metropolitan areas with multiple airports.

FAA and industry have since prioritized 12 locations where flight procedure improvements are expected to yield near-term benefits. FAA has implemented PBN procedures at 7 of these 12 locations. However, our past work has identified challenges to implementing PBN and achieving the full range of expected benefits. These challenges include community concerns about aircraft noise, a lack of automated decision support tools for controllers, and the need to streamline the development of new flight procedures to accelerate benefits. FAA now expects to complete the remaining sites in 2021—4 years later than originally planned. We are currently assessing FAA's progress in its implementation of Metroplex, identification of program benefits achieved, and resolution of barriers to PBN. We are also assessing the soundness of FAA's methods to develop benefit estimates.

Providing New Capabilities to Airspace Users While Modernizing Systems

As it works to deliver new NAS capabilities, such as PBN routes, FAA must also maintain and upgrade important air traffic control systems such as the multibillion-dollar En Route Automation Modernization (ERAM) system. Air traffic controllers rely on ERAM to manage high-altitude air traffic at 20 facilities nationwide.

FAA has begun a series of overlapping ERAM component sustainment (or "tech refresh") and enhancement efforts that will replace the system's hardware and

introduce improvements for the controller workforce through 2025.[23] The current cost of ERAM, including the ongoing technical refresh and system enhancement efforts, is more than $3.2 billion. This excludes upgrades that FAA plans to undertake beyond 2023, which do not yet have approved costs and schedules.

At the same time, FAA is beginning to integrate Data Communications (DataComm)[24]—one of the highest-priority NextGen investments for FAA and industry. Working with the airlines, FAA plans to implement DataComm for controllers and pilots at high-altitude facilities beginning in 2019 through 2021 at a cost of over $691 million. Deploying DataComm at the 20 facilities with ERAM while replacing system hardware (and implementing other enhancements) represents a significant system integration challenge.

Replacing Existing Radar With a New System Financed by the Auction of Electromagnetic Spectrum

FAA manages air traffic and collects weather information with an aging radar infrastructure that has been in service longer than originally planned, making it increasingly difficult and expensive to maintain. FAA has partnered with three other agencies[25] in the Spectrum Efficient National Surveillance Radar (SENSR)[26] program to auction Government-owned electromagnetic spectrum frequencies and use the revenue to develop and deploy new radar systems.

Given the significant investment, coordination, and development efforts required to procure, test, and implement a new national air and weather surveillance system, the House Appropriations Committee requested that we examine FAA's efforts to carry out the program. Preliminary results from our ongoing work show that the Agency faces a number of high risks and challenges in advancing SENSR, including an aggressive schedule and uncertainties regarding how much revenue the auction will generate. The new radar systems are currently estimated to cost $12 billion. As our work continues, we will focus on recommending ways to promote the coordination, planning, and risk mitigation FAA needs to move forward with this ambitious and wide-reaching effort.

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[23] Although ERAM was not fully implemented nationwide until March 2015, some of the original hardware was installed as early as 2004.

[24] DataComm is expected to provide two-way digital communications between controllers and flight crews by reducing radio voice communications, improving accuracy, safety, and reducing time.

[25] FAA's three partner agencies are the National Oceanic and Atmospheric Administration (NOAA), Department of Defense, and Department of Homeland Security.

[26] The SENSR program is a cross-agency program formed by FAA and three other partner agencies to assess the feasibility of vacating and auctioning a band of Government-owned radio frequency valued in the billions of dollars. Proceeds from the auction will be used to finance the deployment of a new system to meet the needs of all four agencies, providing surveillance for air traffic, weather, law enforcement, and national defense. However, in August 2018, NOAA removed a key weather requirement and largely withdrew from the program due to the associated risks. NOAA plans to remain in an advisory role.

Strengthening Management Oversight of Developmental Funding for Air Traffic Management

FAA annually spends millions of dollars on research and air traffic development projects through its capital account and faces challenges in managing these efforts while providing adequate oversight. These projects are part of a development, testing, and demonstration process that FAA uses to limit risks in new air traffic management concepts. FAA manages each one with project-level agreements (PLA)—an internal control mechanism for documenting agreed-upon work and managing project execution.

As we reported in March 2018, FAA lacked effective management controls and a clearly established framework for managing the oversight of developmental projects and addressing persistent problems. For example, in a review of 22 PLAs from the $1.7 billion spent during fiscal years 2009 to 2015, we found that 12 did not align with FAA's high-priority NextGen investment decisions, primarily because they were for support or implementation work. Furthermore, FAA had not defined which types of projects were eligible for developmental funding, and lacked standard operating procedures until 2016, 8 years after it began to use PLAs. We also found that FAA's Office of NextGen had not effectively executed and measured the outcomes of NextGen developmental projects, including tracking expenditures by PLA and obtaining deliverables for the projects.

FAA is currently working to address our recommendations to improve its management and oversight of NextGen developmental funding. Better management of these funds is especially important given that FAA expects to receive about $322.7 million this fiscal year and has estimated a need for an additional $1.4 billion for the next 4 years for developmental projects. Addressing our concerns will help FAA meet the continuing challenge of achieving better outcomes for its air traffic management development efforts.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

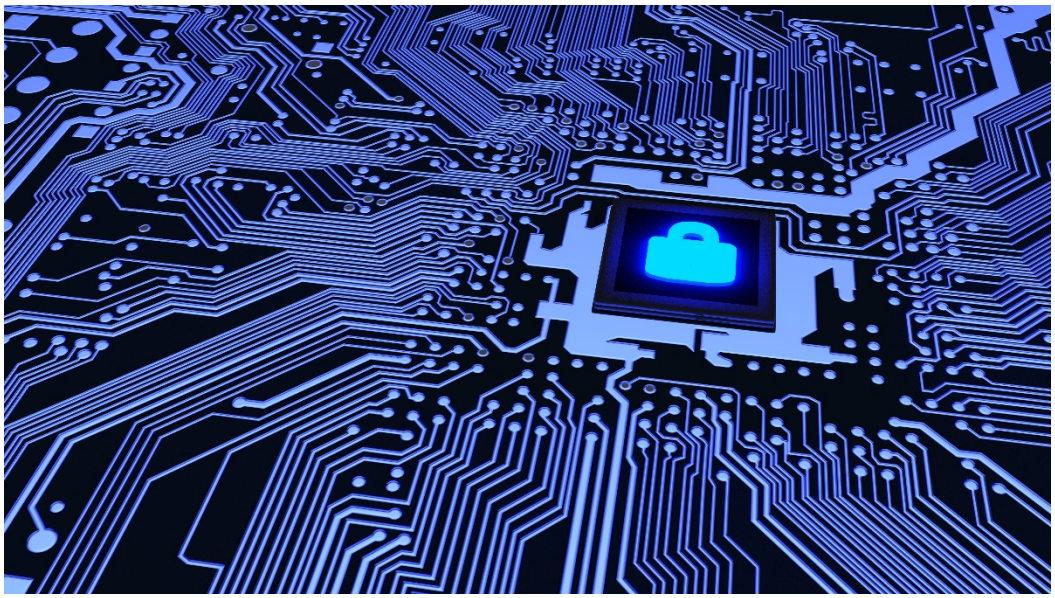
Title	Total Recommendations	Open Recommendations
FAA Has Taken Steps To Address ERAM Outages, but Some Vulnerabilities Remain (November 7, 2018)	3	3
FAA Needs To Strengthen Its Management Controls Over the Use and Oversight of NextGen Developmental Funding (March 6, 2018)	6	4

Title	Total Recommendations	Open Recommendations
FAA Has Made Progress Implementing NextGen Priorities, but Additional Actions Are Needed To Improve Risk Management (October 18, 2017)	0	0
FAA Has Not Effectively Deployed Controller Automation Tools That Optimize Benefits of Performance-Based Navigation (August 20, 2015)	4	0
FAA Faces Significant Obstacles in Advancing the Implementation and Use of Performance-Based Navigation Procedures (June 17, 2014)	3	1
Total	**16**	**8**

For more information on the issues identified in this chapter, please contact Matthew E. Hampton, Assistant Inspector General for Aviation Audits, at (202) 366-0500.

Chapter 7

Systematizing Cybersecurity Strategies To Deter Surging Cyber Threats



To accomplish its mission, DOT relies on over 450 information technology systems. The Department's cybersecurity program is critical to protect these systems from malicious attacks or other compromises that may inhibit DOT's ability to carry out its missions. As cyber threats continually evolve and expand, the Department faces significant challenges in strengthening its systems while adapting to new and rising threats. To address cybersecurity concerns, the Department needs to standardize its processes, increase network visibility, resolve longstanding weaknesses, and implement congressionally mandated aviation cybersecurity initiatives.

Key Challenges

- Standardizing cybersecurity processes to manage enterprise-wide cybersecurity risks
- Increasing network visibility to proactively prevent and respond to security incidents
- Resolving longstanding security weaknesses to strengthen information technology infrastructure
- Implementing congressionally mandated aviation cybersecurity initiatives

Standardizing Cybersecurity Processes To Manage Enterprise-Wide Cybersecurity Risks

The Federal Information Security Modernization Act (FISMA) of 2014[27] requires Federal agencies to implement procedures that cost-effectively reduce risk to a reasonable level. However, our annual FISMA evaluations consistently find the Department faces challenges in implementing processes to protect information and information systems.

For example, during our 2017 FISMA review, 71 DOT systems at 8 Operating Administrations were not authorized to operate by a senior official as required. In addition, DOT lacked an effective process for Operating Administrations to assess, authorize, and monitor common security controls—controls that support multiple information systems. This inconsistent implementation of processes throughout the Department exposes it to increased and undetected cybersecurity risks.

Increasing Network Visibility To Proactively Prevent and Respond to Security Incidents

DOT policy[28] requires that DOT's Office of Chief Information Officer (OCIO) have full network visibility over all departmental systems, including those that contractors and other Government organizations operate on behalf of DOT's Operating Administrations. However, during a 2016 audit of DOT's cybersecurity incident handling, we found that the Department's Security Operations Center (SOC) did not have access to all departmental systems to monitor them for security incidents. In addition, the Department had not established a ranking scheme to address incidents based on the seriousness of the risk they pose. Our recommendations to address these deficiencies remain open, challenging DOT's ability to effectively combat cyber threats.

Resolving Longstanding Security Weaknesses To Strengthen Information Technology Infrastructure

FISMA requires Federal agencies to develop processes to remediate security weaknesses. However, the Department has faced longstanding challenges in tracking and effectively resolving identified weaknesses. As stated in our 2017 FISMA report, DOT had 4,529 open security weaknesses documented in its Cybersecurity Assessment and Management (CSAM) system. This is approximately the same amount of unaddressed weaknesses that we reported a decade ago (4,286).

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[27] Pub. L. No. 113-283 (2014).

[28] Departmental Cybersecurity Compendium, Supplement to DOT Order 1351.37 Departmental Cybersecurity Policy dated March 2018, Version 4.2.

Over the last 10 years, we have consistently found that the CSAM database does not include all known security weaknesses. For example, FAA did not track in CSAM the weaknesses that the Government Accountability Office (GAO) identified in its 2015 report on the air traffic control information security program, which resulted in 185 recommendations.[29] Furthermore, OCIO did not report security weakness to CSAM for open recommendations from our previous FISMA reports. Incomplete information on security weaknesses in CSAM challenges the Department's ability to assess risk and funding requirements and resolve its longstanding security weaknesses.

Implementing Congressionally Mandated Aviation Cybersecurity Initiatives

The Department faces some of its most significant cybersecurity challenges at FAA, which owns over 300—or about 70 percent—of DOT's information technology investments. Specifically, FAA operates a vast network of systems and facilities for managing air traffic in the National Airspace System (NAS). This complex network has evolved over the years into an amalgam of diverse legacy radars and newer satellite-based systems for tracking aircraft, as well as a new initiative for controllers and pilots to share information through data link communications.

In 2016, the FAA Extension, Safety, and Security Act[30] directed FAA to establish a new "total systems" approach to enhance its ongoing cybersecurity efforts for securing the NAS. Preliminary results from our ongoing work[31] show that FAA has taken initial steps in addressing the act's requirements, such as completing a strategic plan with cybersecurity goals and objectives, developing a risk model to assess FAA operations, and establishing a research and development (R&D) plan to outline further cyber initiatives. However, FAA will be challenged to continue to implement the risk model across all of its lines of business and operations, establish priorities for its cyber R&D efforts, and coordinate ongoing efforts with other agencies (such as the Departments of Defense and Homeland Security) to prevent duplicative efforts and maximize the Federal investment in cybersecurity research.

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[29] GAO, *FAA Needs to Address Weaknesses in Air Traffic Control Systems* (GAO-15-221), January 2015. In the Highlights for this report, GAO notes that it also recommended additional actions to addresses security control weaknesses in a separate report with limited distribution.

[30] Pub. L. No. 114-190 (2016).

[31] At the request of the Chairmen and Ranking Members of the House Committee on Transportation and Infrastructure and the Subcommittee on Aviation, we are assessing FAA's progress in addressing the act's cybersecurity requirements.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
FISMA 2017: DOT's Information Security Posture Is Still Not Effective (January 24, 2018)	8	8
DOT Cybersecurity Incident Handling and Reporting Is Ineffective and Incomplete (October 13, 2016)	4	4
Total	**12**	**12**

For more information on the issues identified in this chapter, please contact Louis C. King, Assistant Inspector General for Financial and Information Technology Audits at (202) 366-1407, and Matthew E. Hampton, Assistant Inspector General for Aviation Audits, at (202) 366-0500.

Chapter 8

Harnessing Innovative Procurement and Financing Practices While Maintaining Oversight of Acquisitions, Grants, and Assets

DOT annually obligates more than $70 billion for contracts and grants. To award contracts and grants in a timely manner and achieve effective outcomes for its projects, the Department increasingly relies on innovative acquisition approaches; time-saving multiple-award vehicles; and partnerships with industry, State and local governments, and other stakeholders. While innovation in acquisitions and grant awards can deliver important benefits, strong oversight remains essential to achieve desired program outcomes; safeguard Federal assets and investments from fraud, waste, and abuse; and mitigate risks to the Department's mission.

Key Challenges

- Implementing innovative and streamlined acquisition practices while managing risk
- Strengthening agency oversight of DOT assets, contracts, and grants
- Defining new roles and responsibilities as use of public-private partnerships increases

Implementing Innovative and Streamlined Acquisition Practices While Managing Risk

DOT relies on innovative agreements as well as streamlined multiple-award vehicles to strategically acquire a wide range of supplies and services to meet mission needs. For example, the Federal Aviation Administration (FAA) uses multiple-award vehicles[32] to support major initiatives such as the Next Generation Air Transportation System (NextGen) and meet DOT procurement targets for small and disadvantaged businesses. While multiple-award vehicles can streamline the process for meeting acquisition goals, our work has identified oversight vulnerabilities that increase risk. For instance, the Electronic FAA Accelerated and Simplified Tasks (eFAST) web-based contracting vehicle is FAA's preferred method for making small business awards. However, we reported last year that FAA did not consistently apply its own procurement policies during the eFAST award process. For example, FAA's policy states that performance-based contracting methods[33] will be applied to eFAST contracts to the maximum extent practicable; yet, none of the 40 eFAST procurements we examined used these methods.

Similarly, FAA's multibillion-dollar Systems Engineering (SE) 2020 multiple-award contracts are intended to save the Government time and money by using market-based pricing and providing the ability to award task orders on pre-competed contracts. However, we recently reported that despite efforts by FAA management to encourage customers to use SE2020 as the primary vehicle for satisfying NextGen business needs, the Agency did not award as many task orders as anticipated. FAA practices that contributed to the underutilization of SE2020 included (a) using high assessment fees—initially up to 10 percent[34]—to fund program management task orders; (b) lengthy task order processing times; and (c) insufficient policies and guidance for multiple-award contract planning, such as estimating contract hours and costs. These practices, and, according to FAA, a constrained budget environment, resulted in the Agency not achieving its overall program goals for SE2020. To achieve the full benefits of multiple-award contracts and avoid similar shortcomings on SE2025—the successor contract

[32] A multiple-award schedule (vehicle) is a schedule of contracts awarded by an agency for similar or comparable supplies, or services, established with more than one supplier, at varying prices. Multiple-award contracts are intended to streamline the award and ordering process and enable the Government to obtain high-quality supplies and services and take advantage of the latest available technological changes.

[33] Performance-based contracting methods are designed to give contractors the freedom to determine how to meet the Government's performance objectives as long as appropriate performance quality levels are achieved and payment is made only for services that meet these levels.

[34] After several months, FAA subsequently lowered the assessment fee to 5 percent and reimbursed the 5 percent difference to customers who paid the initial 10 percent assessment. FAA eliminated the assessment fee in September 2015; instead, SE2020 vendors directly charge for program management costs within each task order.

vehicle to SE2020—FAA must ensure that it consistently implements adequate policies and procedures rooted in Governmentwide best practices.

In addition, DOT faces oversight challenges while seeking to meet its research goals through innovative procurement methods. Several DOT agencies—including FAA, the Federal Highway Administration, the National Highway Traffic Safety Administration, and the Pipeline and Hazardous Materials Safety Administration—conduct critical safety and modernization research through partnerships with third parties using a variety of delivery methods. These include cooperative agreements[35] and other transaction agreements (OTA).[36] However, our audit on the Department's use of OTAs last year found that FAA in particular did not encourage competition, properly implement cost-benefit analyses, or monitor cost sharing when making awards with this innovative mechanism. In our ongoing work on DOT's oversight of research and development awards, we are similarly examining whether the Department's use of cooperative agreements has properly considered competitive procedures and potential conflicts of interest. Overall, as the Department continues to pursue innovative and streamlined procurement practices, it must ensure it meets key objectives for enhancing competition, controlling spending, and achieving program goals.

Strengthening Agency Oversight of DOT Assets, Contracts, and Grants

Our work continues to identify challenges and opportunities to improve the Department's oversight of assets, contracts, and grants in order to put taxpayer dollars to better use. For example, over the past 2 years, one-third of the 617 cases opened by our Office of Investigations involved procurement and grant fraud and resulted in 42 convictions, 29 years of incarceration, and $18.3 million in financial recoveries. These significant case outcomes, often worked in cooperation with the Department, serve in part to help deter contract and grant fraud within the Federal Government.

In addition, our audits of disaster-recovery spending in the wake of Hurricane Sandy demonstrate that the Department has opportunities to improve its oversight of recipients' use of disaster-recovery funds and guard federally funded assets against future natural disasters. For example, DOT grant recipients

[35] A cooperative agreement is a legal instrument of financial assistance between a Federal awarding agency and a non-Federal entity that is used to carry out a public purpose authorized by a law other than acquiring property or services for the Federal Government's direct benefit. A cooperative agreement is different from a grant in that it provides for substantial collaboration between the Federal awarding agency and the non-Federal entity.
[36] OTAs are legally binding instruments that may be used to engage industry and academia for a broad range of research and prototyping activities. OTAs are not contracts, grants, or cooperative agreements. As such, they are not subject to the Federal laws and regulations that apply to Government procurement contracts (e.g., the FAR) or financial assistance.

experienced more than $171 million in damage to their rolling stock[37] during Hurricane Sandy. Preliminary results from our ongoing work indicate that while the Federal Transit Administration's (FTA) Emergency Relief Manual provides suggestions for protecting rolling stock during such emergencies, FTA has additional opportunities to encourage transit agencies to take actions in response to these suggestions and to share lessons learned with other transit agencies.

The Department also can improve management of its real property assets. Our recent examination of FAA's portfolio of Agency-leased offices and warehouses—representing a total potential value of $1.4 billion—found issues with inadequate management. These included inaccurate data in FAA's real estate database and an ineffective strategic planning process for identifying opportunities to more efficiently use existing space and comply with the Agency's space utilization standards. As a result of these weaknesses, FAA missed opportunities to realize cost savings, including an estimated $14.6 million in potential missed rent reduction opportunities on unused or vacant space.

Finally, the Department's oversight efforts for a range of acquisitions and grant programs have relied in part on contractor assistance. For instance, the Federal Railroad Administration (FRA) has recently turned to Monitoring and Technical Assistance Contractors for oversight of its $8 billion High-Speed Intercity Passenger Rail program. Similarly, FTA has used Project Management Oversight Contractors to oversee federally funded major capital projects, including some Hurricane Sandy recovery projects. While such actions can supplement DOT staff and bring expertise to the review of engineering plans, schedules, and financial plans, our work has found that a consistent process must be set up for documenting contractor reviews and ensuring they are properly executed. DOT agencies have taken action to address our recommendations in these areas; however, the use of contractors for contract and grant oversight will continue to pose both opportunities and challenges as the Department works to ensure effective stewardship of its grants and contracts. Given the Department's upcoming major buying initiatives, such as the Maritime Administration's planned major acquisition for training ships, ensuring strong oversight using DOT's acquisition resources will remain a significant challenge for the Department.

Defining New Roles and Responsibilities as Use of Public-Private Partnerships Increases

Rising demands on the transportation system and constraints on public resources have led the Department to seek innovative financing arrangements for transportation projects, such as enabling greater private sector involvement in

[37] Rolling stock includes vehicles such as buses, vans, cars, railcars, locomotives, trolley cars and buses, and ferry boats, as well as vehicles used for support services, as defined in the Buy America regulations, 49 CFR § 661.3.

delivering highway and transit infrastructure through public-private partnerships (P3).[38] P3s allow a private partner to participate in some combination of a project's design, construction, financing, operations, and maintenance. However, the transfer of responsibilities to the private sector poses risk to all parties—including the Federal Government—if the private partner is unable to meet performance standards or becomes financially insolvent during the project.

P3s are complex transactions and mark a shift away from traditional ways of procuring and financing projects solely with Government funding. With increased use of P3s, the Department will need to apply sufficient due diligence and technical expertise. FHWA—which is responsible for stewardship and oversight of Federal-aid highway, bridge, and tunnel P3 projects—issued guidance in January 2015 outlining staff oversight roles for P3s. However, preliminary results from our ongoing review of FHWA's processes for approving and monitoring P3 projects show that the guidance does not reflect organizational changes that have impacted its roles and responsibilities. For example, the Department's recently established Build America Bureau provides information, expertise, and Federal financing to facilitate P3 projects through various financial credit assistance and grants, but FHWA has not incorporated these changes into its guidance. Defining roles and responsibilities for all parties involved in exercising oversight will help to ensure private partners conform to Federal requirements and meet their project delivery goals. We expect to make recommendations for improvement in our final report.

Related Documents and Recommendations

The following documents as well as the current status of OIG recommendations can be found on our website at http://www.oig.dot.gov.

Title	Total Recommendations	Open Recommendations
FAA's Management and Oversight Are Inadequate To Secure Timely and Cost-Efficient Agency-Leased Offices and Warehouses (April 11, 2018)	12	12
Improvements Could Be Made in FAA's Award and Oversight of SE2020 Acquisition Program Task Orders (February 28, 2018)	11	11

[38] P3s are contractual agreements between public agencies and private sector entities for delivering and financing transportation projects.

Title	Total Recommendations	Open Recommendations
DOT and FAA Lack Adequate Controls Over Their Use and Management of Other Transaction Agreements (September 11, 2017)	17	15
Opportunities Exist for FAA To Strengthen Its Award and Oversight of eFAST Procurements (May 8, 2017)	8	1
FTA Did Not Adequately Verify PATH's Compliance With Federal Procurement Requirements for the Salt Mitigation of Tunnels Project (March 28, 2016)	3	0
Total	**51**	**39**

For more information on the issues identified in this chapter, please contact Mary Kay Langan-Feirson, Assistant Inspector General for Acquisition and Procurement Audits, at (202) 366-5225.

Exhibit. List of Acronyms

APA	Allied Pilots Association
BUILD	Better Utilizing Investments to Leverage Development grant program
CSAM	Cybersecurity Assessment and Management system
DataComm	Data Communications
DOT	Department of Transportation
eFAST	Electronic FAA Accelerated and Simplified Tasks
ERAM	En Route Automation Modernization program
FAA	Federal Aviation Administration
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FISMA	Federal and Information Security Management Act
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GAO	Government Accountability Office
LNG	liquefied natural gas
MAP-21	Moving Ahead for Progress in the 21st Century Act
NAS	National Airspace System
NEPA	National Environmental Policy Act
NextGen	Next Generation Air Transportation System
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
NOAA	National Oceanic and Atmospheric Administration

OCIO	Office of Chief Information Officer
ODI	NHTSA Office of Defects Investigation
OIG	Office of Inspector General
OTA	Other Transaction Agreement
P3	Public-Private Partnership
PBN	Performance-Based Navigation
PE	Preliminary Engineering
PHMSA	Pipeline and Hazardous Materials Safety Administration
PLA	project level agreements
PTC	Positive Train Control
R&D	research and development
RSIA	Rail Safety Improvement Act of 2008
SE	Systems Engineering
SENSR	Spectrum Efficient National Surveillance Radar program
SMS	Safety Management System
SOC	Security Operations Center
SSO	State Safety Oversight
TIGER	Transportation Investment Generating Economic Recovery grant program
TSA	Transportation Security Administration
UAS	Unmanned Aircraft Systems

Memorandum

U.S. Department of Transportation
Office of the Secretary of Transportation

Subject: **INFORMATION:** Management Response to the Office of Inspector General (OIG) Draft Report: DOT's Fiscal Year 2019 Top Management Challenges

10/26/18

From: Lana Hurdle
Acting Chief Financial Officer and
Assistant Secretary for Budget and Programs

To: Mitchell Behm
Deputy Inspector General

The OIG's Fiscal Year (FY) 2019 Top Management Challenges report refers to many of the risks the Department of Transportation (DOT or Department) has identified and is actively addressing. Safety is the top priority of the Department, and we have adopted a systemic approach to safety oversight and management. This approach uses data and performance measures to determine priorities, evaluate risk mitigation strategies, guide safety standards, and ensure the effective integration of those standards into organizational structures and business process.

A second Departmental priority is investing in the nation's infrastructure, while also providing thorough attention, accountability, and oversight of these investments. For example, through discretionary grant-making, the Department is actively targeting Federal investments toward transportation projects that address high-priority infrastructure and safety needs. Without appropriate investment, deteriorating infrastructure could affect the safety and mobility of our nation's citizens, harm the flow of services, and risk disrupting our nation's commerce and economy.

Supporting innovation, while also ensuring the safe integration of new technologies into our transportation system, is a third priority of the Department. Emerging technologies can offer benefits in efficiency, access to transportation, and safety. DOT is working with the public and private sectors to safely develop, test, and integrate these new technologies into our existing transportation systems.

A fourth priority, which in many ways is the government's number one mission, is accountability. DOT must ensure that every dollar spent is used to the maximum benefit of the taxpayer. The Department is committed to regulatory reform that advances its core safety mission while making rules more streamlined and cost-effective. Accountability at the Department also means exercising proper management and oversight of its contracts and grants

to improve program performance and prevent fraud, waste, and abuse. In addition, we want to ensure that efficient and effective internal controls, processes, and procedures are in place and appropriately implemented. For example, to help strengthen oversight of DOT assets, DOT is implementing a shared services model for delivering its acquisitions, human resources, and information technology (IT) functions. This effort will streamline management and ensure policies and practices are applied consistently while providing opportunities to procure goods and services on a larger, more strategic scale.

We expect the Office of Inspector General to be a partner in these efforts, and the Department will work with OIG to identify fraud, waste, abuse, or mismanagement in the Department's programs, activities, or operations.

We appreciate the opportunity to respond to the OIG draft report. Please contact Madeline M. Chulumovich, Director, Office of Audit Relations and Program Improvement, at (202) 266-6512, with any questions.

U.S. DOT OIG

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Our Mission

OIG conducts audits and investigations on behalf of the American public to improve the performance and integrity of DOT's programs to ensure a safe, efficient, and effective national transportation system.

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