**Before the Committee on Transportation and Infrastructure**
**Subcommittee on Aviation**
**United States House of Representatives**

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# Key Issues for Reauthorizing the Federal Aviation Administration

**Statement of**
**The Honorable Calvin L. Scovel III**
**Inspector General**
**U.S. Department of Transportation**

Chairman Costello, Ranking Member Petri, and Members of the Subcommittee:

We appreciate the opportunity to discuss the key issues facing the Federal Aviation Administration (FAA) and the aviation community. As with most major industries, U.S. civil aviation is facing uncertainty amidst the current economic crisis. The National Airspace System is an integral part of the Nation's economy and handles almost 50,000 flights per day and more than 700 million passengers annually. Aviation contributed over $1.2 trillion to the Nation's economy in 2006.

As the Subcommittee is aware, FAA does not have a long-term authorization or funding mechanism in place and has been operating on a short-term extension since September. The current extension expires in March 2009. However, the aviation environment has changed significantly since Congress last debated proposals for reauthorizing and financing FAA.

U.S. airlines have been buffeted by the softening economy and volatile fuel costs. As a result, carriers have taken a considerable amount of capacity out of the system, although load factors remain high. By November 2008, airlines cut back scheduled domestic flights and available seat miles by 13 percent and grounded approximately 360 aircraft (mostly the less fuel efficient models in their fleets), which resulted in 37,000 airline employees losing their jobs.

Airports have been impacted as well, particularly in terms of service to small communities, with some losing commercial service entirely. In the case of large airports, there are concerns that some may delay infrastructure projects as revenue sources continue to decline.

The decline in traffic has also impacted the Aviation Trust Fund, the largest source of revenue for FAA's $15 billion annual budget. According to Treasury Department data, Trust Fund revenues have declined by more than 11 percent during the first quarter of fiscal year (FY) 2009. Given the drop in traffic and the resulting decline in passenger taxes, it is almost certain that future Trust Fund tax revenues will decrease significantly during the balance of FY 2009 and in FY 2010 as well.

Notwithstanding the uncertainties facing the industry, this situation provides FAA with opportunities to focus on key challenges it must address to be strategically positioned for an industry rebound. We see four overarching areas that need to be at the center of FAA's efforts over the next several years: (1) maintaining public confidence in FAA's ability to provide oversight of a dynamic industry, (2) setting expectations and budget priorities for NextGen, (3) bolstering key safety workforces, and (4) financing future airport development while facing unstable long-term airport funding mechanisms.

## Maintaining Public Confidence in FAA's Ability To Provide Oversight of a Dynamic Industry

Over the last several years, the aviation industry has experienced the safest period in history. This is due, in part, to the dedicated efforts of the professionals within FAA and throughout the aviation industry. Last month, we saw a dramatic example of aviation professionalism when U.S. Airways flight 1549 made an emergency landing in the Hudson River, and, miraculously, all 155 passengers and crew survived largely because of the skills of the pilot and crew. Nevertheless, airline consolidation and downsizing continue to drastically change the industry, and widely publicized lapses in FAA oversight in 2008 emphasize the need for FAA to continually adapt its oversight to further enhance safety. Key challenges for FAA include:

- **Maintaining public confidence in FAA's oversight of air carrier operations.** In April 2008, we reported that an FAA safety inspector had an overly collaborative relationship with Southwest Airlines. The inspector violated FAA safety directives by permitting the air carrier to operate 46 planes without required inspections for fuselage cracks. Our work at Southwest and other carriers has also found weaknesses in FAA's national program for risk-based oversight, the Air Transportation Oversight System (ATOS). At Southwest, multiple missed ATOS inspections allowed safety directive compliance issues in Southwest's maintenance program to go undetected for several years. Our current review of ATOS has disclosed that this problem was not limited to SWA—FAA oversight offices for seven other major air carriers also missed ATOS inspections. FAA needs to bolster the integrity of its airline oversight by protecting whistleblowers, improving risk-based systems for targeting inspector resources, and establishing mechanisms at the national level to provide quality assurance and independent assessments of field office inspection efforts.

- **Following through on longstanding commitments to improve oversight of external repair facilities.** FAA continues to face challenges in identifying where critical aircraft maintenance[1] is performed. A key issue is that FAA's risk-based oversight system does not include critical repairs performed by non-certificated repair facilities. Currently, FAA does not require that air carriers report *all* repair stations performing repairs to critical components or that FAA inspectors validate voluntarily submitted information. FAA needs to advance risk-based oversight of outsourced maintenance providers (both foreign and domestic) by developing and implementing a system for determining how much and where aircraft maintenance is performed.

- **Improving runway safety.** Runway incidents continue to be a substantial threat to safety. The December 2008 accident at Denver International, when a

[1] "Critical maintenance" describes mandatory maintenance activities that, due to their importance to the overall airworthiness of the aircraft, must be independently inspected by a specially trained inspector after the work is complete.

Continental 737 veered off the runway into an adjacent field during take-off and caught fire, underscores the seriousness of these incidents. Many see new technology as a key runway safety solution. However, our reviews of three major FAA technologies for improving runway safety disclosed serious concerns about what can be effectively deployed within the next several years. Key steps to meeting this challenge include implementing airport-specific infrastructure and procedural changes and reinvigorating existing FAA national programs for improving runway safety.

## Setting Expectations and Budget Priorities for NextGen

Developing the Next Generation Air Transportation System (NextGen) is a high-risk effort involving billion-dollar investments from both the Government and industry. After more than 4 years of planning, FAA must shift to implementation. To reduce risk, we recommended last April[2] that FAA conduct a "gap analysis" of the current system and the vastly different NextGen system planned for 2025 and develop an interim architecture. FAA has focused considerable attention on mid-term objectives, but fundamental issues need to be addressed. These include the following:

- **Completing the gap analysis of today's system and NextGen as promised and refining the NextGen mid-term architecture.** These two efforts are important because FAA intends to rely on existing automation systems to provide the basis for NextGen through the mid term. However, until FAA establishes the detailed changes needed to transition to NextGen, it will be impossible to determine requirements that can be used to develop reliable cost and schedule estimates to achieve NextGen's mid-term goals.

- **Establishing priorities and Agency commitments with stakeholders and reflecting them in budget requests and plans.** It remains difficult for decision makers to determine what to invest in first from the wide range of operational improvements in NextGen planning documents. Also, stakeholders have asked FAA to clearly state mid-term Agency and operator commitments in its NextGen plans.

- **Managing NextGen initiatives as portfolios and establishing clear lines of responsibility, authority, and accountability.** It is important to manage NextGen capabilities in an integrated way because new systems as well as procedure and airspace changes will be needed to deliver benefits. However, FAA's Acquisition Management System was not designed for managing NextGen investments. Rather, FAA's system focuses on baselines and specific capital programs—not a collection of investments. FAA recognizes that it must adjust its process for approving acquisitions. FAA could also strengthen its NextGen

[2] OIG Report Number AV-2008-049, "Air Traffic Control Modernization," April 14, 2008. OIG reports and testimonies are available on our website: www.oig.dot.gov.

Implementation Plan by assigning responsibility, authority, and accountability for specific NextGen portfolios.

- **Identifying the number and type of facilities that will be needed to support NextGen.** FAA has not made key decisions regarding facility consolidations and infrastructure needs—a key cost driver for NextGen. FAA plans to spend $17 million in FY 2009 to examine various alternatives for revamping its facilities. The realignment or consolidation of FAA facilities is a controversial undertaking. Therefore, FAA must ensure that this analysis clearly addresses the technological and security prerequisites, cost drivers, benefits, and logistical concerns associated with consolidation so decision makers will know what can be reasonably accomplished.

## Bolstering Key Safety Workforces

FAA continues to face significant attrition in two of its most critical safety workforces: air traffic controllers and aviation safety inspectors. Over the next decade, FAA must maintain enough professionals with the right skill mix in both of these workforces to ensure the safe and efficient operations of the National Airspace System. Key challenges for FAA include the following:

- **Hiring and training the next generation of air traffic controllers.** Through 2017, FAA plans to hire and train nearly 17,000 new controllers to replace those who were hired after the 1981 strike and are now retiring. A major challenge will be training and certifying the huge surge of new controllers at their assigned location, a process that currently takes up to 3 years. Controllers in training now represent nearly 26 percent of the workforce (up from 15 percent in 2004). However, many key facilities, such as the Southern California Terminal Radar Approach Control, or TRACON (which expects to have nearly 100 controllers in training later this year or over 40 percent of its workforce), already exceed the national levels. Ensuring there are enough certified controllers at FAA's more than 300 air traffic control facilities will remain a significant watch item for the Department and Congress for at least the next 10 years.

- **Addressing controller human factor issues.** As attrition increases, FAA must also continue addressing controller human factor issues such as fatigue and attention. Congress has expressed concerns regarding controller human factor issues because the influx of new controllers will need both technical and human factors training. Human factors training is critical since almost 90 percent of controller operational errors (when a controller allows two aircraft to get too close together either on the runway or in the air) are due to human factors issues rather than procedural or equipment deficiencies. Based on our ongoing work, FAA needs to focus on training controllers about fatigue and revising its policies on controller rotational shift schedules and rest requirements.

- **Ensuring a sufficient number of appropriately placed safety inspectors to address a divergent aviation environment.** It is not reasonable to expect FAA to have an inspector workforce large enough to oversee all aspects of a dynamic aviation industry; therefore, it is critical that FAA ensure its inspectors are placed where they are most needed. In a congressionally directed 2006 study, the National Research Council concluded that FAA's current methodology for allocating inspector resources was not effective and recommended that FAA develop a new approach. FAA has initiated work on a new model, but it is not planned for completion until October 2009. Given the nature of the industry, measurable progress on developing a new staffing model over the next year remains an important watch item.

## Financing Future Airport Development While Facing Unstable Long-Term Airport Funding Mechanisms

FAA estimates[3] that nearly $50 billion will be needed for future airport development from FY 2009 to FY 2013. This exceeds the previous peak set in 2001 by more than 7 percent ($49.7 billion versus $46.2 billion). Airport development relies on several funding mechanisms. These include FAA assistance through grants-in-aid under its Airport Improvement Program (AIP); passenger facility charges (PFC); bonds; and self-generated revenues from airlines, parking, and concessions.

However, volatile fuel prices and a softening economy have led to airline service reductions and capacity cuts, which have caused passenger traffic to decline. This in turn has led to uncertainty with long-term airport funding mechanisms, which could inhibit future airport development. Specifically:

- When airports experience reductions in passenger traffic, PFC collections[4] automatically decline. PFCs are a source of funding that airports largely depend on to finance capital improvement projects that are usually ineligible to receive AIP funds (such as airport terminal improvements).

- The unstable financial markets have made it difficult for airports to issue bonds. Consequently, airports are being forced to either postpone key development projects or find other sources of short-term financing as an interim fix to keep projects moving.

Airports are taking measures to offset these decreases in revenue. These measures include requesting higher levels of AIP discretionary funding for planned capital improvement projects. Because Vision 100[5] expired at the end of FY 2007, and a

[3] Federal Aviation Administration, Report to Congress, "National Plan of Integrated Airport Systems," 2009-2013.
[4] PFCs are currently capped at $4.50 per passenger enplanement (i.e., passenger boarding).
[5] Vision 100 – Century of Aviation Reauthorization Act, Pub. L. No. 108-176 (2003).

long-term reauthorization is not yet in place, there are no funding targets for FY 2010 and beyond.

The Consolidated Security, Disaster Assistance, and Continuing Appropriations Act,[6] which funded FAA in FY 2009, provided a short-term appropriation of $1.5 billion for the AIP account but did not extend the AIP contract or obligation authority to issue new AIP grants beyond March 6, 2009. The uncertainty of future AIP grant authority makes it difficult for the Nation's airports to determine when or if they will receive their AIP grants.

The economic stimulus packages proposed in the House and Senate contain significant funding amounts for the AIP that will help to revitalize airport development this year and next year. However, such a large, rapid infusion of new funds could create significant oversight challenges for FAA. For example, there will be pressure to begin projects quickly, and FAA and the Department will have to balance this pressure against the need to continually emphasize safety. It is critical that FAA prepare for the potential risks involved and ensure steps are underway to mitigate them.

Mr. Chairman, as part of our recently announced Department-wide review of oversight challenges associated with economic stimulus funding for transportation projects, I can assure you that my office will be working with the Department to identify risks, oversight challenges, and best practices associated with the stimulus funding for the AIP.

I would now like to discuss in further detail the state of the aviation industry and FAA's budget and financing challenges as they relate to these four areas.

[6] Pub L. No. 110-329 (2008).

# PERSPECTIVES ON THE STATE OF THE AVIATION INDUSTRY, FAA'S BUDGET, AND FINANCING MECHANISMS

Since FAA submitted its reauthorization proposal in 2007, the aviation environment has changed significantly. The current economic downturn following record-high fuel prices has caused air carriers to dramatically scale back operations. This trend is also affecting the Airport and Airway Trust Fund, the main funding mechanism for FAA programs.

- In response to last year's increased fuel prices, airlines took drastic measures to reduce costs. By November 2008, airlines cut back scheduled domestic flights and available seat miles by 13 percent and grounded approximately 360 aircraft (mostly the less fuel efficient models in their fleets), which resulted in 37,000 airline employees losing their jobs.

- Airline cutbacks hit airports of all sizes and brought the number of flights to the lowest levels in 6 years. Comparing November 2007 with November 2008, we found scheduled domestic flights in November 2008 were down approximately 10 percent for the large-hub airports, 16 percent for medium-hub airports, 14 percent for small-hub airports, and 14 percent for non-hub airports.[7]

- Airline reductions in capacity also helped reduce delays within the system. While 2007 trends in flight delays continued into the first half of 2008—with more than 1 in 4 flights delayed or cancelled—system-wide flight delays declined by 24 percent in the second half of 2008 as airlines initiated capacity cutbacks and schedule changes. However, high levels of delay continued at major airports such as Newark, Kennedy, Atlanta, and Miami.

## Observations on FAA's Budget

Over the past 3 years, FAA's annual budget has totaled between $14.5 billion and $15 billion. Approximately 59 percent of this funding has been allocated to the Operations account, 18 percent to the Facilities and Equipment account, 22 percent to the Airport Improvement Program, and 1 percent to the Research, Engineering, and Development account (see table 1 below). FAA does not plan to submit its 2010 budget until April.

[7] Based on FAA classification of airports, non-hub airports enplane fewer than 0.05 percent of system-wide passengers, small-hub airports enplane more than 0.05 percent but fewer than 0.25 percent of system-wide passengers, medium-hub airports enplane more than 0.25 but fewer than 1 percent of system-wide passengers, and large-hub airports enplane more than 1 percent of system-wide passengers.

***Table 1. FAA Budget, FY 2007 Through FY 2009 ($ in Millions)***

| Account | FY 2007 Actual | FY 2008 Enacted* | FY 2009 Request |
|---|---|---|---|
| Operations | $8,374 | $8,740 | $8,998 |
| Facilities & Equipment | $2,518 | $2,514 | $2,724 |
| Airport Improvement Program | $3,515 | $3,515 | $2,750 |
| Research, Engineering, and Development | $130 | $147 | $171 |
| **Total** | **$14,537** | **$14,915** | **$14,643** |

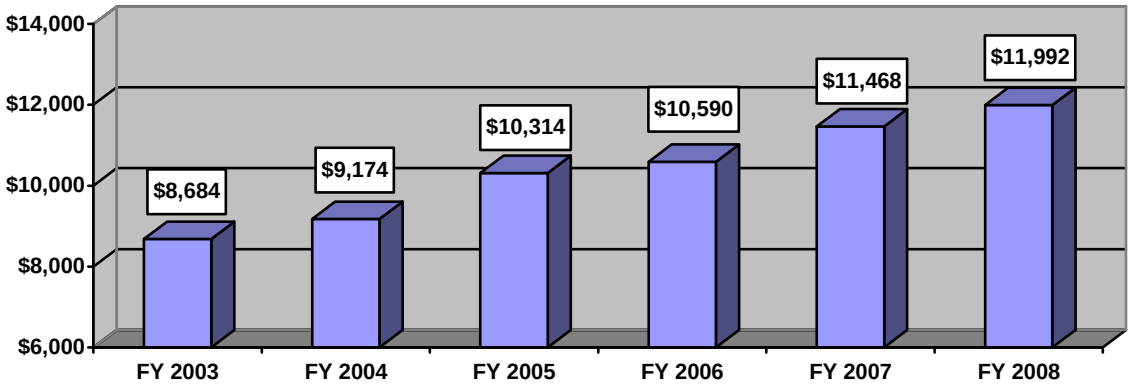
Source: FAA's FY 2009 Budget Request
* Figures may not add up due to rounding.

FAA is currently financed by two mechanisms: excise taxes deposited into the Airport and Airway Trust Fund and a General Fund contribution. Over the past 5 years, the Trust Fund has paid for approximately 81 percent of FAA's total budget with the remaining 19 percent paid out of the General Fund.

## Observations on the State of the Aviation Trust Fund

The current economic slowdown and airline capacity cuts have resulted in declining Trust Fund revenues. According to Treasury Department data, Trust Fund revenues declined by more than 11 percent during the first quarter of FY 2009. Over the past 5 years, Trust Fund tax revenues have steadily increased (see figure 1). However, given the drop in traffic and the resulting decline in passenger taxes, it is almost certain that future Trust Fund tax revenues will drop significantly during the balance of FY 2009 and in FY 2010 as well.

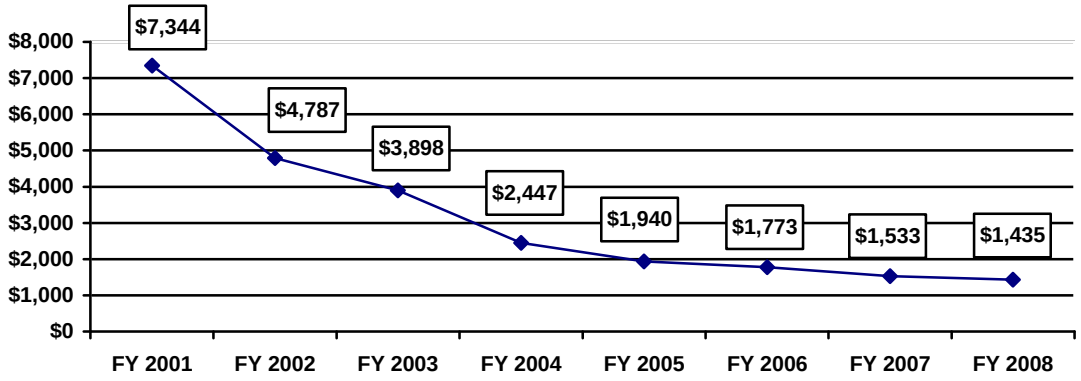
***Figure 1. Airport and Airway Trust Fund Tax Revenues FY 2003 to FY 2010 ($ in Millions)***




In addition, past differences between FAA's budget and the Trust Fund revenues and General Fund contribution have been made up by drawing down the Trust Fund's

uncommitted balance. However, these actions have depleted that balance to the point where only a limited cushion of funding remains. As shown in figure 2 below, the uncommitted Trust Fund balance has declined by more than 80 percent, from $7.3 billion at the end of FY 2001 to $1.4 billion at the end of FY 2008. As a result, this practice may no longer be a viable option for funding new and existing projects.

***Figure 2. Airport and Airway Trust Fund Uncommitted Balance FY 2001 to FY 2008 ($ in Millions)***




As Congress moves forward with FAA's annual appropriations and multi-year reauthorization legislation, it should monitor the status of the Trust Fund to ensure its long-term solvency while ensuring sufficient funding for Agency programs.

## ENHANCING AVIATION SAFETY AND MAINTAINING PUBLIC CONFIDENCE IN FAA'S ABILITY TO PROVIDE EFFECTIVE OVERSIGHT OF A RAPIDLY CHANGING INDUSTRY

Over the last several years, the aviation industry has experienced the safest period in history. This is due, in part, to the dedicated efforts of the professionals within FAA and throughout the aviation industry. Last month, we saw a dramatic example of aviation professionalism when U.S. Airways flight 1549 made an emergency landing in the Hudson River, and, miraculously, all 155 passengers and crew survived largely because of the skills of the pilot and crew. Nevertheless, airline consolidation and downsizing continue to dramatically change the industry, and widely publicized lapses in FAA oversight in 2008 emphasize the need for FAA to continually adapt its oversight to further enhance safety. Key challenges for FAA include the following:

- Maintaining public confidence in FAA's oversight of air carriers and manufacturers.
- Following through on longstanding commitments to improve oversight of external repair facilities.
- Improving runway safety.

## Maintaining Public Confidence in FAA's Oversight of Air Carriers and Manufacturers

A significant challenge for FAA will be to maintain public confidence in its oversight of air carrier operations. Our congressional testimonies in April 2008[8] before the House of Representatives and the Senate disclosed serious lapses in FAA's oversight at Southwest Airlines (SWA). We reported that an FAA safety inspector had an overly collaborative relationship with SWA and had violated FAA safety directives by permitting the air carrier to operate 46 planes without required inspections for fuselage cracks. FAA's actions in this instance appeared to focus primarily on promoting aviation over safety, which diminishes the public perception of FAA's ability to provide objective oversight.

In response to the safety lapses at SWA, on May 1, 2008, the Secretary of Transportation commissioned a panel to examine FAA's safety culture and its approach to safety management. In its final report, issued in September, the panel disclosed that it found FAA's safety staff was "unambiguously committed" to its safety mission but acknowledged that a remarkable degree of variation in regulatory philosophies exists among inspectors, which could create widespread inconsistencies in regulatory decision making.

The panel also determined that data from air carrier self-disclosures, such as the safety directive self-disclosure used in the SWA incident, were not routinely analyzed at a higher level within FAA. In our ongoing review of ATOS, we have found that self-disclosure data are neither analyzed at a higher level within FAA nor analyzed and used by FAA field offices to assess risks within air carrier maintenance programs.

We also found this to be true of another voluntary reporting program, called the Aviation Safety Action Program, in which aviation employees self-report possible regulatory violations. FAA collects summary information on the number of reports submitted but has overlooked an opportunity to enhance the national margin of safety because it does not collect and analyze the actual data on a national level to identify potentially systemic safety issues. Both of these voluntary reporting programs have the potential to provide valuable safety data, but FAA is not realizing their full benefits. We plan to issue the results of our review of the Aviation Safety Action Program later this year.

After the SWA incident, we conducted further reviews of safety directive compliance. Early indications show this problem is occurring at other carriers as well.

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[8] OIG Testimony Number CC-2008-046, "Actions Needed To Strengthen FAA's Safety Oversight and Use of Partnership Programs," April 3, 2008. OIG Testimony Number CC-2008-067, "Key Safety Challenges Facing the FAA," April 10, 2008. OIG Testimony Number CC-2008-070, "Key Safety and Modernization Challenges Facing the FAA," April 17, 2008.

Our review at SWA also identified concerns regarding FAA's failure to protect whistleblowers from retaliation. For example, after a whistleblower voiced concerns about SWA to FAA, an anonymous hotline complaint—which was never substantiated—was lodged against him. FAA then removed the whistleblower from duty for 5 months while he was under investigation. In 2007, our work at Northwest Airlines found a similar problem with FAA's handling of an inspector who reported safety concerns. As with the inspector in the SWA case, FAA managers restricted an experienced inspector from performing oversight on the carrier's premises after a complaint from the airline.

Our work at SWA and other carriers has also found weaknesses in FAA's national program for risk-based oversight, ATOS. At SWA, multiple missed ATOS inspections allowed safety directive compliance issues in SWA's maintenance program to go undetected for several years. At the time of the SWA incident, FAA inspectors had not completed 21 key inspections in at least 5 years.

As part of our ongoing ATOS review, we found that FAA oversight offices for seven other major air carriers also missed key ATOS inspections. For example, we found that critical maintenance inspection programs, such as Airworthiness Directive Management, Continuing Analysis and Surveillance (CAS) System, and the Engineering and Major Alterations Program, had been allowed to lapse beyond the 5-year inspection cycle.

Over the past 6 years, we have identified system-wide problems with ATOS, such as inconsistent inspection methods across FAA field offices and incomplete inspections. We recommended, among other things, that FAA strengthen its national oversight and accountability to ensure consistent and timely ATOS inspections. However, FAA still has not fully addressed this concern. We have recommended additional actions to help maintain public confidence in FAA's oversight of air carriers. FAA has agreed to some of these, such as creating a national review team to conduct quality assurance reviews of FAA's air carrier oversight and implementing a process to monitor field office ATOS inspections. However, FAA has not fully addressed other key recommendations, including the following:

- **Periodically rotating supervisory inspectors to ensure reliable and objective air carrier oversight.** FAA has stated that it is not financially feasible to rotate inspectors annually. Given budget constraints, FAA should consider other alternatives to ensure objective oversight. On February 5, FAA advised us that it plans to expand Flight Standards Evaluation Program audits to evaluate the safety culture of field offices and place special emphasis on those offices where the management team has been in place more than 3 years. FAA also stated that the Acting FAA Administrator has published a safety policy to reinforce management's commitment to safety. This policy emphasizes that the United

States public is the primary stakeholder and beneficiary of the FAA safety mission. We will continue monitoring FAA's progress in this area.

- **Establishing an independent organization to investigate safety issues identified by FAA employees.** On December 8, 2008, FAA created a new office within its Office of Chief Counsel to coordinate and provide independent quality control reviews of certain investigations. While this new office is independent from FAA's Aviation Safety line of business, it does not actually conduct investigations of safety issues identified by FAA employees. Rather, recommendations for resolutions of particular safety issues remain the responsibility of the applicable Aviation Safety office. The function of this office is to assess whether investigations and resolutions are fair and in compliance with established processes.

We will continue to monitor the progress and effectiveness of this office as part of our ongoing aviation safety work. Some of our recent work has shown that FAA continues to have problems performing effective, independent reviews of safety allegations. For example, we found that an independent review of FAA oversight activities at one carrier was not comprehensive. In addition, the review team provided the report to the regional office rather than the FAA field office responsible for resolving the problems. We will be reporting on this issue later this year.

Another challenge for FAA will be improving its oversight of new segments of the aircraft industry. A key change occurring in the industry—which is expected to continue over the next 2 decades—is the introduction of very light jets, or VLJs, into the National Airspace System. VLJs are small aircraft with advanced technologies that cost less than other business jets. In 2006, FAA certified the first VLJs, including the Eclipse EA-500. While the industry was generally excited about the introduction of this jet, some FAA employees were also concerned that it was pushed through the certification process too quickly.

A significant issue overshadowing FAA's certification of the EA-500 was the inherent risks associated with a new aircraft utilizing new technology, produced by a new manufacturer, and marketed with a new business model for its use. Because of these factors, FAA should have exercised heightened scrutiny in certifying the aircraft. Instead, our investigation results showed a combination of FAA actions and inactions indicating that the Agency expedited the certification processes for the EA-500 to meet a September 2006 deadline.

More importantly, because the EA-500 has advanced avionics and turbine engine technology typical of large transport aircraft combined with the light weight of smaller, private aircraft, it did not easily fit into FAA's existing certification framework. Therefore, FAA certified the EA-500 and other VLJs using certification requirements for general aviation aircraft rather than the more stringent certification

requirements for larger transport aircraft. However, in a post-design certification, "lessons-learned" internal review of the Eclipse project, FAA managers acknowledged that the general aviation certification requirements were "inadequate to address the advanced concepts introduced on the aircraft." We understand that FAA is developing a Notice of Proposed Rulemaking (NPRM) to clarify certification requirements for VLJs. Given the issues surrounding the EA-500 certification, FAA should expedite the NPRM to allay future concerns with this expanding industry segment.

## Following Through on Longstanding Commitments To Improve FAA Oversight of External Repair Facilities

FAA continues to face challenges in identifying where critical aircraft maintenance is performed. A key issue is that FAA's risk-based oversight system does not include critical repairs performed by non-certificated repair facilities. To address this issue, in April 2007, FAA issued guidance that required inspectors to evaluate air carriers' contract maintenance providers and determine which ones performed critical maintenance and whether they were FAA-certificated repair stations. However, the guidance did not provide effective procedures for inspectors to identify which facilities were FAA-certificated or the type of maintenance each vendor performed for air carriers. Therefore, FAA is now trying to develop a new method to capture these data.

In addition, FAA established a system in FY 2007 for air carriers and repair stations to report the volume of outsourced repairs. However, in September 2008, we reported[9] that FAA's system was inadequate because it did not require (1) mandatory air carrier reporting, (2) an inclusive air carrier listing of *all* repair stations performing repairs to critical components, or (3) FAA inspector validation of the information. Without this information, FAA cannot be assured that it has the information needed to determine where it should focus its inspections. FAA is reevaluating this system in response to our report and expects to implement system improvements by the end of March 2009.

Gathering adequate data to target inspections is important since FAA does not have a specific policy governing when inspectors should initially visit repair stations performing substantial maintenance for air carriers. Instead, FAA allows inspectors to rely on the air carriers' initial audits as a basis for approving those facilities for air carrier use.

As a result, we found significant delays between FAA's initial approval of repair stations and its first inspections at those locations. For example, during a 3-year period, FAA inspectors inspected only 4 of 15 substantial maintenance providers used by 1 air carrier. Among those uninspected was a major foreign engine repair facility

[9] OIG Report Number AV-2008-090, "Air Carriers' Outsourcing of Aircraft Maintenance," September 30, 2008.

that FAA inspectors did not visit until 5 years after it had received approval for carrier use—even though it had worked on 39 of the 53 engines repaired for the air carrier.

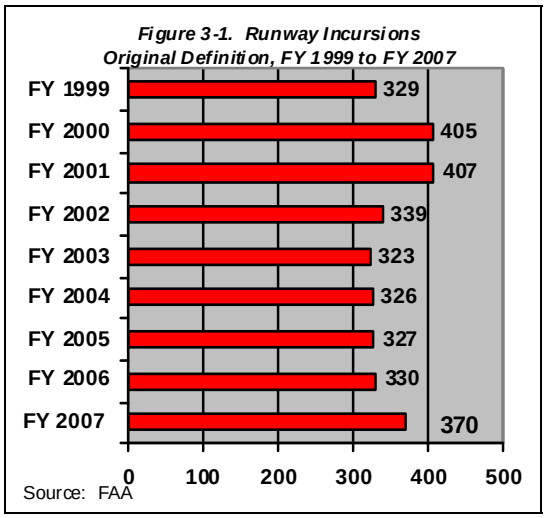
FAA needs to require its inspectors to conduct initial and follow-up on-site inspections, such as major airframe maintenance checks, at substantial maintenance providers to assess whether they are complying with air carriers' procedures. In addition to their own inspections, FAA inspectors must ensure that air carriers and repair stations have strong audit systems to correct identified deficiencies, as FAA relies heavily on air carriers' oversight. In response to our report, FAA is reviewing its procedures for opportunities to strengthen its guidance. However, it does not expect to complete these reviews until mid-2009.

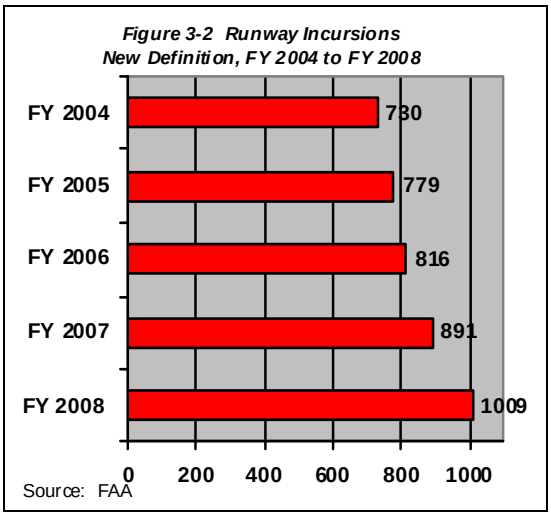
### Improving Runway Safety by Implementing New Technologies, Making Airport-Specific Changes, and Reinvigorating FAA's National Initiatives

Runway incidents continue to be a substantial threat to safety. The December 2008 accident at Denver International, when a Continental 737 veered off the runway into an adjacent field and caught fire during take-off, underscores the seriousness of these incidents. In fact, the last fatal commercial aircraft accident in the United States (in 2006) occurred because the pilots of Comair flight 5191 attempted to take off from the wrong runway.

A specific concern is runway incursions (any incident involving an unauthorized aircraft, vehicle, or person on a runway).[10] Since 2003, the number of runway incursions has begun climbing again, reaching a high of 370 in FY 2007, a 13-percent increase over FY 2004 (see figure 3-1 below). Under FAA's new definition for categorizing runway incursions, the number of runway incursions continues to rise even more dramatically, with a 38-percent increase since FY 2004 (see figure 3-2 below). During FY 2008, 25 serious runway incursions occurred (where a collision was barely avoided); this equates to about 1 serious runway incursion every 15 days.

[10] Effective October 1, 2007, FAA began categorizing runway incursions using the International Civil Aviation Organization (ICAO) definition. The new definition of runway incursions includes incidents that were previously defined by FAA as "surface incidents" (where a potential conflict did not exist).




Many see new technology as a key runway safety solution. However, our reviews of three major FAA technologies[11] for improving runway safety disclosed serious concerns about what can be effectively deployed within the next several years. The uncertain timeline and emerging risks of FAA's runway safety technologies underscore the need for other near-term solutions.

In August 2007, FAA convened a task force that agreed on a short-term plan to improve runway safety. Actions planned include conducting safety reviews at airports based on runway incursion and wrong runway departure data, improving airport signage and markings at the 75 busiest, medium- to large-sized airports, and reviewing cockpit and air traffic clearance procedures. We are currently reviewing the effectiveness of the task force's actions to date.

FAA must also remain focused on reinvigorating national runway safety initiatives. In response to the surge in runway incursions between FY 1999 and FY 2001, FAA took national actions to prioritize runway safety, which resulted in a significant decrease in incidents between 2001 and 2003 (from 407 to 323). However, some national initiatives for promoting runway safety—such as publishing an annual national plan for runway safety with specific goals for each line of business—have subsequently waned as FAA met its overall goals for reducing runway incursions. FAA needs sustained commitment and executive-level attention to renew those types of important Agency initiatives.

As part of its efforts to improve runway safety, FAA also needs to continue to aggressively pursue improvements to Runway Safety Areas (RSA). FAA requires that airports have cleared space around runways to permit safe landings in the event that pilots veer off or undershoot the runway during landings. However, our recent

[11] These three technologies are ASDE-X, ADS-B, and Runway Status Lights.

work shows that 11 large U.S. airports have runways that do not have sufficient space because of major man-made, natural, and environmental challenges.

In addition, more than 40 percent of the RSAs we reviewed have navigational aids (e.g., airport lighting systems) that need to be either modified or relocated outside the RSA. Until these issues are fully addressed, aircraft will remain vulnerable to damage and, more importantly, their passengers will remain at risk of potential injury from accidents on runways with substandard RSAs. We plan on issuing our final results next month.

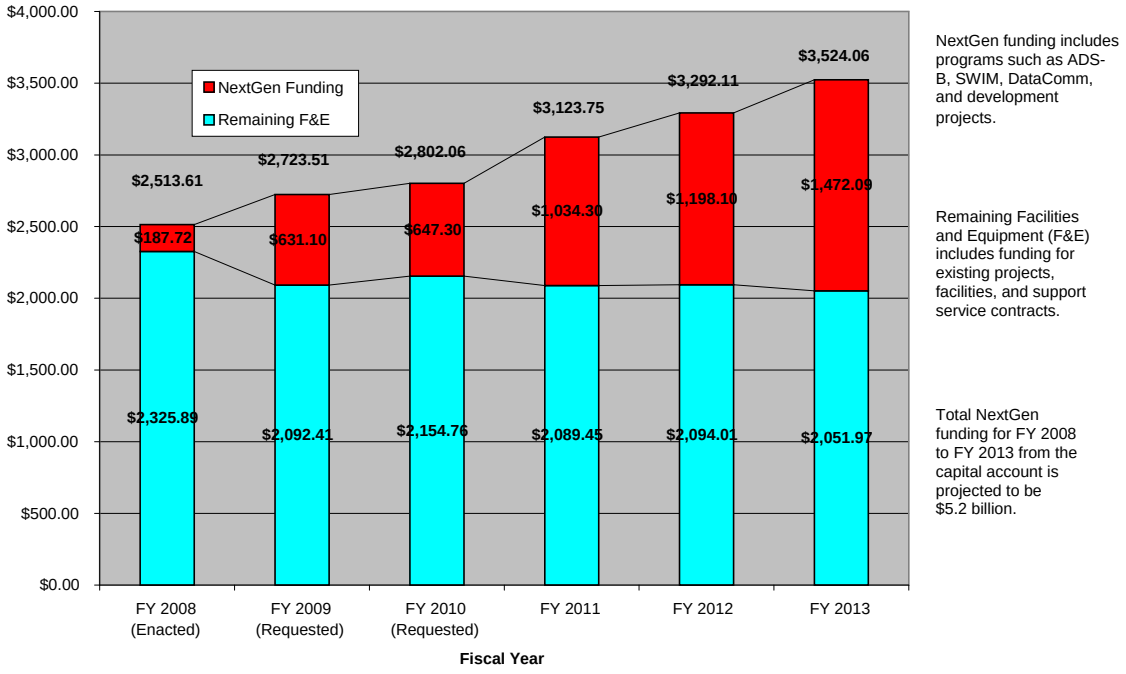
## CHALLENGES FACING FAA IN MODERNIZING THE NATIONAL AIRSPACE SYSTEM AND TRANSITIONING TO NEXTGEN IN THE NEAR AND MID TERM

FAA will be challenged to keep ongoing projects on track, maintain aging facilities, and develop and implement NextGen initiatives. In 2009, FAA plans to spend $2.7 billion for capital funding—an increase of 8 percent over last year's enacted level. FAA is starting a new chapter in modernization with NextGen, and the Agency's capital account is now being shaped by these initiatives. Between FY 2008 and FY 2013, FAA plans to spend $18 billion for capital efforts, including $5.2 billion specifically for NextGen. We note that much of the projected funding for NextGen will focus on developmental efforts, including demonstration projects.[12]

FAA plans to spend more that $630 million in 2009 on NextGen-related programs, which include Automatic Dependent Surveillance-Broadcast (ADS-B) and System-Wide Information Management (SWIM). Figure 4 below illustrates FAA's planned investments in ongoing projects and NextGen initiatives from FY 2008 to FY 2013.

[12] Developmental efforts are funded through the Engineering, Development, Test, and Evaluation portion of the capital account. These efforts are projected to amount to $2.4 billion through FY 2013, which is a significant portion of the amount dedicated to NextGen spending.

***Figure 4. FAA Capital Funding for FY 2008 to FY 2013***
***($ Totals in Millions)***




Source: OIG Analysis of FAA Capital Investment Plan, Detailed Financial Baseline, September 19, 2008.

In addition to capital spending, FAA plans to spend $362 million in research, engineering, and development funds through FY 2013 for NextGen. The projects include air-ground integration, wake turbulence, and environmental research.

## Progress and Problems with FAA Acquisitions

In April 2008, we reported on progress and problems with 18 major FAA acquisitions valued at $17.5 billion. Overall, we are not seeing the significant cost growth and schedule slips with FAA major acquisitions that occurred in the past. This is because FAA has taken a more incremental approach to managing major acquisitions. When comparing revised baselines, only 2 of the 18 projects we reviewed have experienced additional cost growth ($53 million) and delays (5 years) since our last report in 2005.[13] However, from program inception, six programs have experienced cost growth of nearly $4.7 billion and schedule delays of 1 to 12 years.

While FAA's incremental approach may reduce risk in the near term, it has left several programs with no clear end-state and less visibility into how much they will ultimately cost. A case in point involves modernizing facilities that manage traffic in the vicinity of airports, which is commonly referred to as "terminal modernization."

[13] OIG Report Number AV-2005-061, "Status of FAA's Major Acquisitions: Cost Growth and Schedule Delays Continue To Stall Air Traffic Modernization," May 26, 2005.

We are concerned that there is no defined end-state for terminal modernization, and past problems with developing and deploying STARS leave FAA in a difficult position to begin introducing NextGen capabilities. Future terminal modernization costs will be shaped by (1) NextGen requirements, (2) the extent of FAA's terminal facilities consolidation, and (3) the need to replace or sustain existing (legacy) systems that have not been modernized.

### Keeping Existing Systems on Track Is Important as Many Will Provide Platforms for NextGen

According to FAA, approximately 30 existing capital programs will serve as "platforms" for NextGen. For example, the $2.1 billion En Route Automation Modernization (ERAM) program, which provides new hardware and software for facilities that manage high-altitude traffic, is a linchpin for the NextGen system. Because ERAM is expected to serve as a foundation for NextGen, any schedule delays will affect the pace of introducing new capabilities. Currently, ERAM software requirements related to NextGen are still uncertain, but costs are expected to be in the billions of dollars.

Two years ago, in February 2007, we recommended that FAA examine existing projects to determine if they were still needed and, if so, what adjustments would be required.[14] FAA concurred with our recommendation and stated that it had begun this assessment. To date, however, FAA has not made major adjustments to modernization projects to accelerate NextGen.

Over the next 2 years, FAA must make more than 23 critical decisions about ongoing programs. These decisions have significant budget implications and will affect all major lines of the modernization effort with respect to automation, communications, navigation, and surveillance. For example, FAA will have to address what changes are needed to modernize its terminal facilities and whether it will pursue a common automation platform for terminal and en route environments in the future.

### FAA Faces Significant Challenges with Key NextGen Programs

FAA has established initial cost and schedule baselines for the first segments of two key NextGen initiatives: ADS-B and SWIM. Our work shows that both programs face considerable risks and require significant oversight.

**ADS-B:** In August 2007, FAA awarded a service-based contract for the ADS-B ground infrastructure worth $1.8 billion (if all options are exercised). FAA estimates that ADS-B will cost about $1.6 billion in capital costs for initial implementation segments through 2014, including a nationwide ground system for receiving and

[14] OIG Report Number AV-2007-031, "Joint Planning and Development Office: Actions Needed To Reduce Risks With the Next Generation Air Transportation System," February 12, 2007.

broadcasting ADS-B signals. For FY 2009, FAA has requested $300 million in capital costs for ADS-B, its largest acquisition program budget line item.

A key challenge facing FAA—and NextGen implementation—is realizing the full benefits of ADS-B. FAA plans to fully implement *ADS-B Out* in the 2020 timeframe, which will require aircraft to broadcast their position to ground systems. However, most capacity and safety benefits from the new system will come from *ADS-B In*, which will display information in the cockpit for pilots. FAA has not yet finalized requirements for *ADS-B In*.

Our work shows that FAA must address several risks to realize the benefits of ADS-B. These include: (1) gaining stakeholder acceptance and aircraft equipage, (2) addressing broadcast frequency congestion concerns, (3) integrating with existing systems, (4) implementing procedures for separating aircraft, (5) assessing potential security vulnerabilities, and (6) finalizing requirements for *ADS-B In* and new cockpit displays.

Given FAA's history with developing new technologies and its approach to ADS-B, in which the Government will not own the ground infrastructure, this program will require a significant level of oversight. We will report on ADS-B later this year.

**SWIM:** In June 2007, FAA baselined the first 2 years of segment 1 of SWIM (planned to occur between FY 2009 and FY 2010) for $104 million. FAA's latest Capital Investment Plan cost estimate for SWIM is $285 million. We are currently examining the overall status of SWIM and the risks facing a nationwide deployment.

Current challenges include determining requirements and interfaces with other FAA systems, including ERAM and Air Traffic Management programs. Moreover, FAA must integrate SWIM with other Federal agencies' operations to realize NextGen benefits and develop a robust cyber security strategy and design.

We found that FAA is pursuing SWIM in a decentralized way and providing other programs with funds to develop interfaces with the system. FAA still needs to establish the architecture, strategy, and overall design for SWIM. FAA has yet to determine additional segments and the cost to fully implement the program.

## FAA Must Refine the Mid-Term NextGen Architecture

Last April, we recommended—and FAA concurred—that FAA conduct a "gap analysis" of the current National Airspace System and the vastly different NextGen system and develop an interim architecture for the 2015 timeframe. These actions would help highlight transition issues and establish requirements that could be used to develop reliable cost and schedule parameters for NextGen. FAA is focusing considerable attention on mid-term goals for NextGen, which are planned for the

2018 timeframe. However, we found that FAA needs to address fundamental issues with three key elements to achieve these goals.

- **NextGen Implementation Plan:** FAA's January 2009 plan[15] provides a framework for what NextGen will resemble in 2018 and reflects the need to link FAA and stakeholder investments. However, FAA and stakeholders point out that the plan does not yet reflect a consensus on how to move forward, and much work is required to set priorities, quantify expected benefits, address integration issues, and clarify time and location of equipment needs. In addition, the plan will need to illustrate the operational, regulatory, policy, and procedural issues that need to be resolved to implement NextGen capabilities. Also, stakeholders point out that the plan does not yet clearly assign responsibility, authority, or accountability for mid-term initiatives.

- **Gap Analysis of the Current and NextGen Systems:** This effort is important because FAA intends to rely on existing automation systems to provide the basis for NextGen through the mid-term phase of the effort. A key question focuses on the most cost-effective way to implement changes for displays and computers that controllers use to manage traffic in the vicinity of airports. FAA is conducting this gap analysis, and Agency officials expect to complete the effort this summer.

- **NextGen Mid-Term Architecture:** FAA has made progress in developing components of a general blueprint for the 2018 timeframe. It has also developed "road maps" for automation, communication, navigation, and surveillance efforts. FAA's current blueprint highlights more than 340 key decisions that FAA must make to reach the envisioned mid-point NextGen architecture. However, FAA has not yet established firm requirements that can be used to develop the cost and schedule estimates for modifications to existing programs or new acquisitions. FAA's documents caution that ground systems continue to be developed from the bottom up, which results in mission and performance gaps. Further, air and ground elements are not yet synchronized, and FAA must determine which trade-offs to make regarding which capabilities will reside in aircraft versus FAA ground systems. FAA officials told us they expect to complete these efforts later this summer.

To help chart a course for NextGen in 2018, FAA tasked RTCA (a joint Government/industry forum)[16] to forge a community-wide consensus on what should be implemented and what actions will be needed to realize benefits. The RTCA task force has an ambitious agenda; it is expected to make recommendations to FAA and help the Agency prioritize efforts, frame the business case for new systems (for FAA

[15] FAA's *NextGen Implementation Plan*, January 30, 2009.

[16] Organized in 1935 as the Radio Technical Commission for Aeronautics, RTCA, Inc. is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. It functions as a Federal Advisory Committee.

and airspace users), and define the necessary actions to achieve benefits in 2018. The task force plans to complete its work this summer.

## NextGen Implementation Presents Congress with Important Policy Questions

NextGen planning documents call for users to equip with a range of new avionics including ADS-B, data link for communications for controllers and pilots, and new navigation equipment. Stakeholders argued that $4 billion of stimulus funds should be used to equip aircraft and accelerate NextGen efforts, including $2 billion specifically for ADS-B.

As stakeholders point out, there is a precedent for helping airspace users equip specifically with ADS-B avionics. FAA purchased ADS-B avionics for operators in Alaska as part of the Capstone initiative.[17] This provided a base of properly equipped aircraft and allowed FAA to examine the costs and benefits of the new technology.

In a recent report[18] on implementing ADS-B, stakeholders noted that incentives for ADS-B deployment could take a number of forms. These include purchasing equipment for operators, an investment tax credit, an adjustment to current excise taxes for ADS-B-equipped aircraft, or research and development tax credits specifically for avionics manufacturers. However, FAA has never managed such a large effort to equip aircraft in the continental United States.

Whether or not such incentives should be used is clearly a policy decision for Congress. A clear understanding of exactly what the incentives would be used for is needed. This is important because FAA has not finalized the requirements for key capabilities, such as *ADS-B In*. In our opinion, a full consideration of the strengths and weaknesses of various incentives as well their timing and potential impact is important. Further, FAA could use incentives to demonstrate and refine NextGen capabilities and provide detailed information on how to certify equipment, such as new cockpit displays.

## Sustaining FAA's Vast Network of Aging Facilities

A key cost driver for NextGen is determining to what extent FAA realigns or consolidates air traffic control facilities. This has significant cost implications for the number of controller displays and related computer equipment needed to manage

[17] The Capstone Project was a joint industry and FAA research and development effort to improve aviation safety and efficiency in Alaska. Under Capstone, FAA provided avionics equipment for aircraft and the supporting ground infrastructure. The Capstone Project operated from 1999 to 2006, and its success in Alaska laid the groundwork for the nationwide deployment of ADS-B.

[18] Report from the ADS-B Aviation Rulemaking Committee to the Federal Aviation Administration, "Recommendations on Federal Aviation Administration Notice No. 7–15, *Automatic Dependent Surveillance—Broadcast (ADS–B) Out* Performance Requirements to Support Air Traffic Control (ATC) Service; Notice of Proposed Rulemaking," September 26, 2008.

traffic in the vicinity of airports. In our December 2008 report,[19] we found that many FAA air traffic control facilities have exceeded their useful lives, and their physical condition continues to deteriorate. In some cases, facilities deteriorated so badly that they required urgent and repeated actions. While the average facility has an expected useful life of approximately 25 to 30 years, 59 percent of FAA facilities are over 30 years old (see table 2).

***Table 2. Average Age of FAA Facilities***

| Type of Facilities | Average Age |
|---|---|
| Air Traffic Control Towers | 29 years |
| Terminal Radar Approach Control Facilities | 26 years |
| En Route Control Centers | 43 years |

Source: FAA

FAA points out that flexible ground communication networks do not require facilities to be near the traffic they manage. FAA often cites its aging facilities and the related expense of maintaining such a large number of facilities to justify consolidating the air traffic control system into a smaller number of facilities. However, there are technical and security prerequisites for major consolidation, such as implementing new "voice switching" technology to allow for more flexible communication and enhanced automation. FAA's 2007 reauthorization proposal called for a "Realignment and Consolidation of Aviation Facilities Commission" to conduct an independent review and make recommendations to the President. Last year, the House and Senate reauthorization proposals (H.R. 2881 and S. 1300) also recognized the issue of consolidation and the need for further examination.

FAA plans to spend $17 million in FY 2009 to examine various alternatives for revamping its facilities. FAA should ensure that this analysis clearly addresses the technological and security prerequisites as well as key cost drivers, benefits, and logistical concerns associated with consolidations so decision makers in Congress and the Administration will know what can be reasonably accomplished. This is a critical action item because until key, strategic decisions are made regarding consolidations, FAA will be unable to define its long-term funding requirements for the management and maintenance of its air traffic control facilities.

## FAA Actions Needed To Help Focus Mid-Term NextGen Efforts and Shift from Planning to Implementation

We have made numerous recommendations to FAA to help it move forward with NextGen. These include developing an interim architecture, assessing the skill mix with respect to necessary systems integration and contracting, and focusing human

[19] OIG Report Number AV-2009-012, "FAA's Management and Maintenance of Air Traffic Control Facilities," December 15, 2008.

factors research to ensure concepts can be safely implemented. At this time, FAA must move beyond planning and shift to implementation. To do so, FAA needs to take the following actions:

- **Complete the gap analysis of the current and NextGen systems as promised and refine the NextGen mid-term architecture.** These two efforts are important because FAA intends to rely on existing automation systems to provide the basis for NextGen through the mid-term phase of the effort. Until FAA establishes the detailed changes needed to transition to NextGen, it will be difficult to determine requirements that can be used to develop reliable cost and schedule estimates to achieve NextGen's mid-term goals.

- **Establish priorities and Agency commitments with stakeholders and reflect them in budget requests.** It remains difficult for decision makers to determine what to invest in first from the wide range of operational improvements in NextGen planning documents. Stakeholders have asked for a clear articulation of the timing, location, and assignment of responsibility for NextGen capabilities. This past year, FAA has worked to shape priorities. However, the Agency must do more and work with stakeholders to identify the proper sequencing of efforts. Also, stakeholders have asked FAA to clearly state mid-term Agency and operator commitments in its NextGen Implementation Plan. FAA should continually work to provide this Subcommittee with a clear understanding of its NextGen priorities and commitments and reflect them in budgets and plans.

- **Manage mid-term initiatives as portfolios and establish clear lines of responsibility, authority, and accountability for NextGen efforts.** FAA must manage NextGen capabilities as portfolios because several systems, new procedures, and airspace changes funded through different accounts will be required to deliver benefits. FAA is developing various portfolios and understands the need to manage them in an integrated fashion. However, as an FAA study points out, FAA's Acquisition Management System was not designed for managing NextGen investments.[20] Rather, FAA's system focuses on baselines and specific capital programs—not a collection of investments. FAA recognizes that it must modify its system to effectively manage NextGen efforts. FAA could also strengthen its NextGen Implementation Plan by clearly assigning responsibility, authority, and accountability for specific NextGen portfolios.

- **Focus attention on the relief that various NextGen technologies can provide to already congested airports in major metropolitan areas, like New York and Chicago.** An important metric for NextGen is to what extent FAA can improve *airport arrival rates* under various weather conditions. FAA recognizes the importance of this and is shifting resources to this issue. However, FAA's efforts to

[20] "Independent Assessment of FAA Acquisition Management System," April 22, 2008.

examine "high-density operations" are in the very early stages, and planning documents and budget requests thus far do not detail how individual NextGen systems can specifically boost airport capacity and reduce delays. Decision makers and stakeholders need to know what elements—ADS-B, new routes, and data link communications for controllers and pilots—are essential to improve capacity at already congested airports.

- **Acquire the necessary skill mix to effectively manage and execute NextGen.** In response to our February 2007 report, FAA commissioned the National Academy of Public Administration to assess the skill sets needed for NextGen. In a September 2008 report, the Academy identified 26 competencies where FAA lacks both capacity and capabilities to accomplish NextGen implementation.[21] These include experience in large-scale systems acquisition and integration. FAA has identified an additional 175 staff positions that it plans to fill in 2009 and another 162 positions for 2010 to address identified skill requirements.

- **Develop a realistic plan for implementing ADS-B and realizing the air-to-air benefits of the new technology.** FAA has a contract in place for ADS-B and has published an NPRM. The NPRM calls for users to equip with *ADS-B Out* in the 2020 timeframe. FAA has received comments from 177 organizations or individuals about the details of the NPRM. While most agree that ADS-B is an important part of the future, some raised concerns about requirements, the cost of equipage, and lack of clear benefits—all legitimate issues that will need to be resolved. To clarify these issues, FAA must expedite efforts to establish requirements for *ADS-B In* and cockpit displays.

- **Assess "implementation bandwidth" and develop transition benchmarks.** FAA's ability to implement multiple capabilities in a given time period needs to be assessed. There are limits to what can be accomplished given the scope of change envisioned and ongoing efforts. For example, FAA has staggered key NextGen capabilities, such as data link communications, to wait for the completion of ERAM in the 2012 timeframe. Further, FAA and industry need realistic transition benchmarks that point to when new training (for controllers and pilots), equipment (new avionics and ground systems), and procedures need to be in place at specific locations.

[21] Report by a panel of the National Academy of Public Administration, "Identifying the Workforce to Respond to a National Imperative - The Next Generation Air Transportation System (NextGen)," September 2008.

## BOLSTERING KEY FAA SAFETY WORKFORCES

FAA continues to face significant attrition in two of its most critical safety workforces: air traffic controllers and aviation safety inspectors. Over the next decade, FAA must maintain enough professionals with the right skill mix to ensure the safe and efficient operations of the National Airspace System. Key challenges for FAA include the following:

- Hiring and training the next generation of air traffic controllers.
- Addressing controller human factors.
- Ensuring a sufficient number of appropriately placed safety inspectors to address a divergent aviation environment.

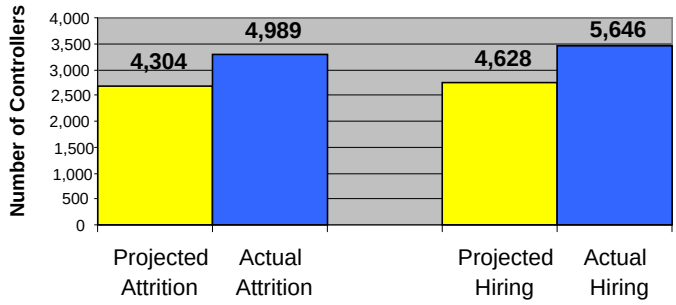
### Hiring and Training the Next Generation of Air Traffic Controllers

Over the next decade, FAA plans to hire and train nearly 17,000 controllers to replace those who were hired after the 1981 strike and are now retiring. Ensuring there are enough certified controllers at FAA's more than 300 air traffic control facilities will remain a significant watch item for the Department and Congress. Since 2005, 4,989 controllers have left the workforce (2,657 of these were retirees). The total rate of attrition for FY 2005 through FY 2008 was 16 percent higher than FAA had projected.

However, we note that for FY 2008 retirements were below FAA's projection for the first time since FAA began projecting retirements in 2004 (781 actual versus 809 projected).

FAA has accelerated its hiring efforts to keep pace with attrition. Since 2005, FAA has hired 5,646 new controllers—22 percent more than projected (see figure 5).

***Figure 5. Controller Attrition and Hiring, Projected and Actual (FY 2005 – FY 2008)***




With the surge in new hires over the last 4 years, FAA is facing a fundamental transformation in the composition of its controller workforce. While the overall size of the controller workforce remained relatively constant from April 2004 to September 2008, the number of controllers in training increased by nearly 72 percent, while the number of fully Certified Professional Controllers (CPC) decreased by nearly 11 percent (see table 3 below).

***Table 3. Controller Workforce Composition***

| Date | CPCs | Controllers in Training* | Total |
|---|---|---|---|
| **April 2004** | 12,328 | 2,209 | 14,537 |
| **September 2008** | 11,007 | 3,800 | 14,807 |
| **Difference** | (-1,321) | +1,591 | +270 |

*We chose 2004 as a benchmark for comparison purposes since 2004 was the last year we audited this program and because 2004 was the year FAA first published its Controller Workforce Plan.

Controllers in training now represent nearly 26 percent of the workforce (up from 15 percent in 2004). However, that percentage can vary extensively by location—from as little as zero percent (e.g., Pittsburgh air traffic control tower) to as much as 47 percent (e.g., Orlando International air traffic control tower).

A major challenge in addressing controller attrition will be training new controllers to the CPC level at their assigned locations. In June 2008, we issued our second report on FAA's controller facility training program since 2004.[22] FAA is taking actions at the national level to get this important program on track. For example, FAA is adding more training simulators at towers and increasing use of contractor training support—from 53 facilities in 2004 to 190 facilities in 2007. Many of FAA's efforts, however, are still in the early stages.

Our June 2008 report identified problems that we also found in 2004—that the facility training program continues to be extremely decentralized and the efficiency and quality of the training varies extensively from one location to another. We recommended the following actions to FAA, and FAA concurred:

- Establish realistic standards for how many developmental controllers facilities can accommodate.
- Ensure the standards developed address individual facilities' training capacity.
- Continue to encourage veteran controllers to transfer to busier, higher-level facilities.
- Implement key initiatives FAA first proposed in 2004 to improve facility training.

In September 2008, FAA made a significant change to its training program by awarding a 10-year, $437 million contract to the Raytheon Technical Services Company (Raytheon) to support the Agency's training of newly hired and existing air traffic controllers. The contract calls for Raytheon to provide training support at both

[22] OIG Report Number AV 2008-055, "Review of the Air Traffic Controller Facility Training Program," June 5, 2008.

the FAA Academy in Oklahoma City, Oklahoma, and at air traffic facilities nationwide.

According to the contractor, the new program, known as the Air Traffic Controller Optimum Training Solution (ATCOTS), will modernize the training process by utilizing up-to-date technologies to train controllers, adjusting the training curriculum, and introducing a modeling and simulation tool that will predict training and staffing bottlenecks, thus allowing FAA to be more proactive in solving workforce training issues.

Given the importance of this new contract, Chairman Costello has requested that we review the ATCOTS training program, including the financial and contractual aspects of the program. Specifically, we will examine how the training program will differ from what is currently provided to the controller workforce and whether adjustments to the program and contract during its early stages are warranted. We plan to begin this review next month.

## Addressing Controller Human Factors

As attrition increases, FAA must also continue addressing controller human factor issues (fatigue and attention). Congress has expressed concerns regarding controller human factor issues since the influx of new controllers will need both technical and human factors training. For example, in April 2003, we reported that almost 90 percent of controller operational errors (when a controller allows two aircraft to get too close together either on the runway or in the air) were due to human factors issues rather than procedural or equipment deficiencies.[23] Since our review, FAA has made progress with a training program designed to sharpen and maintain controllers' mental skills most closely associated with visual attention and scanning: the National Air Traffic Professionalism Program.

However, FAA also needs to continue focusing on training controllers about fatigue. In its investigation of Comair flight 5191, the National Transportation Safety Board (NTSB) expressed concerns that the lone controller on duty at the time of the accident had only slept about 2 hours before his shift (although he had 8 hours off between shifts). As a result of its investigation, the NTSB added controller fatigue to its "Most Wanted List" in 2007.

At the request of Senator Durbin of Illinois, we are reviewing factors that could affect controller fatigue at Chicago O'Hare Tower, Chicago TRACON, and Chicago Center. So far, we have identified several potential fatigue factors. These include scheduling practices with minimal time between shifts, conducting on-the-job training, working 6-day weeks (overtime), and working an operational position for extended periods of time. We are working to determine the extent to which these factors are occurring

[23] OIG Report Number AV-2003-040, "Operational Errors and Runway Incursions," April 3, 2003.

and what efforts FAA is taking to address them. We plan to issue our results this spring.

At the request of Chairman Costello, we are also reviewing the rate and causes of controller training failures (developmental controllers who fail training either at the FAA Academy or at their assigned facility). FAA reports that the overall training failure rate for FY 2007 was about 10 percent of all trainees. However, this rate includes both newly hired controllers as well as veteran controllers transferring to new locations. Given the huge surge in *new* controllers, those metrics should be tracked separately so FAA can measure its progress in training newly hired controllers. We also found that data used by FAA to compile the training failure rate were inaccurate, with some facilities not entering information into FAA's tracking system for months at a time. We plan to issue those results this spring as well.

## Ensuring a Sufficient Number of Appropriately Placed Safety Inspectors To Address a Divergent Aviation Environment

Effective oversight by FAA safety inspectors is vital to ensuring that the industry continues its impressive safety record. As shown in table 4, this oversight covers a vast network of operators and functions, which make up the largest, most complex aviation system in the world (see table 4).

***Table 4. FAA Inspectors' Workload***

| | | | | |
|---|---|---|---|---|
| Major Air Carriers | 116 | | Flight Instructors | 92,207 |
| Repair Stations | 4,957 | | FAA Designee Representatives | 6,100 |
| Active Pilots | 722,208 | | Aircraft | 319,549 |
| Approved Manufacturers | 1,647 | | FAA licensed Mechanics and Repairmen | 363,217 |

Source: FAA Aviation Safety Workforce Plan as of March 2008

FAA's approximately 4,100 inspectors must oversee both domestic and foreign aspects of these operations. This task is made more difficult by the rapidly changing aviation environment. One issue that warrants attention is FAA's ability to develop and implement a reliable staffing model to ensure it has a sufficient number of inspectors where they are most needed.

In past years, FAA has made at least two attempts to develop a staffing model to determine the number of inspectors needed and the best locations for placement. Neither model, however, provided FAA with an effective approach for allocating inspector resources.

At the direction of Congress, the National Research Council evaluated FAA's current methods for allocating inspector resources in September 2006.[24] This study reported similar concerns that we identified in past reports—that FAA's current method of allocating inspectors is antiquated and must be redesigned to effectively target inspectors to those areas of higher risk.

The Council also reported that the changing U.S. and global aviation environments will be key drivers of future inspector staffing needs. For example, airlines' outsourcing of aircraft maintenance, FAA's shift to a system safety oversight approach, and safety inspectors' attrition and retirement are all important factors that must be considered in determining staffing needs.

It has been over 2 years since the National Research Council study, and FAA has still not implemented the new staffing model. However, FAA is developing the new model and plans to begin using it by October 2009. Last year, FAA's hiring efforts kept pace with retirements, and FAA ended the year with 121 inspectors over its FY 2007 levels. However, nearly half of the workforce will be eligible to retire within the next 5 years. It is not reasonable to expect FAA to have an inspection workforce that is large enough to oversee every aspect of aviation operations; therefore, making measurable progress toward a new staffing model is a key watch item, and we will continue to monitor this important initiative.

## FINANCING FUTURE AIRPORT DEVELOPMENT

### Delays in Airport Improvement Program Grants Could Impact Airports' Ability To Enhance Safety, Maintain Infrastructure, and Expand Capacity

In the coming months, Congress and aviation stakeholders will discuss important questions about FAA's reauthorization. Because Vision 100 expired at the end of FY 2007, and a long-term reauthorization is not yet in place, funding targets do not exist for FY 2009 and beyond. Congress is now faced with the challenge of determining AIP funding levels for FY 2010.

The AIP supports the airport system by providing funds to primarily enhance safety and security, maintain the infrastructure, increase capacity, and mitigate airport noise in surrounding communities. AIP authorized funding has steadily increased over the last 9 years. Since 2001, the AIP has been authorized at $3.2 billion or higher each year. In FY 2008, through a series of continuing resolutions, Congress provided FAA with $3.5 billion in AIP funding. For FY 2009, as part of a continuing resolution, Congress provided FAA with $1.5 billion in AIP funding but did not extend the AIP contract or obligation authority to issue new AIP grants beyond March 6, 2009. Unless further funding is provided before March 6, FAA will no longer have the contract authority to issue new AIP grants.

[24] National Research Council Study: *Staffing Standards for Aviation Safety Inspectors*, September 20, 2006.

Aviation congestion continues to be a top priority for the Secretary. However, it is increasingly difficult for airports and FAA to meet this challenge with no AIP authorization. The uncertainty of future AIP grant authority makes it difficult for the Nation's airports to determine when, or if, they will receive their AIP grants.

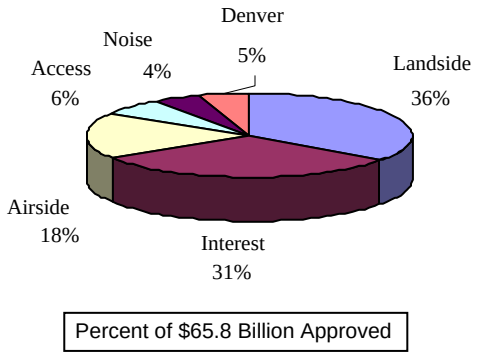
Smaller airports are more vulnerable because they have fewer revenue sources than large airports. Many smaller airports must suspend projects until they are assured of AIP grant funds. Lengthy delays in the release of AIP grants could prevent airports from taking full advantage of the construction season and delay important safety and capacity projects that could reduce congestion in the busy travel season ahead.

## Passenger Facility Charge Collections Are Declining

In addition to AIP funds, passenger facility charges (PFC) have become an important funding mechanism for airports. Between 1992 and 2008, FAA approved the collection of $65.8 billion in PFCs. Of this amount, airports have collected an estimated $27.6 billion, with another $2.9 billion anticipated for 2009. In comparison, airports received about $42.1 billion in AIP grants between 1992 and 2008.

Overall, airports anticipate using PFC collections to finance landside projects (e.g., terminals, security, and land), bond interest payments, airside projects (e.g., runways, taxiways, and equipment), access roadways, noise abatement, and the Denver International Airport (see figure 6).[25]

***Figure 6. Approved PFC Uses by CYs 1992 to 2008***




However, volatile fuel prices and a softening economy have led to airline service reductions and capacity cuts, which have caused declines in passenger traffic. This, in turn, has led to the decline in the stream of PFC revenues, which could inhibit future airport development.

Specifically, when airports experience reductions in passenger traffic, PFC collections automatically decline. PFCs are a source of funding that airports largely depend on to finance capital improvement projects that are generally ineligible to receive AIP funds (such as terminal improvements). For example, at one medium-hub airport we visited, PFCs declined by 22 percent (or about $7.1 million) during 2008 when

[25] FAA tracks Denver's PFC separately due to its large size and because it was used to fund the new airport, not specific projects.

compared to the same period in 2007. This was due to airlines either going out of business or ceasing operations. Without a steady stream of PFCs or other revenue options to offset the loss of PFCs (e.g., increase airlines rates and charges), some airports will find it increasingly difficult to keep capital projects' milestones and costs on track.

Currently, PFCs are capped at $4.50 per segment of flight (a maximum of $18.00 on a round trip). The current cap on PFCs is an important matter for this Subcommittee and has significant implications for major airports' capital expenditure plans. In fact, Chicago O'Hare International Airport anticipates future increases in the cap as part of its financing plans for the O'Hare Modernization Program, a multi-year, multi-phased program with an estimated cost of $6.6 billion (in 2001 dollars).

The FAA Reauthorization Act of 2007, as passed by the House (H. R. 2881), would have increased the PFC ceiling to $7.00 per trip segment. Airport associations support this increase in the PFC ceiling. However, one airline association has stated its concern that approval for airport improvement projects, especially those funded through the PFC program, does not provide airlines with a meaningful role in those critical decisions. Determining how future airport projects are funded and what the levels of AIP funding and PFC charges should be are important issues as the Congress decides how best to finance FAA.

## Unstable Financial Markets Have Made It Difficult for Airports To Issue Airport Bonds

Proceeds from issuing airport bonds are used to finance runways, taxiways, and other airport facilities that benefit airport users and the public. According to the Airports Council International, airport bonds represent the largest funding mechanism for airport development and many are backed in part by PFCs. Also, according to a major investors' service, debt backed solely by a pledge of PFCs is of particular concern, because the supporting revenues are directly tied to enplanement levels and cannot easily be adjusted by rate increases when volume falls.[26]

The unstable financial markets have made it difficult for airports to issue airport bonds. Consequently, airports are being forced to either postpone key development projects or find other sources of short-term financing as an interim fix to keep projects moving. One airport announced that its $1.68 billion project to build a new international terminal could be suspended unless it is able to sell $600 million in bonds.

## The Stimulus Package Presents Oversight Challenges for FAA

The economic stimulus packages proposed in the House and Senate contain significant funding amounts for the AIP that will help to revitalize airport

[26] Moody's U.S. Public Finance, "2008 U.S. Airport Sector Outlook: Six Month Update," August 2008.

development this year and next year. However, such a large infusion of new funds could create significant oversight challenges for FAA. For example, there will be pressure to begin projects quickly, and FAA and the Department will have to balance this pressure against the need to continually emphasize safety. It is critical that FAA prepare for the potential risks involved and ensure steps are underway to mitigate them.

Mr. Chairman, as part of our recently announced Department-wide review of oversight challenges associated with economic stimulus funding for transportation projects, I can assure you that my office will be working with the Department to identify risks, oversight challenges, and best practices associated with the stimulus funding for the AIP.

That concludes my statement, Mr. Chairman. I would be happy to answer any questions you or other Members of the Subcommittee may have.