



Testimony

Before the Subcommittee on Aviation,
Committee on Transportation and
Infrastructure, House of Representatives

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**FEDERAL AVIATION
ADMINISTRATION**

**Challenges Facing the
Agency in Fiscal Year 2008
and Beyond**

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Highlights of [GAO-07-490T](#), a testimony to Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

FAA operates one of the safest air transportation systems in the world. It is, however, a system under strain. The skies over America are becoming more crowded every day. FAA faces the daunting task of safely integrating a growing influx of passengers and aircraft into the system and simultaneously leading the transition to the Next Generation Air Transportation System (NextGen)—a complicated effort to modernize the system. FAA's broad responsibilities to maintain and modernize the nation's air transportation system must be met in an uncertain budgetary and long-term fiscal environment. GAO's concerns about financing the nation's transportation system, including aviation, led GAO to designate this issue as high-risk.

This statement is based on recent reports and interviews with FAA officials. It focuses on FAA's challenges relating to (1) ensuring the continued safe operation of the nation's airspace system, (2) continuing to improve FAA's management while leading the transition to NextGen, and (3) funding issues concerning capital improvements for airports and FAA's reauthorization.

What GAO Recommends

In prior reports, GAO has made recommendations to address data and management problems. Although FAA has begun to address them, many have not been fully implemented.

www.gao.gov/cgi-bin/getrpt?GAO-07-490T. To view the full product, including the scope and methodology, click on the link above. For more information, contact Gerald Dillingham, Ph.D., 202-512-2834, dillingham@gao.gov.

FEDERAL AVIATION ADMINISTRATION

Challenges Facing the Agency in Fiscal Year 2008 and Beyond

What GAO Found

To ensure continued safety within the national airspace system, FAA is using risk-based, data-driven safety programs to oversee the industry; however, the agency faces data and human resource challenges that affect its ability to fully implement these programs. GAO has previously recommended that FAA improve the accuracy and completeness of the safety data and analysis of that data needed to monitor safety trends, fully implement its safety programs, and assess their effectiveness to determine if they are focused on the greatest safety risk. FAA has made progress in this area but more remains to be done. FAA's ability to oversee the aviation industry will be further affected by its ability to hire, train, and deploy its primary workforce of safety inspectors, engineers, and air traffic controllers. The expansion of FAA's oversight program for air carriers will result in workload shifts for its inspectors that will make it important for FAA to improve its staffing process. In addition, the agency estimates that it will lose about 70 percent of the air traffic controller workforce over the next 10 years, primarily due to retirements.

FAA has made significant progress in implementing management processes and systems that use leading practices of private sector businesses; however, further work remains to institutionalize these efforts. For example, new and improved acquisition processes and oversight have contributed to FAA meeting its acquisition cost and schedule goals for the last three years. Additional work remains, though—FAA received a qualified opinion on its most recent financial audit as a result of lack of support for the accuracy of about \$4.7 billion for equipment. Moreover, GAO has previously recommended that FAA should undertake additional efforts to consolidate its facilities and outsource some of its services to further cut costs. Some key challenges for the transition to NextGen include completing the design and cost estimates for NextGen and proposing how that cost will be funded. FAA will also need to assess its capacity to handle the technical and contract management expertise that will be required to oversee the implementation of NextGen.

FAA estimates that the total cost for planned airport development that is eligible for funding from the Airport Improvement Program (AIP) will be about \$42 billion for 2007 through 2011. FAA's budget request for fiscal year 2008 proposes significant cuts in AIP. These cuts, along with changes to the way AIP is allocated among airports and possible increases in the cap on passenger ticket charges for airport projects, could have implications for the amount of funding available for planned airport development, especially at small airports. Additionally, the taxes that fund the Airport and Airway Trust Fund are scheduled to expire at the end of fiscal year 2007. Until Congress reauthorizes those taxes, FAA's ability to carry out programs related to airport development as well as some other programs throughout the agency may be in jeopardy, compounding the safety and management challenges facing FAA.

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to testify before you today as you consider the Administration's budget proposal for the Federal Aviation Administration (FAA) for fiscal year 2008. FAA operates one of the safest air transportation systems in the world. It is, however, a system under strain. The skies over America are becoming more crowded every day. Demand for air travel has increased in recent years, with over 740 million passengers flying in fiscal year 2006, climbing toward an estimated 1 billion passengers per year in 2015, according to FAA estimates. These passengers are expected to find more choices of aircraft in the years ahead, ranging from the jumbo Airbus A380 that can hold more than 500 passengers, to very light jets that might transport 6 or fewer passengers on any given flight. Already with increasing demand has come an increase in flight arrival delays; such delays are nearing the levels of 2000, a year in which 1 in 4 flights reached its destination behind schedule. And although the system remains extraordinarily safe, if the current accident rate continues while air traffic potentially triples in the next 20 years, this country would see nine fatal commercial accidents each year, on average. FAA thus faces the daunting task of safely integrating this expected influx of passengers and aircraft into the system and simultaneously leading the transition to the Next Generation Air Transportation System (NextGen)—an enormously complicated endeavor to transform the air traffic control system.

FAA's broad responsibilities to maintain and modernize the nation's air transportation system must be met in an uncertain budgetary and long-term fiscal environment. We recently reported that the federal government's financial condition and fiscal outlook are worse than many may understand.¹ Additionally, our concerns about financing the nation's transportation system, including the aviation system, led us to designate this issue as high-risk.² These circumstances provide the context for my testimony today. In particular, I will focus on some of the key challenges and issues facing FAA and the Congress as the fiscal year 2008 budget for FAA is considered. These challenges and issues are related to (1) ensuring the continued safe operation of the nation's airspace system, (2) continuing to improve FAA's internal management while leading the

¹GAO, *Fiscal Stewardship: A Critical Challenge Facing Our Nation*, [GAO-07-362SP](#) (Washington, D.C.: January 2007).

²GAO, *High-Risk Series: An Update*, [GAO-07-310](#) (Washington, D.C.: January 2007).

transition to NextGen, and (3) funding issues concerning capital improvements for airports and FAA's reauthorization. My statement is based on our recent reports and updates that we obtained through interviewing FAA officials and reviewing their documentation. We conducted this work in accordance with generally accepted government auditing standards.

In summary:

- To maintain and expand the margin of safety within the national airspace system, FAA is using risk-based, data-driven safety programs to oversee the industry; however, the agency faces data and human resource challenges that affect its ability to fully implement these programs. These challenges are especially important in light of the agency not meeting its performance target for commercial air carrier safety for fiscal year 2006 because of recent fatal accidents and predictions of greatly increased air travel. FAA's approaches to safety require that the agency obtain accurate and complete data to monitor safety trends, fully implement its safety programs, and assess their effectiveness to determine if they are focused on the greatest safety risk. We have previously recommended that FAA improve the accuracy and completeness of its safety data and its analysis of that data. FAA has made progress in this area but more work remains. FAA's ability to oversee the aviation industry and ensure a safe national air space system will be further affected by its ability to hire, train, and deploy its primary workforce of safety inspectors, engineers, and air traffic controllers. The expansion of its oversight program for air carriers will result in workload shifts for its inspector workforce that will make it important for FAA to improve its staffing process and address its lack of a staffing model. In addition, the agency estimates that it will lose more than 10,000, or about 70 percent, of the air traffic controller workforce over the next 10 years, primarily due to retirements. In recent years, air traffic controllers have been retiring at a faster rate than FAA anticipated, exacerbating this hiring challenge.
- FAA has made significant progress in implementing management processes and systems that use leading practices of private sector businesses; however, further work remains to institutionalize these efforts. FAA's progress led us to remove its financial management from our high-risk list. Similarly, new and improved acquisition processes and oversight have contributed to FAA reporting that it has met its acquisition cost and schedule goals for the last three years. Nonetheless, making and institutionalizing further improvements in acquisition and investment management are still needed. For example, while FAA has established a cost estimating methodology for investments, it has not implemented it. In

addition, during the last two fiscal years, FAA has reported cost savings and cost avoidance of \$99.1 million and \$81.9 million, respectively. Additional work remains, though—FAA received a qualified opinion on its most recent financial audit as a result of the agency’s inability to support the accuracy and completeness of about \$4.7 billion for equipment reported in the financial statements. Moreover, as we have previously recommended, FAA should undertake additional efforts to consolidate its facilities and outsource some of its services to further cut costs. FAA’s focus on maintaining and improving its record of internal achievement will be further tested as it joins with its partners in the Joint Planning and Development Office in transitioning from planning to implementing NextGen. Some key challenges for the transition include completing the design and cost estimates for NextGen and proposing how that cost will be funded, especially in view of reduced funding for applied aeronautical research, which is necessary to achieve some critical NextGen capabilities. FAA will also need to assess if it has the necessary expertise to handle the technical and contract management that will be required to oversee the implementation of NextGen.

- Related to the challenge of modernizing the air traffic control system, FAA faces the challenge of ensuring that the nation’s 3,400 airports develop the capacity to safely and efficiently handle the projected growth in the demand for air travel. FAA estimates that the total cost for planned airport development that is eligible for funding from the Airport Improvement Program (AIP) will be about \$42 billion for 2007 through 2011. FAA administers the AIP, which provides federal funds for capital development projects at the entire range of the nation’s airports. In its fiscal year 2008 budget proposal, the Administration has proposed reducing funding for AIP grants and changing the allocation formula. Other changes being considered by FAA could increase available funds for airport development. The net effect of all these changes on the amount of funding available for planned airport development is uncertain. Additionally, the excise taxes that fund the Airport and Airway Trust Fund, such as those on ticket purchases by airline passengers and aviation fuel, are scheduled to expire at the end of fiscal year 2007. Avoiding a lapse in revenue to the trust fund in fiscal year 2008 will require Congressional action. About 80 percent of the budget request for FAA would be funded by the trust fund and the remainder by the general fund. Without a continued flow of funds to the trust fund, FAA’s ability to carry out AIP and other programs throughout the agency may be in jeopardy, compounding the safety and management challenges facing the agency.

FAA Faces Challenges in Ensuring the Safe and Efficient Operation of the Nation's Airspace System

Aviation safety is a priority goal for FAA. That priority is reflected in the Administration's budget for fiscal year 2008, which requests \$1.9 billion to promote aviation safety and efficiency. To the credit of FAA and the aviation industry, U.S. commercial aviation has had an extraordinary safety record in recent years. In 1997, FAA established a goal to reduce the commercial fatal accident rate by 80 percent in 10 years and for many years the agency has made incremental progress toward that goal. However, increased air traffic, leading to congestion and delays, is straining the efficiency and potentially the safety of the nation's airspace system. Moreover, while commercial aviation safety trends have been positive over the last several years, FAA did not meet its performance target for commercial aviation accidents last year and does not expect to meet its target for 2007. If air traffic triples as expected over the next two decades and the accident rate of recent years is unchanged, there would be nine fatal commercial aviation accidents each year, on average.

To maintain a safe and efficient airspace system, especially if substantial growth in the industry materializes, it will be important for FAA to have well-established, efficient, and effective processes in place to provide an early warning of hazards that can lead to accidents. It will also need a skilled workforce to implement these processes. FAA is moving to a system safety approach to oversight and has established risk-based, data-driven safety programs to oversee the industry and a workforce that includes approximately 4,500 safety inspectors and engineers to implement those programs, about 15,420 air traffic controllers, and nearly 7,200 technicians responsible for maintaining FAA's air traffic control equipment and facilities. In addition, FAA leverages its inspector and engineer workforce through its "designee" programs, in which about 13,400 private individuals and over 200 organizations have been delegated to act on the agency's behalf. Our recent work has identified data limitations and human resource challenges facing the agency that affect its ability to implement these programs and oversee aviation safety.

Data Limitations Affect FAA's Ability to Manage Risk

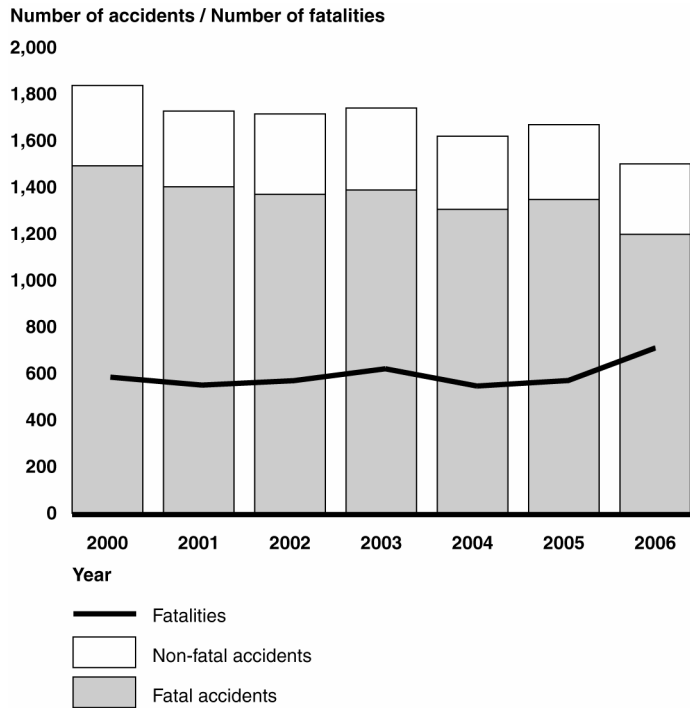
FAA's ability to identify and respond to trends and early warnings of safety problems and to manage risk is limited by incomplete and inaccurate data. While FAA has developed risk-based processes for monitoring and inspecting the aviation industry, in some cases, the implementation of those processes is hampered by the lack of reliable and complete data, which are important for identifying and mitigating safety risks. In other cases, FAA does not fully utilize the data it collects by evaluating or analyzing it for nationwide safety trends.

For example, FAA does not collect actual flight activity data for general aviation operators and air taxis. Instead, the agency uses an annual survey to query a sample of registered aircraft owners about the activity of their aircraft during the previous year. The National Transportation Safety Board³ (NTSB) noted a number of problems with these data, such as historically low response rates, and concluded that FAA's data do not accurately portray changes in general aviation activity.⁴ As a result, FAA lacks information to monitor the rate of general aviation accidents, which decreased from 1,715 in 2002 to about 1,500 in 2006. (See fig. 1.) Therefore, the agency cannot meaningfully evaluate changes in the number of general aviation accidents or determine the effect of its general aviation safety initiatives. NTSB made a number of recommendations to FAA to improve the accuracy of the survey data, such as improving the currency of aircraft owner contact information.

³NTSB, *Current Procedures for Collecting and Reporting U.S. General Aviation Accident and Activity Data* (Washington, D.C.: April 2005).

⁴In fiscal year 2007, FAA made changes to its survey, increasing the sample size from 30,000 to 75,000 and, according to the agency, responses increased from 15,000 to 32,000. However, the response rate still remains low.

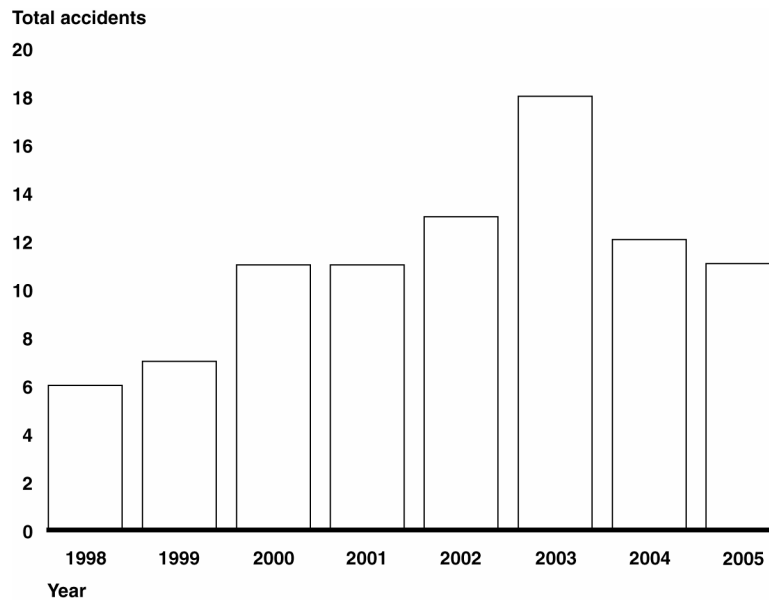
Figure 1: Number of General Aviation Accidents and Fatalities, 2000 through 2006



Source: NTSB.

As another example, FAA does not collect basic data to measure changes in the air ambulance industry, such as flight hours or number of trips flown. From 1998 through 2005, the air ambulance industry averaged 11 accidents per year, peaking at 18 accidents in 2003. (See fig. 2.) Without data about the number of flights or flight hours, FAA and the air ambulance industry are unable to identify whether the increased number of accidents has resulted in an increased accident rate, or whether it is a reflection of growth in the industry. Data describing the safety trends of the industry are essential to understanding the impact of FAA efforts to improve air ambulance safety.

Figure 2: Total Air Ambulance Accidents, 1998 to 2005



Source: GAO analysis of NTSB data.

In addition, while FAA receives important data, including self-reporting of safety violations, through its partnership programs with industry, the agency does not evaluate this information for nationwide trends. According to FAA officials, the Aviation Safety Action Program, Aviation Safety Reporting Program, and Voluntary Disclosure Reporting Program⁵ allow the agency to be aware of many more safety incidents than are discovered during inspections and surveillance. Although FAA tracks the actions taken to resolve the individual safety violations that it learns about through these programs, it does not evaluate such information in the aggregate to identify trends in violations and their potential cause in order to improve safety. We recommended that FAA develop a continuous evaluative process for its industry partnership programs, and use it to create measurable performance goals for the programs and track

⁵Participants in the Aviation Safety Action Program include employees of air carriers and repair stations; participants in the Aviation Safety Reporting Program include all users of the national airspace system, including air traffic controllers; participants in the Voluntary Disclosure Reporting Program include air carriers, repair stations, and aviation manufacturers.

performance towards those goals.⁶ FAA has not taken these actions, but has begun to address other data issues.

FAA recognizes the critical nature of the issues associated with its data. To address its data limitations, FAA is in the early stages of planning the Aviation Safety Information Analysis and Sharing system—a comprehensive new data system that is expected to provide the agency with access to a vast amount of safety data that reside with entities such as NTSB and industry partners including airlines and repair stations. Working with the National Aeronautics and Space Administration (NASA), FAA began planning for the new system in 2006. Because this activity is in the early planning stages, our concerns about FAA’s data remain relevant. The fiscal year 2008 budget for FAA proposes \$32 million for safety databases and computer systems. As FAA prioritizes the activities that it undertakes with such funds, it will be important to continue addressing these critical data limitations.

FAA Faces Workload Challenges for its Safety Inspectors

Changes to FAA’s oversight programs, such as the planned rapid expansion of the Air Transportation Oversight System (ATOS), from 16 air carriers in 2005 to approximately 115 air carriers by the end of 2007, will pose workload challenges for FAA’s safety inspector workforce of about 3,600. As FAA moves air carriers under the ATOS program, it will also move inspectors to the program. As of January 2007, the 51 air carriers in ATOS were overseen by 829 safety inspectors. Unlike other FAA inspection programs, ATOS inspectors are dedicated to an air carrier and generally cannot be used to inspect other entities. Inspectors who are not part of ATOS, on the other hand, have duties in addition to inspecting air carriers—such as overseeing repair stations, designees, and aviation schools, and investigating accidents. In prior work, we found that about 75 percent of the non-ATOS inspectors had responsibility for more than 3 entities and about half had responsibility for more than 15. In addition, we found that ATOS requires more inspectors per airline than the traditional inspection approach.⁷ As inspectors are transitioned to ATOS, the remaining inspectors will have to add those other entities to their workload. With the expansion of ATOS that will continue into fiscal year

⁶GAO, *Aviation Safety: Better Management Controls are Needed to Improve FAA’s Safety Enforcement and Compliance Efforts*, [GAO-04-646](#) (Washington, D.C.: July 6, 2004).

⁷GAO, *Aviation Safety: System Safety Approach Needs Further Integration into FAA’s Oversight of Airlines*, [GAO-05-726](#) (Washington, D.C.: Sept. 28, 2005).

2008, it will be important to monitor the magnitude of the shift in resources and the effect it may have on FAA's overall capability to oversee the industry.

Part of the challenge that FAA faces with regard to safety inspectors is improving its process for determining staffing needs. This is especially important as oversight activities and workload shifts with the expansion of ATOS and other program changes, yet FAA lacks staffing standards for safety inspectors. The National Academy of Sciences, under a congressional mandate, recently completed a study for FAA that analyzed FAA's staffing processes for safety inspectors.⁸ The study identified a number of issues that FAA must address when developing a staffing model for safety inspectors. For instance, the study included concerns that the current staffing process does not focus resources in the areas of greatest need and the match between individual inspectors' technical knowledge and the facilities and operations they oversee is not always optimal. The study recommended a process for FAA to follow to develop a staffing model and identified key factors—such as changes in aircraft and systems, changes in FAA oversight practices including a shift to a system safety approach through programs like ATOS and increasing the use of designees, and new knowledge and skill demands—that should be considered in developing the model. In response to the Academy's recommendations, FAA expects to develop a staffing model, but the agency does not have a specific timeframe for initiating this effort. With nearly \$1 billion of the fiscal year 2008 budget request for FAA covering personnel compensation and benefits for aviation safety and operations, these workload and staffing challenges are critical to address.

Hiring and Training Air Traffic Controllers Remains a Challenge

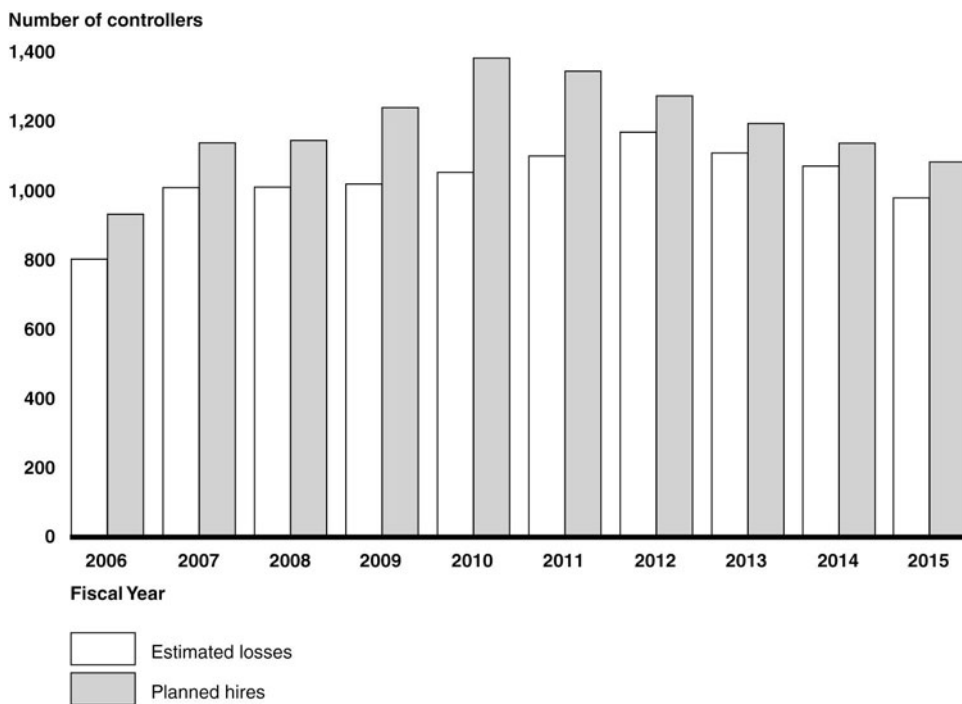
During the coming decade, FAA will need to hire and train thousands of air traffic controllers to replace those who will retire and leave for other reasons. FAA estimated it will lose 10,291 controllers, or about 70 percent of the controller workforce, during fiscal years 2006 through 2015, primarily due to retirements.⁹ To replace these controllers and

⁸National Research Council, *Staffing Standards for Aviation Safety Inspectors* (Washington, D.C.: The National Academies Press, 2006).

⁹The high percentage of retirements is attributable to the 1981 controller strike, when President Ronald Reagan fired over 10,000 air traffic controllers, and the consequent need to quickly rebuild the controller workforce. From 1982 through 1991, FAA hired an average of 2,655 controllers per year. These controllers will become eligible for retirement during the next decade.

accommodate increases in air traffic while accounting for expected productivity increases, FAA plans to hire a total of 11,800 new controllers from fiscal year 2006 through 2015. In fiscal year 2006, FAA hired 1,116 controllers. The Administration’s budget for fiscal year 2008 proposes about \$4.4 billion for salaries and benefits for the air traffic organization account, which includes FAA’s large air traffic controller workforce. The fiscal year 2008 proposal includes FAA’s plans to hire 1,420 air traffic controllers, which would bring the total number of air traffic controllers to about 15,000. Figure 3 shows the estimated losses each year as well as the number of planned hires.

Figure 3: Estimated Controller Losses and Planned Hires, Fiscal Years 2006-2015



Source: FAA.

Note: FAA established these hiring targets in its 2006 controller workforce plan.

Recent events may exacerbate the hiring situation. Data indicate that controllers are retiring at a faster rate than FAA anticipated. FAA projected 341 retirements for fiscal year 2005; 465 controllers actually retired—36 percent more than FAA’s estimate. Similarly, in fiscal year

2006, 25 percent more controllers retired than FAA projected.¹⁰ To meet its hiring target of 930 controllers in fiscal year 2006, FAA shifted about 200 of its planned hires from fiscal year 2007 to fiscal year 2006 by speeding up the initial screening and training process. According to FAA, it is on track to hire between 1,300 and 1,400 controllers in fiscal year 2007.¹¹ To keep on track, FAA has recently expanded its hiring sources, which had focused on individuals with prior FAA or Department of Defense (DOD) air traffic control experience and graduates from FAA's collegiate training initiative program, to include the general public. This strategy is needed, according to FAA officials, because DOD has recently become less of a hiring source for controllers due to military incentives for retaining controllers and higher salaries than FAA's entry-level salary.¹²

It is also important for FAA to ensure that air traffic control facilities have adequate staffing based on their unique traffic demands and the accuracy of FAA's retirement forecast. Historically, FAA has computed staffing standards, which are the number of controllers needed on a systemwide basis, but distribution of these totals to the facility level was a negotiated process. The staffing standards did not take into account the significant differences in complexity and workload among FAA's 300 terminal and enroute control facilities, which can lead to staffing imbalances. FAA has begun developing and implementing new staffing standards that use an algorithm that incorporates traffic levels and complexity of traffic at the facility level to determine the number of air traffic controllers needed, according to an FAA official. As FAA further refines its process for determining controller staffing needs, the ultimate objective is to assess the traffic level and complexity on a sector-by-sector basis to develop more accurate controller staffing requirements. This process is in the early stages of implementation and it is too early to assess the outcome. Such staffing standards for air traffic controllers as well as safety inspectors are important to ensure that FAA deploys its resources for fiscal year 2008 and later years in a cost-effective and risk-based manner.

¹⁰FAA estimated 467 retirements in fiscal year 2006 and 583 controllers actually retired.

¹¹FAA originally planned to hire 1,136 controllers in fiscal year 2007 as shown in figure 3. In January 2007, FAA revised that hiring target to 1,386.

¹²Under FAA's recent contract with air traffic controllers, most current controllers continued to receive their existing base salaries and benefits, while new controllers are hired at lower wages.

FAA Faces Challenges in Furthering and Institutionalizing Management Improvements While Moving Toward Implementing NextGen

FAA has made significant progress in implementing management processes that use leading practices of private sector businesses, but further work remains to fully address past problems. Historically, those problems included chronic cost and schedule difficulties associated with operating and modernizing the nation's air traffic control system as well as weaknesses in FAA's financial management. In 1995, we declared FAA's air traffic control modernization program a high-risk initiative because of its cost, complexity, and systemic management and acquisition problems. In 1999, we also placed FAA on the high-risk list for financial management, noting weaknesses that rendered the agency vulnerable to fraud, waste, and abuse by undermining its ability to manage operations and limiting the reliability of financial information provided to the Congress. FAA has made significant progress in both areas and we removed FAA's financial management from our high risk list in 2005. However, additional work is needed in managing its acquisitions and finances and is crucial to developing a sustainable capability for delivering priority systems on budget and on time. In addition, FAA, in partnership with other federal agencies, is embarking on the development of NextGen—one of the federal government's most complex and comprehensive undertakings in recent times. FAA faces challenges associated with moving forward from planning to implementing NextGen.

Progress Has Been Made but Further Work Remains to Institutionalize Recent Management Improvements

FAA has taken actions to operate in a more business-like manner and enable the agency to more economically and efficiently manage the \$14.1 billion requested for its fiscal year 2008 budget. Since we designated FAA financial management as high-risk in 1999, FAA has made significant improvements, including implementing a new financial management system called Delphi¹³ and developing a cost accounting system. Additionally, FAA received unqualified opinions from auditors on its annual financial statements for fiscal years 2001 through 2005, in spite of material internal control weaknesses that the auditors identified. This progress led us to remove FAA financial management from our high risk list in 2005.

Nonetheless, external auditors issued a qualified opinion on FAA's fiscal year 2006 financial statements for the first time since 2000 and repeated a material internal control weakness that was reported in 2005. The opinion

¹³Delphi is a commercial off-the-shelf financial management system that was acquired by the Department of Transportation and fully implemented in FAA in 2003.

and internal control report stemmed from FAA's inability to support the accuracy and completeness of the construction-in-progress account, reported in the financial statements as \$4.7 billion. Difficulties with this account, which includes costs for projects such as radars, runway guidance systems, and aviation safety and security systems, have been a longstanding concern. FAA has begun work to address this problem. However, it will be important for FAA to develop a systematic solution to this problem, so that it does not recur.

FAA's efforts towards improved financial management also include establishing a cost control and cost reduction program. According to agency officials, each line of business—such as FAA's Air Traffic Organization (ATO), which is responsible for managing and modernizing the air traffic control system—is annually required to propose at least one cost control initiative, and the Administrator tracks and reviews progress on these initiatives monthly. According to FAA, these initiatives have yielded a total of \$99.1 million in cost savings and \$81.9 million in cost avoidance for fiscal years 2005 and 2006. Additional cost control efforts include outsourcing flight service stations, which FAA estimates will save \$2.2 billion over 10 years, and restructuring its administrative service areas from 9 separate offices to 3, which FAA estimates will save up to \$460 million over 10 years. We have ongoing work that is assessing FAA's cost control strategy and identifying additional cost savings opportunities that may exist. For example, we have previously reported the need for FAA to pursue further cost control options, such as exploring additional opportunities for consolidating facilities and contracting out more of its services.¹⁴

FAA has taken steps to improve its software acquisition and investment management processes and for the last 3 years has reported meeting its cost and schedule targets for the acquisition of major systems, including air traffic control systems.¹⁵ These improvements are particularly important since FAA plans to spend about \$9.4 billion from fiscal year 2007 through fiscal year 2011 to upgrade and replace air traffic control systems. To better manage its information technology investments,

¹⁴GAO, *National Airspace System: Transformation will Require Cultural Change, Balanced Funding Priorities, and Use of All Available Management Tools*, [GAO-06-154](#) (Washington, D.C.: Oct. 14, 2005).

¹⁵We have on-going work examining FAA's procedures for measuring its acquisition performance.

including its software intensive air traffic control systems, and address problems we have identified,¹⁶ FAA has changed its acquisition management guidance to require review of all investments—new systems as well as systems in service. In addition, FAA has established a cost estimating methodology for its investments. FAA has also developed and applied a process improvement model to assess the maturity of its software and systems capabilities resulting in, among other things, enhanced productivity and greater ability to predict schedules and resources. Further, FAA has made progress in expanding its enterprise architecture—a comprehensive guide to its plans for acquiring new systems—to include the initial requirements for NextGen.

However, making further improvements and institutionalizing them throughout the agency will continue to be a challenge for FAA. For example, FAA’s acquisition management guidance does not clearly indicate whether the reviews of in-service systems include reevaluations of projects’ alignment with strategic goals and objectives, as we recommended. In addition, the agency has yet to implement its cost estimating methodology. Furthermore, FAA has not established a policy to require use of its process improvement model on all major acquisitions for the national air space system. Additionally, as FAA begins to detail the scope and system requirements of NextGen, it will be important to adapt and expand the enterprise architecture for the national air space system to guide these future plans. Until the agency fully addresses these residual issues, it will continue to risk program management problems affecting cost, schedule, and performance. With a multi-billion dollar acquisition budget, addressing these actions are as critical as ever.

Institutionalizing these financial, acquisition, and information technology improvements will be a challenge for FAA, especially in view of the imminent departure of the Chief Operating Officer later this month and the departure of the Administrator, who will reach the end of her 5-year term this September. We have reported that the experiences of successful transformations and change management initiatives in large public and

¹⁶ GAO, *Federal Aviation Administration: Stronger Architecture Program Needed to Guide Systems Modernization Efforts*, [GAO-05-266](#) (Washington, D.C.: Apr. 29, 2005); GAO, *Air Traffic Control: System Management Capabilities Improved, but More can be Done to Institutionalize Improvements*, [GAO-04-901](#), (Washington, D.C.: Aug. 20, 2004); and GAO, *Information Technology: FAA Has Many Investment Management Capabilities in Place, but More Oversight of Operational Systems is Needed*, [GAO-04-822](#), (Washington, D.C.: Aug. 20, 2004).

private organizations suggest that it can take 5 to 7 years or more until such initiatives are fully implemented and cultures are transformed in a sustainable manner. Such changes require focused, full-time attention from senior leadership and a dedicated team.¹⁷

Progress Continues to Be Made in Planning for NextGen, but Challenges to Successful Implementation Remain

Work to determine the capabilities and requirements that will be needed for NextGen and to produce a comprehensive vision for that system is nearing completion; however, given the staggering complexity of this ambitious effort to modernize and transform the air traffic control system over the next two decades, it will not be easy to move from planning to implementation. To plan NextGen, Congress authorized the creation of the Joint Planning and Development Office (JPDO) in 2003. JPDO is housed within FAA and the Administration's fiscal year 2008 budget includes \$14.3 million to support JPDO. To carry out its planning function, JPDO is required to operate in conjunction with multiple government agencies.¹⁸ JPDO's approach requires unprecedented collaboration and consensus among many stakeholders—federal and nonfederal—about necessary system capabilities, equipment, procedures, and regulations. Recently, JPDO has made progress in developing key planning documents, including a cost estimate for NextGen. However, as efforts move forward to implement NextGen, it will be important to identify the source and funding for completion of intermediate technology development and determine how FAA can best manage the complex implementation and integration of NextGen technologies. Without a timely transition to NextGen capabilities, JPDO officials estimate a future gap between the demand for air transportation and available capacity that could cost the U.S. economy billions of dollars annually.

¹⁷GAO-06-154.

¹⁸In addition to FAA, these agencies include the Departments of Transportation, Commerce, Defense, and Homeland Security; the National Aeronautics and Space Administration (NASA); and the White House Office of Science and Technology Policy.

JPDO Has Made Progress toward Finalizing Key Planning Documents and Developing a Cost Estimate

FAA and the other JPDO partners have been working to refine the vision for NextGen and achieve a general consensus on that vision. The bulk of JPDO's planning has been to develop three critical documents—a concept of operations,¹⁹ enterprise architecture,²⁰ and operational improvement roadmaps.²¹ Once these key documents are completed in the next few months, it will be important to synchronize them with partner agency planning documents, including FAA's implementation plan for NextGen—the Operational Evolution Partnership (OEP)—and to continue to use the documents to drive agency budget decisions. The OEP is intended as a comprehensive description of how the agency will implement NextGen, including the required technologies, procedures, and resources. JPDO is continuing to work with the Office of Management and Budget (OMB) to develop a unified, cross-agency program for NextGen funding requests.

Given the criticality of NextGen, another important planning document—possibly the most important for Congress—is a comprehensive estimate of the costs to JPDO partner agencies, particularly FAA, for the required research, development, systems acquisitions, and systems integration. Such an estimate does not yet exist. As we reported in November 2006,²² a limited, preliminary cost estimate concluded that FAA's budget under a NextGen scenario would average about \$15 billion per year through 2025, or about \$1 billion more annually (in today's dollars) than FAA's fiscal year 2006 appropriation.²³ A JPDO official told us they have submitted a

¹⁹The concept of operations describes how the transformational elements of NextGen will operate in 2025. It is intended to establish general stakeholder buy-in to the NextGen end state, transition path, and business case.

²⁰The enterprise architecture follows from the concept of operations and describes the system in more detail (using federal enterprise architecture and DOD enterprise architecture frameworks). It will be used to integrate planning efforts and drive partner agency guidance.

²¹The operational improvement roadmaps lay out a timeline for deploying and integrating NextGen systems.

²²GAO, *Next Generation Air Transportation System: Progress and Challenges Associated with the Transformation of the National Airspace System*, GAO-07-25 (Washington, D.C.: Nov. 13, 2006).

²³This preliminary estimate—developed by the Research, Engineering and Development Advisory Committee, an advisory committee to FAA—indicates that the cost for a status quo scenario (i.e., no NextGen) would also be about \$15 billion per year through 2025. This is due primarily to the expectation that, under the NextGen scenario, capital expenditures would be higher than under the status quo scenario in the near term, but operations costs would be lower because of productivity improvements in the longer term.

limited NextGen cost estimate to OMB with the 2008 budget request. As of February 9, 2007, JPDO had not publicly released its cost estimate for NextGen. According to the Department of Transportation, the Administration's budget for fiscal year 2008 includes \$175 million to support key FAA investments in NextGen.

According to JPDO officials, their current estimate focuses only on the near-term capital needs for FAA's ATO portfolio. To develop what they believed would be a more accurate cost estimate, JPDO also focused on the funding necessary to achieve only the capabilities of the NextGen system around 2016, rather than the long-term 2025 capabilities. JPDO then laid out the major systems and investments required by ATO to achieve the mid-term vision and the related costs for ATO.

While JPDO's new estimate will be a step toward understanding the costs of NextGen, this estimate is still incomplete. Much work remains to develop a comprehensive cost estimate for NextGen that includes the costs to the rest of FAA (beyond ATO), the other JPDO partner agencies, and industry. A JPDO official told us the agency is working to develop a comprehensive estimate and plans to have one ready to submit with the 2009 budget request. This comprehensive estimate is intended to describe the business case for NextGen and detail the investments that will be required by all the JPDO partner agencies to achieve the NextGen vision by 2025.

Both JPDO and FAA Face Challenges as NextGen Moves from Planning to Implementation

The successful implementation of NextGen will depend, in part, on resolving the uncertainty over which entities will fund and conduct the research and development necessary to achieve some key NextGen capabilities and to support the operational roadmaps. In the past, a significant portion of aeronautics research and development, including intermediate technology development, has been performed by NASA. However, our analysis of NASA's aeronautics research budget and proposed funding shows a 30 percent decline, in constant 2005 dollars, from fiscal year 2005 to fiscal year 2011. To its credit, NASA plans to focus its research on the needs of NextGen. However, NASA is also moving toward a focus on fundamental research and away from developmental work and demonstration projects. FAA has determined that research gaps now exist as a result of both NASA's cuts to aeronautical research funding and the expanded requirements for NextGen coming from JPDO. These gaps are in the activities of applied research and development—activities that will be required to implement new policies, demonstrate new capabilities, set parameters for certification of new systems, and develop technologies for transfer to industry.

It will be important for both FAA and JPDO to find ways, in the near term, to keep the necessary research and development on track to support implementation of NextGen by 2025. In 2006, officials from FAA and JPDO initiated an assessment of NextGen research and development requirements. Their goal was to identify specific research initiatives that were not currently funded, but which they said must be initiated no later than fiscal year 2009 to comply with the operational roadmaps. The preliminary findings from this assessment led to increased budget requests for FAA to help lessen the research and development gaps. However, JPDO officials noted that a research and development gap remains, with items in the research and development pipeline that need funding to take them from concept to development. Other options for addressing the gap are for JPDO and FAA to further explore ways to leverage the research being conducted in other agencies or to partner with industry or academia. For example, JPDO and FAA have already identified research within DOD on alternative fuels that, with a modest investment, could be leveraged to include civil aviation. Currently, it is unknown how all of the significant research and development activities inherent in the transition to NextGen will be conducted or funded.

Another issue with regard to NextGen implementation will be FAA's ability to manage the systems acquisitions and integration needed to implement a system as broad and complex as NextGen. In the past, a lack of expertise contributed to weaknesses in FAA's management of air traffic control modernization efforts. Industry experts with whom we have spoken continue to question whether FAA will have the technical expertise needed to implement NextGen. In November, we recommended that FAA examine its strengths and weaknesses with regard to the technical expertise and contract management expertise that will be required to define, implement, and integrate the numerous complex programs inherent in the transition to NextGen.²⁴ In response to our recommendation, FAA is considering convening a blue ribbon panel to study this issue and make recommendations to the agency about how to best proceed with its management and oversight of the implementation of NextGen. We believe that such a panel could help FAA begin to address this challenge.

²⁴[GAO-07-25](#).

Funding Issues May Affect Airports' Investment and Other FAA Programs

As it modernizes the national airspace system to meet the nation's future air transportation needs, FAA must not only transform the air traffic control system, but also work with airport operators to provide increased capacity at airports to safely handle the projected growth in the demand for air travel. This latter responsibility will include overseeing airports' efforts to adapt their infrastructure to accommodate the introduction of very light jets, and in the case of the largest airports, the new large Airbus A380. Airports are an integral part of the nation's transportation system and maintaining their safety and efficiency is an important FAA responsibility. To this end, FAA administers the Airport Improvement Program (AIP), which provides federal funds for development projects at the entire range of the nation's 3,400 airports—from small general aviation airports to the very largest that handle several million passengers per year. The Administration has proposed cuts in AIP funding and is considering possible changes to the AIP allocation formula as well as increasing the cap on passenger facility charges²⁵ for airport development projects. Any change in the level or allocation of these funds could have implications for funding airport capital projects. Not only AIP grants but also portions of other FAA programs receive funds from the Airport and Airway Trust Fund, which is largely financed by excise taxes on ticket purchases by airline passengers and aviation fuel. Since these taxes are scheduled to expire at the end of September 2007, ensuring that there is no lapse in revenue to the trust fund will require Congressional action.²⁶ Without a continued flow of funds to the trust fund, FAA's ability to carry out AIP and other programs during fiscal year 2008 may be in jeopardy.

FAA's Recent Estimate of Planned Capital Development Similar to Past Estimate

FAA estimates the total cost for planned airport projects that are eligible for AIP funding, including runways, taxiways, and noise mitigation and reduction efforts, will be about \$42 billion for fiscal years 2007 through 2011.²⁷ This estimate is little changed from the agency's last estimate in 2004 for the period 2005 to 2009. FAA's current estimate indicates that over half of the planned development will occur at large and medium hub

²⁵Passenger facility charges are fees airports can charge passengers to fund FAA approved projects.

²⁶Congress also would need to renew FAA's authority to spend from the trust fund.

²⁷FAA's estimate, in nominal dollars, is based on the agency's National Plan of Integrated Airport Systems, which FAA published in September 2006.

airports.²⁸ The Airports Council International—North America (ACI-NA) also provides estimates of planned airport development. ACI-NA includes both AIP-eligible projects and ineligible projects and, as a result, has higher estimates.

Historically, airports have received funding for capital development from a variety of sources. As we reported in 2003, the single largest source of financing for airports is tax-exempt bonds, followed by AIP grants and passenger facility charges. Tax exempt bonds are currently supported by airport revenue and, in some cases, by passenger facility charges. Access to these funding sources varies according to airports' size and funding capabilities. Large and medium hub airports depend primarily on tax-exempt bonds, while the smaller airports rely principally on AIP grants.²⁹ Passenger facility charges are a particularly important source of capital for large and medium hub airports because they have the majority of commercial service passengers.

FAA Funding Proposals Would Change How Airport Development is Financed

The Administration has proposed changing the federal role in financing airport development in its fiscal year 2008 budget proposal, which also includes a reauthorization proposal for FAA that will be submitted later this month. Funding for AIP grants would be reduced and the allocation formula changed. The Administration's reauthorization proposal is expected to provide details on these proposed changes. It is, therefore, currently unclear how a number of issues will be addressed.

The reauthorization proposal may clarify the impact on smaller airports,³⁰ which received about two-thirds of AIP grants in fiscal year 2004. As noted earlier in my statement, smaller airports rely primarily on AIP grants for capital funding. In recent years, statutory changes in the distribution of

²⁸Commercial service airports are categorized by the number of enplanements. Large hubs are those airports that account for at least one percent of total passenger enplanements. Medium hubs account for between 0.25 and 1 percent of total passenger enplanements.

²⁹Any increase in the issuance of bonds exempt from federal taxation has an impact on federal revenue.

³⁰Smaller airports include small hub, nonhub, other commercial service, reliever (high capacity general aviation airports in major metropolitan areas that provide pilots with an alternative to using congested hub airports) and general aviation airports.

AIP grants have increased the share to smaller airports.³¹ However, under the fiscal year 2008 budget proposal, funding changes would especially impact smaller airports if the current allocation formulas are unchanged in the forthcoming reauthorization proposal. First, primary airport entitlements³² under AIP would be cut in half from the fiscal year 2006 level. In turn, the small airport fund, which is funded from AIP entitlement amounts that large and medium hub airports must turn back if they impose passenger facility charges,³³ would also be reduced by half. Second, state entitlements for non-primary³⁴ commercial service and general aviation airports would be reduced from 20 percent to 18.5 percent of total AIP obligations. Finally, discretionary set aside grants for reliever airports would be eliminated under the fiscal year 2008 budget proposal. Table 1 shows the effect on the amounts available for various types of AIP grants at different funding levels including the \$2.75 billion requested in the Administration's budget and the actual funding level for fiscal year 2006.

³¹For example, FAA's 2000 authorization (Pub. L. No. 106-181) boosted funding for nonprimary airports and small primary airports by increasing the portion of AIP passenger entitlement funds that must be turned back by large and medium hub airports. Under AIP, airports that collect passenger facility charges must forfeit a certain percentage of their AIP entitlement funds, which are then distributed to smaller airports. In fiscal year 2004, smaller airports received a total of about \$380 million as a result of these turn backs.

³²Entitlements are AIP funds apportioned to airport sponsors and states for eligible projects based on formulas.

³³Small airport fund grants must be spent at small hub primary airports, general aviation airports (including reliever airports), and nonhub commercial airports.

³⁴Non-primary airports are commercial service airports that have from 2,500 to 10,000 annual passenger enplanements. These airports are used mainly by general aviation.

Table 1: Estimated AIP Distribution Under Alternative Funding Levels (in millions)

	Alternative funding levels			
	\$2,750 (proposed FY 2008)	\$3,000	\$3,250	\$3,550 (actual FY 2006)
Primary airports entitlements	\$496.0	\$496.0	\$857.7	\$888.0
Entitlements for non-primary, general aviation and reliever airports	487.9	534.1	242.0	299.5
Other entitlements ^a	103.0	111.8	516.5	526.6
Carryover entitlements ^b	447.8	447.8	447.8	431.7
Small airport fund	214.2	214.2	428.4	428.4
Discretionary set aside grants for reliever airports	0.0	0.0	4.3	5.6
All other discretionary and set aside grants ^c	888.3	1,083.3	640.4	844.6
TOTAL AIP funds available for grants^d	\$2,637.2	\$2,887.2	\$3,137.1	\$3,424.4

Source: FAA.

^aIncludes grants for Alaskan airports and cargo service airports.

^bFunds that some airports can claim to use in the fiscal year in which the amount was apportioned and two fiscal years immediately after that year.

^cFunds that are available for use on AIP eligible projects at FAA's discretion. This includes funds set aside for such things as noise planning and programming, reliever airports and capacity, safety, security, and noise projects. It also includes discretionary grants that can be used for any AIP eligible project at any airport.

^dThe funding available for grants after the 2006 rescission and deductions for airport research, other programs, and administrative costs.

To help offset any reductions in AIP grants, FAA is also considering allowing airports to collect more revenue from passenger facility charges, which large airports generally prefer. Airlines, however, have been generally opposed to an increase in these charges because they have little control in how passenger facility charges are spent and because they believe these charges reduce passenger demand for air travel. Nonetheless, if airports were to increase charges, additional airport revenue could be generated. Increasing the cap on passenger facilities charges would primarily benefit larger airports because these charges are a function of passenger traffic. However, as already noted, under AIP, large airports that collect passenger facility charges must forfeit a certain percentage of their AIP formula funds. These forfeited funds are subsequently divided between the small airport fund, which is to receive 87.5 percent, and the discretionary fund, which is to receive 12.5 percent. Thus, under current law, smaller airports would benefit indirectly from any increases in passenger facility charges and help offset reductions in AIP funding.

FAA and the Congress Will Face a Challenge Funding FAA Programs in Fiscal Year 2008 if Reauthorization is Not Timely

With the excise taxes that fund the Airport and Airway Trust Fund scheduled to expire at the end of fiscal year 2007, Congress will need to act if there is to be no lapse in revenue to the trust fund to fund FAA. If the taxes are neither reauthorized by that time nor replaced by other revenue sources for the trust fund, the only revenues to the trust fund will be interest earned on the fund's cash balance. FAA estimates that two previous lapses in 1996-1997 resulted in the trust fund not receiving about \$5 billion in revenue.

As of the end of fiscal year 2006, the trust fund's uncommitted balance—surplus revenues in the trust fund against which no commitments, in the form of budget authority, have been made—was less than \$2 billion. The Administration's budget proposal projects that the uncommitted balance will be about \$2 billion at the end of fiscal year 2007. If today's level of monthly tax revenue continues, a 2- to 3-month lapse in fiscal year 2008 could reduce the revenue to the trust fund enough to cause the uncommitted balance to fall to zero in fiscal year 2008. Most of FAA's funding comes from the trust fund—the fiscal year 2008 budget request for FAA proposes about 80 percent of the agency's funding from the trust fund with the remainder from the general fund. If the trust fund balance falls to zero, continuation of FAA's programs—including efforts to address some of the safety and management challenges that I have discussed—would depend on providing additional general revenues.

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