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DEPARTMENT OF TRANSPORTATION

Key Issues and Management Challenges, 2013

Statement of Phillip R. Herr, Managing Director, Physical Infrastructure Issues

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Highlights

Highlights of GAO-13-402T, a testimony before the Subcommittee on Transportation, Housing and Urban Development, and Related Agencies, Committee on Appropriations, House of Representatives

Why GAO Did This Study

The nation's transportation system—including highways, airways, pipelines, and rail systems that move both people and freight—is critical to the economy and affects the daily lives of most Americans. However, this system is under growing strain, and estimates of the cost to repair and upgrade the system to meet current and future demands are in the hundreds of billions of dollars. At the same time, traditional funding sources—in particular motor fuel and truck-related taxes—are eroding and the federal government faces long-term fiscal challenges. Addressing these challenges will require looking across federal activities and reexamining all types of federal spending and tax expenditures.

DOT is the principal agency responsible for implementing national transportation policy and administering most federal transportation programs. This statement discusses four key management challenges facing DOT: (1) leveraging surface transportation investments to further national interests, (2) improving surface and aviation transportation safety, (3) effectively implementing the Next Generation Air Transportation System and (4) improving information security. This statement is based on GAO's previous reports and testimonies, which are listed at the end of the statement. GAO has made a number of recommendations to DOT to more effectively leverage the departments' investments and enhance the safety of the traveling public, among other areas. DOT actions underway to address these recommendations are described in this statement.

View GAO-13-402T. For more information, contact Phil Herr at (202) 512-2834 or herrp@gao.gov.

What GAO Found

Leveraging surface transportation investments to further national interests: The Department of Transportation (DOT) faces several challenges leveraging investment in surface transportation networks to meet national goals and priorities. For example, DOT has to transition to a goal-oriented, performance-based approach for highway and transit programs, as required by the Moving Ahead for Progress in the 21st Century Act (MAP-21). Successfully implementing a performance-based approach entails new responsibilities for DOT since, as GAO has previously reported, its program oversight has generally been process-oriented rather than outcome-oriented. DOT also faces challenges related to targeting funds to priorities like the nation's freight network, effectively managing discretionary grant and credit assistance programs, and effectively overseeing other programs, such as the federal-aid highway program.

Improving surface and aviation transportation safety: GAO's recent work on safety across all modes has highlighted the need for improved data reliability and oversight. For example, data are critical for identifying commercial motor vehicles that pose the highest safety concerns. In 2012, GAO recommended that the Federal Motor Carrier Safety Administration (FMCSA) develop a data-driven approach to target carriers operating illegally by attempting to disguise their former identities and expand this approach to examine all new motor carriers. FMCSA is currently working to develop such a data-driven approach. Aviation safety data collection and oversight also can be improved. For example, limitations in flight activity (e.g., flight hours) and other data preclude a complete assessment of general aviation safety. GAO recommended, among other things, that the Federal Aviation Administration (FAA) require the collection of general aviation aircraft flight-hour data in ways that minimize the impact on the general aviation community and set safety improvement goals for individual general aviation industry segments, which FAA is working to address.

Effectively implementing the Next Generation Air Transportation System (NextGen): NextGen is intended to transform the current radar-based system to an aircraft-centered, satellite navigation-based system. FAA faces three key challenges going forward. One challenge is delivering procedures and capabilities that provide aircraft operators with a return on investment in NextGen avionics to incentivize further investments. FAA also faces challenges keeping key NextGen acquisitions within cost estimates and on schedule. NextGen implementation will be affected by how well FAA manages the program's interdependencies, as delays in one program can affect timeframes for other programs and overall acquisition and maintenance costs. Finally, FAA faces challenges managing the transition to NextGen. FAA will have to balance its priorities to ensure that NextGen implementation stays on course while continuing to maintain current equipment and facilities. FAA's modeling indicates that even if all NextGen technologies are implemented, 14 airports—including some of the 35 busiest—may not be able to meet projected increases in demand.

Improving information security: DOT faces challenges effectively protecting its computer systems and networks. GAO and others have found that DOT has not consistently implemented effective controls to ensure that financial and sensitive information is adequately protected from unauthorized access and other risks.

Chairman Latham, Ranking Member Pastor, and Members of the Subcommittee:

I appreciate the opportunity to participate in this hearing to discuss key issues and management challenges facing the Department of Transportation (DOT), as Congress deliberates transportation policy and funding issues. A safe and efficient transportation system is critical to our economy and affects the daily lives of most Americans. Our nation has built vast systems of roadways, airways, railways, transit systems, pipelines, and waterways that help move people and goods. However, these systems are under growing strain, and the cost to repair and upgrade them to meet current and future demands is estimated in the hundreds of billions of dollars. The economic and environmental implications are significant—including wasted fuel, lost time, and increased costs to businesses—as cars idle in traffic and airline passengers confront delays.

The need for increased investment to repair and upgrade the transportation system is occurring at the same time the federal government faces long-term fiscal challenges. Absent policy changes, the federal government will confront increasingly large, persistent, and ultimately unsustainable federal deficits and debt. Addressing these challenges will require looking across federal activities and reexamining all types of federal spending and tax expenditures.[1] To a large degree, our transportation programs operate on a "user pay" system, wherein users contribute to the building and upkeep of transportation systems. For surface transportation programs, for example, motor fuel and other truck-related taxes support the Highway Trust Fund. However, Congress has transferred general revenues to the Highway Trust Fund in recent years to avoid shortfalls and sustain authorized levels of funding. Such transfers may not be sustainable given competing demands for funds and the federal government's fiscal challenges. Congress and the administration need to agree on a long-term plan for funding surface transportation; for this and other reasons, funding surface transportation remains on GAO's High Risk List in 2013.[2]

[1]GAO-13-148SP.

[2]GAO-13-283.

Although our nation's transportation system is owned and operated by multiple levels of government and the private sector, DOT is the principal agency responsible for implementing national transportation policy and administering most federal transportation programs. My statement today focuses on four key issues and management challenges DOT faces:

- leveraging surface transportation investments to further national interests,
- improving surface and aviation transportation safety,
- effectively implementing the Next Generation Air Transportation System (NextGen), and
- improving information security.

My statement is based on a body of work that we have completed from June 2007 through March 2013, including recommendations we have made to both DOT and Congress. This body of work was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. A list of related GAO products is included as an appendix to this statement, along with footnoted references to these products throughout the statement.

Leveraging Surface Transportation Investments to Further National Interests

Given the condition and needs of the transportation system and the federal government's fiscal outlook, DOT faces several challenges in leveraging investment in surface transportation networks to further national interests. More specifically, DOT faces challenges related to (1) transitioning to a goal-oriented, performance-based approach, (2) targeting funds to national priorities such as our freight network, (3) effectively managing discretionary grant and credit assistance programs, and (4) effectively overseeing programs and spending.

Since I testified on this topic last year, there has been progress in clarifying federal goals and roles and linking federal programs to performance, as GAO has recommended. In past work, we reported that many federal transportation programs do not effectively address key challenges, have unclear federal goals and roles, and lack links to

performance. As a result, we made several recommendations and matters for congressional consideration to address these findings.[3] In July 2012, the President signed into law the Moving Ahead for Progress in the 21st Century Act (MAP-21)[4] that included provisions to move toward a more performance-based highway and transit program. For highways, for example, the act identified seven national performance goals for areas including pavement and bridge conditions, fatalities and injuries, and traffic congestion. MAP-21 also provides for the creation of performance measures and targets and links funding to performance, thus enhancing accountability for results.

Successfully implementing a performance-based approach entails new responsibilities for DOT and its operating administrations. For example, MAP-21 requires that the Secretary of Transportation initiate a rulemaking to establish the required performance measures for highways in consultation with states and others. After performance measures are set, states and other grantees must establish performance targets for those measures and report their progress to the Secretary. While some operating administrations, such as the National Highway Traffic Safety Administration (NHTSA), have been working toward such a performance-based framework for several years, the work to implement MAP-21 requirements will require collaborating with multiple nonfederal partners over several years. DOT also faces institutional challenges in implementing performance-based programs. First, its administration and oversight of programs have tended to be process-oriented, rather than outcome-oriented. For example, we have reported that the Federal Highway Administration's (FHWA) and the Federal Transit Administration's (FTA) oversight of statewide and metropolitan planning focuses on process rather than specific transportation outcomes, making it unclear if states' investment decisions are improving the condition and performance of the nation's transportation system.[5] For FTA's triennial review program, which evaluates grantee adherence to federal requirements, we found that FTA evaluates the process—specifically, the timeliness of steps in the process—but not the outcome and quality of the program.[6] Second, based on our work on FHWA's oversight of the

[3]GAO-08-400, GAO-09-868, GAO-09-219, GAO-11-77, and GAO-11-234.

[4]Pub. L. No. 112-141, 126 Stat. 405 (2012).

[5]GAO-09-868 and GAO-11-77.

[6]GAO-09-603.

federal-aid highway program, FHWA will have to overcome risks related to its partnership approach with the states to move to a more performance-based approach to monitor states' progress and hold states accountable for meeting performance targets. We found advantages to FHWA's partnership approach with the states but also identified risks such as lax oversight, a reluctance to take corrective action, and a lack of independence in decision making.[7]

Recent actions, including those set forth in MAP-21, also provide opportunities to better align investments in areas of national interest—such as the freight network—to national goals. The movement of freight over highways, railroads, and waterways is critical to the economy and the livelihood of Americans who rely on freight transportation for food, clothing, and other essential commodities. We have previously reported that the fragmented federal approach to freight surface transportation has resulted in programs having different oversight and funding requirements and a lack of coordination.[8] Last year, MAP-21 established a national freight policy and mandated that DOT develop a *National Freight Strategic Plan* including national goals and performance targets, as GAO has recommended.[9] In order to implement this more holistic, performance-based approach, DOT will have to effectively coordinate sector transportation agencies at the federal, state, and local levels and private sector entities that play a role in freight mobility. These entities and agencies have not necessarily worked in a coordinated manner in the past. DOT will also have to work with the U.S. Army Corps of Engineers (Corps), the lead federal agency responsible for maintaining and improving navigable waterways. DOT and the Corps signed a memorandum of understanding in March 2012 to identify and capitalize on opportunities to improve the nation's marine transportation infrastructure investments. Specifically, DOT and the Corps agreed to develop project prioritization criteria and coordinate project evaluation and selection processes as they relate to DOT grant programs and the Corps' project prioritization. Historically, however, there has been limited coordination between the two agencies. Involving the Corps is essential,

[7]GAO-12-474.

[8]GAO-12-342SP.

[9]GAO-08-287, GAO-07-718, GAO-07-770.

since the vast majority of the nation's freight is imported and exported via navigable waterways through our nation's ports.

Beyond challenges associated with implementing these changes driven primarily by MAP-21, DOT also faces challenges effectively managing existing discretionary grant programs. Most federal surface-transportation funding has been delivered through formula grant programs that have only an indirect relationship to needs and allow states and other grantees considerable flexibility in selecting projects to fund. Meritorious projects of national or regional significance, in particular those that connect transportation modes or cross geographic boundaries, may not compete well for these formula grants.[10] Therefore, allocating some portion of federal funds for surface transportation on a competitive basis—as is done in many discretionary programs[11]—for projects of national or regional significance in particular, is a direction we have recommended to more effectively address the nation's surface transportation challenges.[12] Below we highlight key issues based on our work on two DOT discretionary programs.[13]

- *Transportation Investment Generating Economic Recovery (TIGER) program*: The TIGER program represented an important step toward investing in projects of regional and national significance on a merit-based, competitive basis. Since 2009, DOT has held four rounds of competition and awarded more than $3 billion in grants to highway, transit, rail, port, and other projects. In March 2011 we reported that while DOT developed a sound set of criteria to evaluate applications and select grantees, there was a lack of documentation of final award

[10]GAO-11-234.

[11]Under discretionary grants, or a merit-based approach, agency officials have the authority to determine which eligible grant applicant will receive awards based on eligibility and selection criteria as established by law, regulation, or on an administrative basis and how much each will be awarded.

[12]GAO-08-400 and GAO-11-234.

[13]We have also done work on three national and regional infrastructure programs—Projects of Regional and National Significance, the National Corridor Infrastructure Improvement Program, and the Coordinated Border Infrastructure program. See GAO-09-219.

decisions.[14] As a result, we recommended that DOT better document these decisions. DOT has not implemented this recommendation. In its work on the TIGER program, DOT's Office of the Inspector General (OIG) found that while grantees had developed performance measures, as required, these measures were generally not outcome based and thus could not be used to assess whether projects were meeting the expected outcomes articulated in their applications, such as improving the state of infrastructure and enhancing safety.[15] Going forward, documenting key decisions for all major steps in the review of competitive grant applications will help improve transparency and help to ensure the credibility of DOT's award decisions. In addition, establishing a process for evaluating program performance based on project outcomes will be important for DOT to be able to measure the impacts of these investments.

- *High Speed Intercity Passenger Rail (HSIPR) grant program*: The HSIPR program, administered by the Federal Railroad Administration (FRA), provides funds to states and others to develop high-speed rail and inter-city passenger-rail corridors and projects. Congress appropriated $8 billion for high-speed rail and inter-city passenger rail in the American Recovery and Reinvestment Act of 2009 (Recovery Act) and $2.5 billion in the fiscal year 2010 DOT Appropriations Act.[16] As of October 2012, about $9.9 billion has been obligated for 150 projects in 34 states and the District of Columbia—with more than one third designated for a single project in California.[17] While most of the program's funds have been obligated, we have highlighted key

[14]GAO-11-234. DOT's criteria for awarding TIGER grants included improving the state of repair of existing infrastructure, increasing economic competitiveness, and enhancing safety. Projects were evaluated, based in part, on their ability to foster partnerships, leverage additional (nonfederal) funding, and create complete fully operable segments upon completion.

[15]Department of Transportation, Office of Inspector General, *DOT Established Timely Controls for the TIGER Discretionary Grants Program but Opportunities Exist to Strengthen Oversight*, Report Number MH-2012-188 (Sept. 20, 2012).

[16]The HSIPR grant program has not received appropriations since fiscal year 2010, and future federal funding is uncertain. For fiscal year 2011, $400 million in unobligated funds were rescinded.

[17]We have ongoing work assessing the reliability of the California High Speed Rail project's cost estimates and financing plans, evaluating the reasonableness of ridership and revenue forecasts, and examining the comprehensiveness of potential project economic impacts. We expect to issue our report on this work in April 2013.

challenges that FRA faces managing this program. In 2009, we recommended that FRA develop guidelines and methods for ensuring reliability of ridership and other forecasts used to determine the viability of high-speed rail projects.[18] According to FRA, this recommendation is in the process of being implemented, and FRA officials stated that the agency is working to develop a comprehensive approach for improving the reliability of ridership forecasts. The DOT OIG reported that FRA faces substantial challenges to ensure the HSIPR program meets reporting, transparency, and program and financial management requirements under the Recovery Act and that Recovery Act funding that has been obligated for HSIPR projects is not wasted. In addition, FRA will have to transition from its role of awarding grants to overseeing the implementation of HSIPR-funded projects, including overseeing the implementation of the California High Speed Rail project which has a current cost estimate of $68.4 billion.

In addition, DOT faces challenges implementing and managing changes to the Transportation Infrastructure Finance and Innovation Act (TIFIA) program, which provides direct loans, loan guarantees, and lines of credit to surface transportation projects.[19] MAP-21 made several changes to the TIFIA program, including a dramatic increase in the funding available for the program. Such changes—coupled with TIFIA's already complex mission to leverage limited federal resources and stimulate private capital investment in transportation infrastructure by providing credit assistance to projects of national or regional significance—constitute new challenges. MAP-21 authorized $750 million for fiscal year 2013 and $1 billion for fiscal year 2014 to pay the subsidy cost of credit assistance, compared to $122 million in authorized budget authority in previous years.[20] MAP-21 also made changes to the process DOT uses to select projects and increased the portion of project costs TIFIA loans can cover from 33 to 49 percent. As we reported in 2012, with the increase in budget authority, DOT will likely have a higher number of applications to

[18]GAO-09-317.

[19]23 U.S.C. §§ 601-609.

[20]DOT also uses budget authority to pay the program's administrative expenses. The subsidy cost of credit assistance covers the estimated long-term cost to the government (which includes defaults, delinquencies, and interest subsidies) of providing assistance. According to DOT, $10 million in TIFIA budget authority can generally be leveraged to provide $100 million in credit assistance.

review and credit agreements to negotiate.[21] DOT faces challenges implementing these changes—including updating guidance, issuing new regulations, and ensuring that adequate staff and expertise exist to efficiently manage the expanded program—all while TIFIA credit assistance remains in high demand. Moreover, as the TIFIA portfolio grows, now totaling more than $10 billion in loans and other assistance, DOT will have to monitor an increasing number of projects as they proceed through what is expected to be decades of loan repayment to manage current and future risk from potential nonrepayment.

DOT also faces challenges overseeing other programs going forward. The federal-aid highway program, and thus FHWA's oversight role, has expanded over the years to encompass broader goals, more responsibilities, and a variety of approaches. FHWA has taken steps to improve its approach to managing this program's risks by, for example, requiring field offices to identify risks, assess them based on their potential impact and the likelihood they will occur, and develop response strategies in their planned oversight activities.[22] However, in addition to overcoming the risks associated with its partnership with the states, opportunities for improvement in other areas remain. In 2011, for this Subcommittee, we reviewed FHWA's Emergency Relief Program, which provides funds to states to repair roads damaged by natural disasters and catastrophic failures, and were unable to determine the basis on which FHWA made many eligibility determinations because of missing or incomplete documentation. Without clear and standardized procedures for FHWA officials to make and document eligibility decisions, FHWA lacks assurance that only eligible projects are approved to receive scarce relief funds.[23] In June 2012, in response to a GAO recommendation, FHWA reviewed each state's balance of unused emergency relief funds on a monthly basis so that unused funding can be more easily identified and withdrawn. This resulted in savings of about $231 million in unused allocations in fiscal year 2012 which was made available to other priority Emergency Relief Program projects. In addition, FTA is implementing a new Public Transportation Emergency Relief Program established in July 2012 in MAP-21,[24] for which Congress recently appropriated this

[21]GAO-12-641.

[22]GAO-09-751.

[23]GAO-12-45.

[24]Pub. L. No. 112-141, § 20017, 26 Stat. 405, 703-706.

program's first funds—$10.9 billion—to restore transit services affected by Hurricane Sandy.[25] As FTA implements this new program and distributes funds, assurance that only eligible projects receive funds and that processes support effective and efficient delivery of relief services is of particular importance.

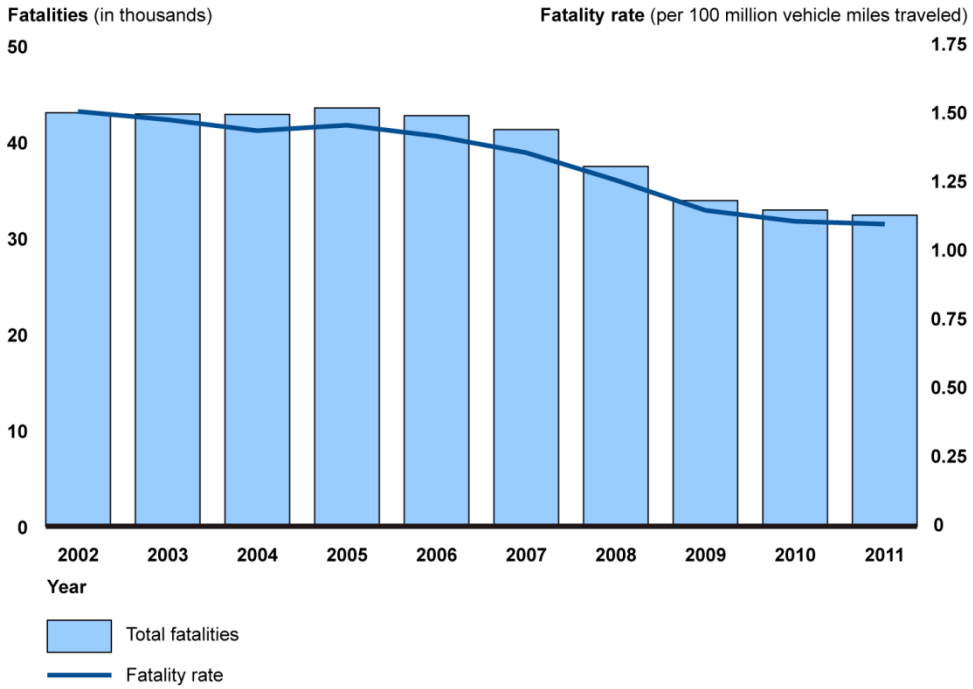
Improving Surface and Aviation Transportation Safety

Another challenge that DOT and the states continue to face is improving safety. The vast majority of transportation-related fatalities and injuries occur on our roadways, involving drivers and passengers in cars and large trucks, motorcyclists, pedestrians, and cyclists. We have seen a remarkable decline in traffic fatalities and injuries in recent years. Specifically, traffic fatalities and injuries decreased nearly 24 percent over the last decade, from about 43,000 fatalities and 2.9 million injuries in 2002 to about 32,000 fatalities and 2.2 million injuries in 2011. (See fig. 1.) While these trends are encouraging, NHTSA's early estimates of traffic fatalities for the first 9 months of 2012 project a 7 percent increase in fatalities, which would be the first increase since 2005. Continued federal and state efforts to reduce traffic fatalities and injuries are needed, particularly in areas where the risks of crashes, fatalities, and injuries are high, such as motorcyclist, teen driver, and distracted-driving crashes.[26]

[25]Supplemental Appropriations to Approve and Streamline Disaster Assistance for Hurricane Sandy, Pub. L. No. 113-2, 127 Stat. 4, 35-36 (2013).

[26]GAO-10-544 and GAO-13-42.

Figure 1: Traffic Fatality Rates and Total Number of Fatalities, 2002 to 2011



Source: NHTSA.

While other surface transportation modes—such as rail, transit, and pipeline—are relatively safe when compared to roadways, accidents can and do occur. For example, a natural gas pipeline explosion in San Bruno, California, in September 2010 killed 8 people and damaged or destroyed over 100 homes, and a hazardous liquid pipeline rupture near Marshall, Michigan, in July 2010 spilled over 840,000 gallons of crude oil into a wetland area. Likewise, although 2012 was the safest year in rail industry history, three notable freight rail accidents occurred during the summer of 2012—including the derailment of a freight train in Columbus, Ohio, which caused the evacuation of homes in the area because of a fire caused by exploding ethanol tank cars.

In addition, while the nation's aviation system is one of the safest in the world, with air travel projected to increase over the next 20 years, efforts to ensure continued safety are increasingly important. To enhance safety, the Federal Aviation Administration (FAA) is shifting to a data-driven, risk-based safety oversight approach—called a safety management system (SMS) approach. Implementation of SMS is intended to allow FAA to

proactively identify system-wide trends in aviation safety and manage emerging hazards before they result in incidents or accidents.

Our recent work on transportation safety across all modes has highlighted the need for improvement in data and oversight. With the move toward a more performance-based approach in MAP-21, high-quality data are essential to identify progress and ensure accountability. As DOT moves closer to a data-driven, performance-based structure, a robust oversight approach is critical to ensure that states are establishing appropriate goals and making sufficient progress toward those goals.

- For traffic safety data, states maintain six core types of data systems that are used to identify priorities for highway and traffic safety programs.[27] In 2010, we reported that NHTSA's periodic assessments designed to help states evaluate the quality of their data systems were in some cases incomplete or inconsistent.[28] We recommended actions for DOT to make those assessments more useful for states, and DOT plans to complete implementation of those actions this spring.

- Data are also critical for the Federal Motor Carrier Safety Administration (FMCSA) to target resources and identify which of the hundreds of thousands of commercial motor vehicles operating on our nation's roads pose the highest safety concerns. For example, we recently reported that FMCSA only examines about 2 percent of new motor carrier applicants that register annually to identify carriers operating illegally under new identities. We recommended that FMCSA develop a data-driven approach to target new carriers attempting to disguise their former identities and expand this new approach to examine all motor carriers.[29] FMCSA is currently developing a plan to enhance its ability to identify unsafe motor carriers that try to disguise their former identities and expects to complete the development of a data-driven approach by February 2013. Further, industry representatives, shippers and brokers, and other stakeholders are questioning the validity of certain aspects,

[27]The six core types of systems are vehicle, driver, roadway, crash, citation and adjudication, and injury surveillance.

[28]GAO-10-454.

[29]GAO-12-364.

such as the accuracy and consistency of data inputs and the reliability of carrier performance scores resulting from FMCSA's Compliance, Safety, Accountability (CSA) initiative—a data-driven approach to select the highest risk carriers for intervention. We are currently evaluating this approach and plan to report on this and other aspects of the CSA program later this year.

- FRA is responsible for overseeing efforts made by railroads in developing positive train control (PTC), a communications-based system designed to prevent some serious train accidents; progress in these efforts has been a concern. Federal law requires major freight and passenger railroads to implement this system on most major routes by the end of 2015. In 2010, we reported that delays in developing some system components as well as costs that publicly funded commuter railroads would incur to implement the system raised the risk that railroads would not meet the 2015 deadline.[30] In 2012, in response to our recommendation, FRA reported to Congress on the railroads' progress in implementing PTC noting that it was unlikely most railroads would be able to meet the 2015 deadline. Further, FRA identified obstacles and recommended factors to consider in developing additional legislation. We are currently reviewing how FRA estimated the costs and benefits of PTC in its rulemaking process and to what extent railroads will be able to leverage PTC technology to achieve benefits in addition to the anticipated safety improvements.

- MAP-21 authorized FTA to establish and enforce basic safety standards for transit rail systems and required the agency to develop a new safety oversight program, with a continued role for state safety oversight offices that meet certain requirements. We have noted that FTA would face challenges in building up its internal capability to develop and carry out such a program, and that state safety oversight agencies would face similar challenges.[31] As FTA moves forward, reliable rail-transit safety data as well as clear and specific goals and measures based on these data will be essential in allowing FTA to monitor safety trends, determine whether safety programs are achieving their intended purposes, target resources, and make informed decisions about the safety strategy. In 2011, we

[30] GAO-11-133.

[31] GAO-10-314T.

recommended improvements in FTA's rail-transit safety database and related goals and measures.[32] FTA officials have informed us that they have taken steps to improve this database, including establishing the appropriate internal controls over their data collection process to prevent data-reporting errors. FTA officials have also informed us that, as part of their efforts to develop their new safety strategy, they are working on developing new goals and measures for the agency's rail-transit safety efforts.

- Data collection and oversight for the safety of our nation's 2.5-million mile pipeline network can also be improved. For example, while the Pipeline and Hazardous Materials Safety Administration (PHMSA) requires pipeline operators to develop incident response plans to minimize the risks of leaks and ruptures, PHMSA has not linked performance measures or targets to measurable response-time goals and does not collect reliable data on actual incident response times. In January 2013, we recommended that PHMSA improve incident response data and use these data to evaluate whether to implement a performance-based framework for incident response times.[33] In addition, part of the nation's pipeline network consists of more than 200,000 miles of onshore "gathering" pipelines, many of which are not federally regulated because they have generally been located away from populated areas and operate at relatively low pressures. However, urban development is encroaching on these pipelines, and the increased extraction of oil and natural gas from shale deposits is resulting in new gathering pipelines that can be larger in diameter and operate at higher pressures. Thus, in March 2012, we recommended that PHMSA collect data on these pipelines to assess their safety risks.[34] In response, PHMSA has initiated a rulemaking to collect data on gathering pipelines.

- Our work has found that FAA continues to experience data-related challenges that affect oversight efforts, including limitations with the analysis it conducts and the data it collects, as well as the absence of data in some areas. For example, we reported that several challenges remain that may affect FAA's ability to implement SMS in an efficient

[32]GAO-11-199.

[33]GAO-13-168. We have not yet received DOT's response to this recommendation.

[34]GAO-12-388.

and timely matter, challenges related to data sharing and data quality, capacity to conduct SMS-based analyses and oversight, and standardization of policies and procedures. As a result, in September 2012 we made several recommendations to FAA regarding the implementation of SMS that FAA is working to address.[35] We also identified data and oversight concerns in FAA's efforts to reduce the general aviation accident rate. For example, while we can draw some conclusions about general aviation accident characteristics, limitations in flight activity (e.g., flight hours) and other data preclude a complete assessment of general aviation safety. GAO has recommended, among other things, that FAA require the collection of general aviation aircraft flight-hour data in ways that minimize the impact on the general aviation community, set safety improvement goals for individual general aviation-industry segments, and develop performance measures for significant activities that aim to improve general aviation safety.[36] FAA is currently working to implement these recommendations. FAA's data-related challenges are affecting other efforts, such as the development of standards for unmanned aerial systems (UAS) operations, a key step in the integration of these systems into the national airspace system. The standards development process has been hindered, in part, because of FAA's inability to use safety, reliability, and performance data from the Department of Defense, by the need for additional data from other sources, and by the complexities of UAS issues in general. FAA is working to address these data limitations; its success in doing so is important in moving forward with the standards development process as well as supporting research and development efforts needed to address the obstacles affecting safe integration of UAS operations.[37]

[35]GAO-12-898.

[36]GAO-13-36.

[37]GAO-13-346T.

Effectively Implementing the Next Generation Air Transportation System (NextGen)

Another area that I would like to address is the implementation of NextGen. This complex multiagency undertaking is intended to transform the current radar-based system into an aircraft-centered, satellite navigation-based system and is estimated to cost between $15 billion and $22 billion through 2025. FAA has taken several steps to improve NextGen implementation and is continuing to address critical issues that we, stakeholders, and others have identified, including three key challenges that affect NextGen implementation: delivering and demonstrating NextGen benefits, keeping key NextGen acquisitions within cost estimates and on schedule, and balancing NextGen implementation with maintaining and operating the current air traffic control system during the transition.

Delivering and Demonstrating NextGen Benefits

FAA must deliver systems, procedures, and capabilities that provide aircraft operators with a return on their investments in NextGen avionics. For example, a large percentage of the current fleet is equipped to fly more precise performance-based navigation (PBN) procedures, which use satellite-based guidance to route aircraft and improve approaches at airports, and can save operators money through reduced fuel use and shorter flight time. However, operators have expressed concern that FAA, to date, has not produced the most useful or beneficial PBN routes and procedures, and therefore, operators do not yet see benefits resulting from their investments in advanced avionics systems. As a means to leverage existing technology, to provide immediate benefit to the industry, and to respond to industry advisory group recommendations, FAA began an initiative to better use PBN procedures to resolve airspace problems in and provide benefits to 13 selected areas around multiple busy airports, known as "metroplexes."[38] FAA is working to design its metroplex and other PBN initiatives to avoid some of the challenges—such as lack of air traffic controller involvement—that have limited the use of PBN procedures and, in turn, limited the potential benefits of existing PBN

[38]The NextGen Advisory Committee (NAC) has made recommendations to help FAA identify and prioritize improvements that could provide more immediate benefits, including recommending that FAA focus NextGen capabilities at metroplexes that have the greatest impact on aviation system performance. FAA's initiative, the Optimization of Airspace and Procedures in the Metroplex (Metroplex), is under way in eight metropolitan areas across the country, including Atlanta and Washington, D.C., and planning is under way for five other areas.

procedures.[39] If operators cannot realize benefits from existing equipment investments, they may be hesitant to invest in the new technologies necessary to fully realize NextGen benefits.

While some operational improvements can be made with existing aircraft equipment, realizing more significant NextGen benefits requires a critical mass of properly equipped aircraft. Reaching that critical mass is a significant challenge because the first aircraft operators to purchase and install NextGen-capable technologies will not obtain a return on their investment until many other operators also adopt NextGen technologies. FAA estimates that the NextGen avionics needed on aircraft to realize significant midterm NextGen capabilities will cost private operators about $6.6 billion from 2007 through 2018. However, aircraft operators may be hesitant to make these investments if they do not have confidence that benefits will be realized from their investments. The FAA Modernization and Reform Act of 2012[40] created a program to facilitate public-private financing for equipping general-aviation and air-carrier aircraft with NextGen technologies. According to FAA, the goal for such a program would be to encourage deployment of NextGen-capable aircraft sooner than would have occurred without such funding assistance in place. FAA is soliciting industry input about how to design and implement a loan guarantee program but has yet to decide on how to incentivize this transition.

As we have previously reported, FAA should regularly provide stakeholders, interested parties, Congress, and the American people with a clear picture of where NextGen's implementation stands, and whether the capabilities being implemented are resulting in positive outcomes and improved performance for operators and passengers. We have recommended that FAA develop a timeline and action plan to work with industry and federal partner agencies to develop an agreed-upon list of

[39]For example, FAA has found that some PBN procedures developed without air traffic controllers' involvement have been used infrequently, if at all, because of problems with the procedure design or other challenges. In response, FAA has worked to include stakeholders, such as air traffic controllers and airlines, in the study and design of new PBN procedures. As we have previously reported, effective outreach to affected stakeholders can help anticipate and address potential community concerns—particularly with regard to noise. If not addressed, these concerns can delay efforts to use airspace more efficiently.

[40]Pub. L. No. 112-95, 126 Stat. 11 (2012).

outcome-based performance metrics, as well as goals for NextGen both at a broad level and in specific NextGen improvement areas.[41] In addition, the FAA Modernization and Reform Act of 2012 requires FAA to report on measures of the agency's progress in implementing NextGen capabilities and operational results.[42] FAA has taken steps to establish NextGen metrics, but much work remains, including finalizing agency targets for specific improvement areas and making a link between NextGen performance goals and metrics and NextGen improvements. For example, publicly available information about FAA's plans for implementing additional capabilities through 2018 lacks specifics about the timing and locations of implementation; this lack of details has been cited as an obstacle to incentivizing aircraft operators to equip with new technologies. Measuring performance of near-term NextGen improvements will be critical for FAA management and stakeholders to assess impacts, make investment decisions, and monitor NextGen progress. We will report on this issue in more detail as part of our ongoing near-term NextGen implementation work for the Congress.

Keeping Key NextGen Acquisitions within Cost Estimates and on Schedule

NextGen has significantly increased the number, cost, and complexity of FAA's acquisition programs; it is imperative that these programs remain on time and within budget, particularly given current budget constraints and the interdependencies of many NextGen-acquisitions. Since our February 2012 report on major air traffic control acquisition programs, the key NextGen-related acquisition programs have generally continued to proceed on time and on budget.[43] However, past delays with the En Route Automation Modernization (ERAM) program—a critical program for NextGen—illustrate how delays can affect overall acquisition and maintenance costs as well as time frames for other programs. As we previously reported, ERAM's delayed implementation from December 2010 to August 2014 and cost increase of $330 million were associated with insufficient testing to identify software issues before deployment at key sites and insufficient stakeholder involvement during system

[41]GAO-10-629.

[42]Pub. L. No. 112–95, § 214, 126 Stat. 50-51.

[43]GAO-12-223.

development and deployment.[44] The delays with ERAM added an estimated $18 million per year to the costs of maintaining the system that ERAM was meant to replace and delayed other key NextGen acquisitions.[45] Since new budget and schedule baselines for the ERAM program were established in June 2011, according to FAA reports, the program has made progress toward its deployment goals. The successful implementation of NextGen—both in the midterm (through 2020) and in the long term (beyond 2020)—will be affected by how well FAA manages such program interdependencies.

Managing the Transition to NextGen

Particularly in light of constrained budget resources, FAA will have to balance its priorities to help ensure that NextGen implementation stays on course. Sustaining the current legacy equipment and facilities remains critical, as these will continue to be the core of the national airspace system for a number of years, and some of the components will be part of NextGen. For example, while FAA transitions to satellite-based aircraft surveillance through the deployment of Automatic Dependent Surveillance-Broadcast Out (ADS-B Out) technology, the agency expects to continue to operate and maintain current radar technology through at least 2020. At that time, FAA is scheduled to make decisions about which radar systems the agency will decommission and which will be maintained as the back-up system for ADS-B. If either ADS-B's deployment or airlines' efforts to purchase and install this technology is delayed, then FAA may have to maintain and operate some of its radars longer than expected.[46]

In addition, to fully realize NextGen's capabilities, facilities that handle air traffic control must be reconfigured. In November 2011, FAA approved an

[44]GAO-12-1011T also noted that ERAM's schedule delays and cost increases were also attributable to unanticipated risks associated with operational complexities at the selected sites and insufficient communication between the program office and field sites.

[45]In part because of ERAM's delay, FAA pushed the Data Communications (Data Comm) program's start date from September 2011 to May 2012, revised the original plan for the first segment of System Wide Information Management (SWIM) to mitigate the impact of ERAM delays on the SWIM program, and delayed the start date for segment 2A of SWIM from 2010 to July 2012.

[46]We have ongoing work that is further exploring how FAA is preparing for the transition to NextGen and balancing the demands of the legacy and NextGen systems.

initial plan to consolidate en route centers and terminal radar approach-control facilities (TRACONs) into large, integrated facilities over the next two decades. However, FAA has yet to make key decisions on how to proceed with this consolidation, and has delayed its decision on where to build the first integrated facility until June 2013. While FAA develops its facilities plan, it faces the immediate task of maintaining and repairing existing facilities so that the current air-traffic control system continues to operate safely and reliably during the NextGen transition. According to FAA, in 2011, 65 percent of its terminal facilities and 74 percent of its en route facilities were in either poor or fair condition with a total deferred-maintenance backlog of $310 million for these facilities. Once FAA develops and implements a facility consolidation plan, it can identify which legacy facilities to repair and maintain and, in doing so, potentially reduce overall facility repair and maintenance costs.[47] FAA has acknowledged the need to keep long-term plans in mind so that it does not invest unnecessarily in facilities that will not be used for NextGen.

Although NextGen is projected to keep delays at many airports from getting worse than would be expected without these improvements, NextGen alone is not likely to sufficiently expand the capacity of the national airspace system. For example, FAA's NextGen modeling indicates that even if all ongoing and planned NextGen technologies are implemented, 14 airports—including some of the 35 busiest—may not be able to meet the projected increases in demand (table 1).[48] The transformation to NextGen will also depend on the ability of airports to handle greater capacity. For example, decisions regarding using existing capacity more efficiently include certifying and approving standards that allow the use of closely spaced parallel runways. At some airports, policies may need to be developed to address situations where demand exceeds capacity (e.g., pricing, administrative rules, service priorities). Infrastructure projects to increase capacity, such as building additional runways, can be a lengthy process and will require substantial advance planning as well as safety and cost analyses. Also, the improved efficiency in runway and airspace use that should result from some

[47]As required by the FAA Modernization and Reform Act of 2012, we are reviewing FAA facility conditions, including identifying any conditions that could interfere with employees' ability to effectively and safely perform their duties. Pub. L. No. 112–95, § 610(a)(3), (c), 126 Stat., 117.

[48]FAA is in the process of updating this analysis and anticipates completing its report in September 2013.

NextGen technologies may exacerbate other airport capacity constraints, such as taxiways, terminal gates, or parking areas. Finally, increasing capacity must be handled within the context of limiting increases in emissions and noise that can affect the communities around airports.

Table 1: Airports Projected to Need Additional Capacity in 2015 and 2025 Even if Planned NextGen Improvements Occur

Airports projected to need capacity in 2015 and 2025 even if planned improvements occur	Airports projected to need capacity in 2025 even if planned improvements occur
Newark Liberty International (EWR)	Hartsfield-Jackson Atlanta International (ATL)
LaGuardia (LGA)	Fort Lauderdale-Hollywood International (FLL)
Long Beach (LGB)	John F. Kennedy International (JFK)
Oakland International (OAK)	McCarran International (LAS)
Philadelphia International (PHL)	Midway International (MDW)
John Wayne (SNA)	Phoenix Sky Harbor International (PHX)
	San Diego International (SAN)
	San Francisco International (SFO)

Source: GAO analysis of FAA data.

Note: FAA is in the process of updating this analysis and anticipates completing its report in September 2013.

Improving Information Security

DOT relies extensively on more than 400 computerized information systems to carry out its financial and mission-related operations. Effective information security controls are required to ensure that financial and sensitive information is adequately protected from inadvertent or deliberate misuse, fraudulent use, and improper disclosure, modification, or destruction. Ineffective controls can also impair the accuracy, completeness, and timeliness of information used by management. The need for effective information security is further underscored by the evolving and growing cyber threats to federal systems and the increase in the number of security incidents reported by DOT and other federal agencies.

DOT has been challenged to effectively protect its computer systems and networks. Our analysis of Office of Management and Budget (OMB), OIG, and GAO reports shows that the department has not consistently implemented effective controls in accordance with National Institute of Standards and Technology (NIST) and OMB guidance in response to the

Federal Information Security Management Act (FISMA).[49] For example, in March 2012, OMB reported that DOT had a 44.2 percent compliance rate with certain FISMA requirements.[50] Although this is a 14.4 percent increase from fiscal year 2010, it is still below many other major federal agencies. In addition, OMB reported that DOT's implementation of automated continuous-monitoring capabilities for asset and configuration management were both below 50 percent of the agency's information technology assets. Further, we have reported on the need for federal agencies, including DOT, to improve their workforce planning, hiring, and development activities for cybersecurity personnel.[51] We recommended that DOT, among other things, update its departmentwide cybersecurity workforce plan or ensure that departmental components have plans that fully address gaps in critical skills and competencies and that support requirements for its cybersecurity workforce strategies. The department neither concurred nor nonconcurred with our recommendations.

In summary, as the principal agency responsible for implementing national transportation policy and administering most federal transportation programs, DOT faces several key challenges going forward in leveraging surface transportation investments, improving surface and aviation transportation safety, effectively implementing NextGen and improving information security. Addressing these challenges in an environment of increasing need and increasing fiscal challenges will require looking at the entire range of federal activities and reexamining federal spending and tax expenditures to improve and enhance these systems that are vital to the nation's economy.

Chairman Latham, Ranking Member Pastor, and Members of the Subcommittee, this concludes my prepared statement. I would be pleased to answer any questions that you may have at this time.

[49]Pub. L. No. 107-296, § 1001, 116 Stat. 2135, codified at 44 U.S.C. ch. 35, subchapter II.

[50]OMB, *Fiscal Year 2011 Report to Congress on the Implementation of the Federal Information Security Management Act of 2002* (Washington, D.C.: Mar. 7, 2012).

[51]GAO-12-8.

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